

6 | EXTENSION PROGRAMS

The University extension service was in a downsizing mode through the 1980s and 90s, as federal funds from the Smith-Lever act continued to decline. Downsizing came in two ways. Often, retiring extension staff members were not replaced. In addition, faculty remaining on the extension staff had official appointments shifted to include more teaching and/or research. By 2009, the ABE department had only three faculty members with partial extension appointments, i.e., Bob Aherin, Ted Funk and Richard Cooke. The reduction in extension faculty members led to changes in how the extension program was conducted. Some subject matter areas were simply dropped. Some academic professionals were employed to assist the remaining faculty members. Also, scheduling of face-to-face meetings with producer groups declined. Instead, extension faculty began concentrating on developing extension teaching materials for delivery by extension educators or via electronic media. The extension program conducted between 1997 and 2009 is described in the paragraphs below, broken out by subject matter area.

Farm Machinery

John Siemens served on a research and extension appointment until his retirement in 1999. His research was closely linked to his extension

activities. His three major thrusts were on machinery management, tillage and soil compaction.

Maintaining a set of farm machinery is a major cost in agricultural production. Choosing machines that are too large results in unnecessary expense, while choosing undersized machinery can result in expensive crop losses. Siemens and his graduate students developed computer software that calculated the optimum sizes of farm machines for any given farm. The software considered the probability of good working days in scheduling farm operations that could be completed in a timely manner. The software selected a compatible set of machinery such that, for example, the tractor or tractors were capable of handling the machines to which they were connected. Siemens brought the software to the attention of Illinois farmers through his extension program. Deere and Company also made use of the software to help their customers choose equipment.

In 1981, the Illinois Department of Agriculture set a T-2000 goal, i.e., to achieve a tolerable level of soil erosion loss by the year 2000. The tolerable level was an annual loss of up to five tons per acre, the theoretical rate at which soil can be replaced by natural processes. Siemens experimented with a variety of tillage practices aimed at reducing soil erosion. The results were brought to the attention of Illinois farmers through Siemens' extension program, including exhibits at the annual Agronomy Days on the South Farms. A major part of achieving T-2000 was retiring the moldboard plow. Chisel plowing and other reduced-tillage operations came into practice as a way to leave crop residues at the ground surface to resist erosion. Siemens' activities led to him being selected to receive the ASABE John Deere Gold Medal award in 1999. Since John Deere came into prominence for inventing the self-scouring moldboard plow, it was ironic that Siemens won the John Deere Gold Medal for helping to retire the moldboard plow.

With the growth in the size of farm tractors, concern arose in Illinois as to the effect of wheel traffic on soil compaction. Siemens began research to study the effect of tractors on soil compaction. His studies showed that soil compaction can reduce crop yields, especially in wet years when compaction caused drainage to be inadequate. Siemens brought the research results to the attention of Illinois farmers through his extension program, including exhibits at the annual Agronomy Days on the South Farms.

When Siemens retired in 1999, Shufeng Han was hired to fill the vacant position and to establish a program in precision agriculture. Use of yield monitors and other precision agriculture technology was growing rapidly and Han's objective was to help producers learn how to use the new technology. After only two years on the faculty, Han was lured away by Deere and Company to work on precision agriculture. Due to budget shortfalls, the department was not permitted to fill the position and it was lost. That position loss ended the department's extension activities in the farm machinery area.

Pesticide Application

The Department has maintained a prominent state and regional educational program regarding the technology for applying pesticides and fertilizers since the 1960's. Wendell Bowers, John Siemens, and Loren Bode provided the leadership for this outreach effort throughout the years. The greatest changes in the application of agricultural chemicals since the mid 1990's included the use of electronics such as variable rate control and automatic swath control, and the introduction of new nozzle designs for the reduction of spray drift. The ABE extension staff worked with pesticide applicators in the adoption of the new technology.

The ABE department cooperated with other departments in the College of ACES in providing education to farmers and commercial applicators on best practices for the efficient and safe use of pesticides. Training clinics were provided to enable applicators to meet certification requirements of the state as well as USEPA. Loren Bode provided leadership for the application and equipment segment of the certification and training program from 1973 until his retirement. Several pesticide application specialists also assisted in providing the educational clinics for both commercial and private applicators. These included Steve Pearson, Bob Wolf, and Mark Mohr. At time of writing, Scott Bretthauer was handling the pesticide application program for the department. Steve Pearson became Vice President for International Sales with Spraying Systems Company, Bob Wolf became a Professor in the ABE Department at Kansas State University, and Mark Mohr began leading the spray nozzle group at the Hypro Pump Division. The entire Pesticide Education Safety Program (PSEP) including the salaries of the specialists is self-supporting with income from training clinics,

training materials, and state and federal grants. Annual expenditures for the PSEP program now exceed one-half million dollars.

