The KSU Department of Grain Science and Industry Celebrates Its Centennial

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Honoring Our Past

The roots of the Department of Grain Science and Industry at Kansas State University (KSU) reach back to a corner of a chemistry laboratory in old Denison Hall (1902–1934). It was there that, in 1905, J. T. Willard, head of the Department of Chemistry, installed an experimental mill to begin evaluating the milling quality of new strains of hard winter wheat being developed for Kansas and the Great Plains.

By 1910, the work had grown and culminated into the establishment of the Department of Milling Industry. Funding for the new department was solicited by the director of the Kansas Agricultural Experiment Station from millers and wheat growers throughout the state. Funds ultimately were provided by the Kansas millers (who raised nearly $2,000), the Kansas City Board of Trade, and the Kansas City millers. Total funds raised were $2,382.

Leslie O. Fitz, a 1902 KSU graduate involved in wheat quality work for the USDA, was hired to head the new department. Goals of the department were to promote the use and improve the quality and handling of Turkey-type wheats, as well as to conduct research on those topics and grain storage methods. Under Fitz’s direction, plans were made for the construction of a large experimental mill as well as the construction of special machinery. In 1913, the state legislature appropriated $7,500 for mill equipment. The machinery was installed in Agriculture Hall (now East Waters Hall), when it was constructed in 1913, and was placed in operation in January 1914. The mill had a capacity of approximately 145 cwt per 24 hours.

Fitz resigned in 1922, and C. O. Swanson assumed the position as department head in July 1923. Swanson had been associated with KSU since 1906 when he was named an assistant chemist by the Experiment Station. He had been primarily involved with research on the composition and properties of wheat flour. Under Swanson’s leadership, the department became recognized throughout the nation as a leader in wheat and milling research.

In 1937, a basic four-year course for students in milling industry was developed, and the old major in flour mill engineering was dropped. Courses were added until students were permitted to specialize in milling administration, technology, or chemistry.

Swanson retired as department head in 1939 and was succeeded by E. G. Bayfield who remained as head of the department until the end of June 1945. Facilities of the department were not impressive when John A. Shellenberger became department head in September 1945.

Equipment in the laboratories and the pilot mill was outdated and inadequate. As a result of a chance tour led by Shellenberger for John W. Cain, president of the Midland Flour Milling Company, Kansas City, MO, U.S.A., the Millers’ Advisory Commit-
tee was formed. At the first committee meeting in July 1947, the group agreed to modernize the pilot mill.

Ultimately, the state legislature appropriated $10,000 for new equipment, and a number of milling companies also made donations to modernize the mill. When the remodeling was finished in 1948, a total of $80,000 had been spent on the project.

At the request of the feed industry, the feed technology curriculum was added to the department in 1951. Plans were drawn for the formula feed industry to raise $250,000 to build a structure to house a feed mill and other needed facilities. The Feed Technology Building was dedicated on November 10, 1955. Final cost for the structure was $331,000. More than 275 firms contributed cash, equipment, or services.

On August 25, 1957, East Waters Hall, home of the department, was struck by fire. Despite efforts by fire departments from campus and the cities of Manhattan and Fort Riley, all that remained of the building was a gutted ruin. Replacement cost was estimated at $1,500,000.

After the fire, faculty members were moved to the central section of Waters Hall, Dickens Hall, and the attic of Willard Hall. Salvageable equipment was stored in the judging pavilion of Weber Hall and in World War II barracks.

A committee, appointed by the governor, to investigate the fire recommended that the pilot plant never again be located in Waters Hall. As a result, plans were made for a new building to join the Feed Technology Building. Plans also were made to rehabilitate East Waters Hall, mainly for use by the Agronomy Department, but space also was to be included for classrooms for milling and feed technology students.

The new building, constructed and furnished with state funds and money raised by the Millers’ Advisory Committee, cost about $700,000, but with the cost of equipment, the total was well over $1 million. It was dedicated as the Milling Technology Building on May 18, 1961, by Secretary of Agriculture Orville L. Freeman.

From 1960 to 1962, a new extension program was developed for the commercial feed industry under the leadership of Robert W. Schoeff. The program was approved by the university administration, and two positions were funded by the state legislature.

At the suggestion of the Southern Bakers Association, and with the approval of the Kansas Board of Regents, the bakery science curriculum was established at KSU in 1963. The program allowed students to select a major in bakery science specializing in one of three options: administration, operations, or chemistry.

Shellenberger retired in 1966, and William J. Hoover became head of the department. That same year, the department’s name was changed to the Department of Grain Science and Industry. Later in 1966, the Food and Feed Grain Institute was established to allow interdisciplinary research activities that would bring together expertise from throughout the entire university to address problems of food and feed grains throughout the world.

In 1970, the state legislature appropriated $100,000 to finance an expansion for the third floor of the building, but funds were insufficient. The final result was the addition of one third-floor classroom and a general laboratory.

Hoover resigned in 1976 to become president of the American Institute of Baking, which had moved from Chicago to Manhattan with his encouragement. Charles W. Deyoe was then named head of the department.