A variety of venues are used to provide the education regarding the safe and effective use of pesticides. Typically, these include presentations at the annual Agronomy Day at the South Farms, a Spray School held on campus each January, and a training circuit at approximately thirty locations throughout Illinois. At each location on the circuit, a team consisting of specialists from ABE, Crop Sciences, and NRES delivers educational modules for specific categories of commercial operators and applicators. Following the training, representatives of the Illinois Department of Agriculture administer exams to the participants that, if passed, would allow those in attendance to become certified applicators.

Bode and/or his assistants also conducted fly-in clinics at various locations in Illinois as well as other states. Aerial applicators brought their spray planes to these clinics for calibration and analysis of the spray distribution pattern. Each plane flew passes over a collection system aligned across the runway. The results were analyzed and produced a summary of the spray pattern and droplet size distribution. Any needed changes in nozzles, spray pressure spray height, etc., could be made based on the pattern and additional passes flown for verification. The fly-in clinics have significantly improved the aerial application of pesticide not only in Illinois but throughout the mid-west.

Farm safety and health

Bob Aherin served on a research and extension appointment. Chip Petrea was supported on grant funds. Together, they did research that fed into their numerous extension activities on farm safety.

The goal of the disabled farmers' project was to develop a model program for providing comprehensive assistance to Illinois farmers with physical disabilities. Research established the need for such assistance among farmers.

A project was conducted to empower communities to identify agricultural safety and health issues of concern and to advance appropriate intervention programs. The project was set up in six demonstration counties in Illinois. Two major medical centers served as a regional project sponsor. Strategies were developed to support the continuation of the project within the community.

Chip Petrea, Bob Aherin and Phil Buriak participated in the Illinois Easter Seal Society's TASK (Teaching Agricultural Safety to Kids) program. The TASK strategy was to train FFA students to make presentations on agricultural safety and health issues to elementary school students. The ABE participants observed and evaluated the training received by the FFA students, then evaluated the immediate and one-year impacts of the TASK presentations to the elementary students.

With support from the Centers for Disease Control and Prevention, Petrea and cooperators from outside the ABE department mounted a program to reduce eye injuries and illnesses in Latino farm workers. The goal was to determine the intentions and prominent beliefs of the workers towards the prevention strategies currently being utilized and then develop an intervention program based on those intentions and beliefs. By building a partnership among university researchers, advocacy groups, Latino farm workers and local health care professionals, a long-term eye injury and illness prevention program was established.

Aherin and Petrea participated in an effort by Illinois agricultural safety proponents to design and produce a retro-reflective marking system to improve the visibility of farm equipment on public roads. The product was called FARM (Fewer Accidents with Reflective Material) kit. Aherin and Petrea conducted a survey that found that 61% of those surveyed were familiar with FARM kit.

The National Farm Children's Center for Agricultural Health and Safety and the Carle Foundation Center for Rural Health and Farm Safety sponsored a project by Aherin and his cooperators to provide farm safety training to rural youth aged 6 to 13, including a number of Amish youth. A Farm Safety Mobile was equipped with training modules, then transported to rural communities for presentation to the youth. The project was evaluated as to impact and behavior change.

Chip Petrea assisted the Board of Directors of the National Institute for Farm Safety by serving as their administrative secretary. His duties included writing minutes of board meetings and assisting with communications between board members, institute members and with outside entities.

Processing

The processing group, led by Steve Eckhoff, conducted wet milling

short courses as part of the outreach program of the department. The purpose of the courses was described as “To provide fundamental understanding of the corn wet milling process, equipment, unit operations and industry trends for representatives of the wet milling and allied industries. The course is ideal for corn wet millers, equipment vendors, enzyme companies, trade organizations and companies allied with the corn processing industry.” The teaching faculty for the short courses included Steve Eckhoff, Kent Rausch, Marvin Paulsen, Mike Tumbleson and Vijay Singh, plus selected experts from off campus. Typical topics included drying, handling and storage of corn, kernel structure, composition and chemistry and numerous other topics relevant to corn wet milling. At least six such short courses were conducted over the years, including one held in January, 2009.

The processing group also held starch technology conferences, beginning in 1999 and repeated at two year intervals. Typically the conferences were held at off-campus sites in Champaign/Urbana, starting on a Sunday and concluding on a Wednesday. Speakers included departmental faculty members as well as people employed in industry and government. In addition to oral presentation of papers, poster sessions were held. A conference proceedings was published after each conference. While the conferences all related to starch technology, the special focus changed from conference to conference. For example, the June 2007 conference focus was on energy issues.