Under Deyoe’s direction and with the support of the Kansas Wheat, Corn, Sorghum, and Soybean Commissions, the International Grains Program (IGP) was established in 1978 to provide support for the marketing of U.S. grains. The program provides short courses and seminars on U.S. grains for international grain buyers and processors, as well as assistance to other countries with milling, feed, grain, or baking problems.

In 1980, the desperate need for facilities for participants in IGP courses was recognized and funds were obtained for remodeling an area in the sub-basement of Waters Hall. The Kansas Wheat Commission provided funds for a much-needed classroom, while state funds provided for a small conference room, preparation room, and office in that area.

That same year, construction of a 10,000-square-foot addition to complete the third floor of Shellenberger Hall was approved by the Kansas Board of Regents. However, in funding the project, the legislature specified that funds for construction of the addition must come equally from state and the milling, baking, feed, and allied industries. Ultimately, the state provided $750,000 for the addition, and industry financed the remainder of the $1.6 million of building and equipment, which was dedicated in June 1984.

When Throckmorton Hall opened in 1981, the Department of Agronomy moved most of its activities to that new building, freeing space in Waters Annex. With funding from the legislature, some 3,000 square feet were remodeled to provide space for a large classroom, grain grading laboratory, office, and preparation room. The area, named the IGP Center, was dedicated in December 1983.

On July 1, 1992, Deyoe stepped down as department head, although continuing as acting head of the department until a new department head was found. He remained as director of the IGP and a professor in the department. Richard R. Hahn took over the department head’s role in November 1992 after serving as the first director of the Kansas Value Added Center.

Hahn served as head until his retirement in 1996, at which time Brendan J. Donnelly became head. Donnelly perceived the need for redirecting some departmental activities and for upgrading
the physical facilities. With the encouragement of the department faculty and university administration, he promoted the concept for a set of five new buildings to be located north of Kimball Avenue, across from the football stadium, on the site of the department’s grain storage research facility.

The new Grain Science and Industry complex is now under construction. The IGP Conference Center, funded by the state commodity commissions, was completed in 2004. The Biological and Industrial Value Added Programs (BIVAP) Building was built with state funds and completed in 2004. The Hal Ross Flour Mill, funded by the milling industry, was the third building in the complex, dedicated October 20, 2006. The mill will also host the Bühler Western Hemisphere Milling School. A research and teaching feed mill is in the planning stage, anticipating industry funding, and the fifth and last building in the present plans will house classrooms, research laboratories, offices, and the Baking Program. It is anticipated to be financed by a combination of federal and state funding.

Undergraduate enrollments in the department peaked at more than 200 in 1998, but state budget shortfalls almost immediately began to affect the department, resulting in the nonreplacement of retiring and departing faculty, declining student numbers, reduction in research projects, and slacking of recruitment efforts. The introduction of a phased-in retirement program for some senior faculty further reduced the recruiting and research activities. Faculty and support staff positions and enrollment both began to fall, resulting in a low of 120 undergraduates (50 in milling, 45 in baking, and 25 in feed) in 2004.

Donnelly retired in 2004, and Virgil Smail was hired as the department head. Smail had previously been the director of the USDA Grain Marketing and Production Research Center and then the president of the American Institute of Baking, both in Manhattan, so he was quite familiar with the industry and institutions in Kansas. He continued the policy of expanding department facilities as well as rebuilding the faculty and support staff and immediately began efforts to increase enrollments.

Following Smail’s resignation to enter industry in 2007, Hahn returned from his retirement for a year as interim department head while a national search was conducted for a permanent fill. Dirk Maier, from Purdue University, was hired in 2008 and serves as the current head.

By the Spring 2010 semester, the department consisted of 19 full-time and five emeritus part-time faculty involved in teaching, research, and extension, and an additional three professionals in the International Grains Program, as well as numerous visiting scientists and research assistants/associates. Undergraduate enrollment was 179 students, majoring in baking (59), milling (81), or feed (39) science and management. Additionally, 45 students were enrolled in the graduate programs pursuing M.S. (21) or Ph.D. (24) degrees in cereal science.

The IGP program brings many international short-course participants to campus and provides information on grain marketing and grain processing and utilization to an international audience.

The KSU Wheat Quality Laboratory was a descendent of the many years of research conducted in this department, often in conjunction with the USDA laboratory, and in service to the wheat breeders in the hard winter wheat growing area, including Kansas, Oklahoma, and Nebraska, with some additional cooperation with other states and areas. One of their major activities has been evaluating the wheat samples collected during the annually conducted “crop survey” in the area at harvest time. This data is made available to potential grain buyers as well as plant breeders. It was operated by the Grain Science Department in the early 1990s, expanded to temporary facilities in the USDA laboratory in 1993, and then moved into permanent quarters in the newly remodeled and expanded Throckmorton Hall in 1994, where it could be more convenient to the plant breeding program.

Department research covers a broad range of topics in cereal chemistry, grain storage, processing, and utilization. It involves both applied and basic research, and results in a number of patents and publications.

What does the future hold for the department? The $13 million O. H. Kruse Feed Mill, a Research and Teaching Building, and curriculum and research expansion into value-added products and bioprocessing. But even as we expand our mission and extend into related areas, the department is still as heavily involved in wheat quality work as it was back in 1910. As former professor Arlin Ward liked to say, “It’s pretty hard to buy a cereal product that hasn’t been touched by a K-State Wildcat.”

The Centennial Celebration

On October 1–2, 2010, the Department of Grain Science and Industry at KSU celebrated its centennial, recognizing 100 years of progress and contributions to the cereal grains field, career preparation, basic science developments, and contributions to the industry. They also looked to the future with planned new construction. The event followed many months of preparation, and began with a scholarship fund golf tournament on Friday, October 1.

It continued with an all-day series of activities on October 2, which began with tours of the Shellenberger Hall facilities on the main campus and the new IGP Conference Center, Ross Flour Mill, and BIVAP Building on the new campus site on Kimball Avenue. Following a luncheon, Roger Johnson, retired associate director of IGP, presented a fascinating report on the early U.S. wheat sales to the former USSR, and the part that then department head, Shellenberger, played in the operation.

To balance the “look back,” six Grain Science and Industry Department faculty presented papers on their current research. There were also 22 research posters displayed by departmental faculty and their graduate students, as well as exhibits by the Kansas Wheat and Soybean Commissions.

During the afternoon and evening, nine former department faculty members were each recognized with the department’s Centennial Career Achievement Award for their contributions, narrated with a video slide show, and presented with a glass plaque. Deyoe, former head and IGP director, was honored by naming the IGP Auditorium for him, and Ward, former milling instructor and instigator of the activities, which led to the creation
Don DuBois, a 1942 KSU graduate, was the earliest alum to attend the centennial celebration.

Roger Johnson and his wife Linda just before he presented his keynote address, “Dr. Shellenberger and the Russian Wheat Deal,” on October 2, 2010, during the Grain Science Department Centennial Celebration Symposium.

of the IGP, was honored by having the IGP Board Room named for him. In addition, Schoeff was honored for his contributions to grain elevator safety education, which drastically reduced the number and severity of grain dust explosions.

Paul Seib was recognized for his contributions to carbohydrate research, including many successful patents. Carl Hoseney was recognized for his many cereal science contributions, including the popular textbook published by AACC International, now in its third edition. Karl Finney was remembered for his meticulous research with the Mixograph and for developing procedures which changed test baking from an art to a science and led to the training of many new cereal scientists. Okkyung Kim Chung was recognized for her lipid research, her international activities on behalf of the AACC Intl., including starting the AACC Intl. Student Travel Fund, and for helping many young cereal scientists.

Shellenberger, the former department head for whom the present main department building is named, was remembered for his many successful activities in inspiring and leading the effort to restore the department after the disastrous August 1957 fire, and for his building a department with an international reputation. Hoover was remembered for his leadership in international activities, securing funding to expand the building, and renaming the department and defining its three undergraduate majors, milling, feed, and bakery science and management, and its M.S. and Ph.D. degrees in grain science.

A formal groundbreaking for the fourth (out of five planned) building for the site was held in the late afternoon. The $13 million O. H. Kruse Feed Mill and BioRefinery Teaching and Research Facility will replace the old main department building and greatly expand the department’s scholarship fund. The evening saw many old friends renewing acquaintances. The oldest returning alum honor went to Don DuBois, now 90 years old, and a 1942 graduate of the department.

The highlights of the evening included the distribution of a 75-page souvenir book documenting the history of the department, and the recognition of Sosland Publishing Co. for producing it and for contributing $15,000 from the proceeds to the department’s scholarship fund.

The event was quite successful in keeping with the theme: Honoring our past; envisioning our future.

Acknowledgments

Material for the history portion of this article was based upon an earlier publication “How It Came To Be” by the KSU Department of Grain Science and Industry. That information, in turn, drew heavily upon three unpublished papers by John Shellenberger. Furthermore, the success of the celebration activities are a credit to the contributions by many people, including current department head Maier for his leading inspiration, the faculty who organized the symposium and presented papers, and the many staff members and students who assisted in countless ways. A special thanks to Courtney Fowler who organized and orchestrated most of the highly successful event activities.

Photo Key—Front Panel (L to R and Top to Bottom):

Richard Hahn, former department head, greets Bob Bequette who was completing his M.S. degree at the time of the 1957 fire and was responsible for saving much of the department’s records.

The first three department heads (L to R): Leslie Fitz (1910–1922), E. G. Bayfield (1939–1945), and C. O. Swanson (1923–1939).

Paul Seib with an experimental product made by extruding wheat starch. (Photo courtesy of Gloria and Bob Holcombe.)

Old Denison Hall at KSU in which the present Department of Grain Science and Industry had its 1905 antecedents in a small flour mill installed in a chemistry laboratory. That work led to the formal establishment of a separate department in 1910. Denison Hall was destroyed by fire in 1934, after the department had moved to Agriculture Hall (present East Waters Hall). (Photo Courtesy of Kansas State College Press.)

Nuclear defense school participants at work. This department conducted short courses on how to decontaminate flour milling equipment.

David Wetzel presented a Centennial Career Achievement Award to O. K. Chung, a graduate of the department and past AACC Intl. president.

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