Livestock

The ABE department has a long history of conducting extension activities for the Illinois livestock industry. Art Muehling did extensive extension work for the Illinois swine industry until his retirement in 1992. After Muehling’s retirement, Ted Funk moved from the Effingham area Extension office and joined the ABE faculty to continue the livestock extension work at the state level. He was joined in August 1997 by Randy Fonner, an academic professional. The primary focus of their work was to help Illinois livestock producers cope with state regulations regarding livestock wastes. These regulations were part of the Management Facilities Act passed by the Illinois legislature on My 21, 1996. One of the requirements of the new act was that livestock facilities with over 300 animal units (for example, 750 finishing hogs,

214 dairy cows or 300 beef feeders) were required to have at least one person certified in waste management. At the time of passage of the act, Illinois had an estimated 2,500 livestock operations subject to the act. Fonner was hired specifically to coordinate the new state-mandated training program, called the Certified Livestock Manager Training (CLMT), for livestock producers. The CLMT program developed by ABE was later adapted and adopted by other states and national organizations.

Three Illinois agencies each had different requirements regarding livestock wastes. These are the Illinois Department of Agriculture (IDOA), the Natural Resources Conservation Service (NRCS) and the Illinois Environmental Protection Agency (IEPA). Funk and Fonner worked with representatives of the three organizations in developing a manure management plan handbook for Illinois livestock producers. Producers used the handbook to develop plans and document that their livestock waste handling procedures would be in compliance with the regulations of the IDOA and the IEPA, and the plan suggestions of NRCS. Wastes included animal manure, wastewater, and carcasses of animals that died on the farm.

A primary goal of the livestock waste regulations was to keep excessive plant nutrients, especially nitrogen and phosphorus, from entering surface waters of the state. Thus, the workbook prepared by Funk and Fonner helped producers estimate the quantity and composition of the manure based on the age, size and number of each animal species on the farm. The workbook also helped document details of manure storage and the spreading of manure on the land such that the nutrients applied would not exceed the rate at which the crop could use them. The workbook also helped producers document that manure and wastewater would not be able to be carried to streams by rainfall runoff. The workbook also helped producers document how animals that died during production would be handled, for example, by composting.

Funk and Fonner communicated with producers in a variety of ways. The workbook was made available to producers by posting it on the world-wide web and by releasing it on a CD-ROM. Funk and/or Fonner also attended numerous conferences, with regulatory agencies to prepare for the writing of the workbook and also with producers to assist them in complying with the regulations. The first series of 15 statewide training sessions took place in March through July of 1997

and 2,350 farmers, consultants and others were trained. The CLM certification program requires each facility to send a management-level person for training every three years, so the program provided an opportunity for the BEE group to regularly impact the Illinois livestock industry.

Another continuing BEE extension programs included a biannual Livestock Manure Management Conference for farmers, agencies and educators. The BEE group also conducted a statewide human housing program emphasizing indoor air quality issues and human health, including radon mitigation, mold cleanup and home energy conservation.

Soil and Water

Soil and Water extension programs continued to include soil erosion control and drainage topics, but also increasingly emphasized water quality. Michael Hirschi continued to lead the Soil and Water extension effort until he accepted the position of Assistant Dean – Undergraduate Programs, College of Engineering in 2007. His extension activities included Water Quality Program Coordinator, University of Illinois Extension; Leader, Water Quality Strategic Research Initiative, Illinois Council on Food and Agricultural Research; and Technical Advisor, Conservation Technology Information Center, West Lafayette, IN. He was a member and leader of several extension education teams including the Natural Resources Management Program Team, which coordinated statewide education and professional development efforts in natural resource management and the Water Quality Publications Team that developed and produced materials for water quality outreach.

Hirschi's educational program expanded from erosion and sedimentation to the larger area of water quality because fertilizer and pesticide contaminants in both surface and groundwater became a national priority. Hirschi created innovative ways to educate farmers, and homeowners about ways contamination occurs and how they can improve the quality of our nation's water supply. Of major importance was a series of award winning publications entitled "This Land". This series proved to be a particularly effective means of communicating with extension clientele. Interest in the "This Land" series has been high as evidenced by the fact that the initial monograph, "50 Ways Farmers Can Protect Their Groundwater" is in its second printing. The sec-

ond monograph, “57 Ways You can Protect Your Home Environment”, is oriented to the consumer/homeowner and has increased general public awareness of water quality. Both monographs have won technical (ASAE) and communication (AAAC) awards. A third monograph, “60 Ways Farmers Can Protect Surface Water” is also receiving wide acceptance and use among extension educators. A measure of the impact of this series is that they are available in book stores in addition to normal extension outlets. Hirschi has consistently provided tillage/erosion or water quality presentations at county and regional meetings as requested; totaling 209 presentations since 1990.

Hirschi gradually accepted more teaching responsibilities and some extension activities were picked up by other faculty. As noted in “Agricultural Engineering on the Prairie: Illinois Style” the Department has had a close association with the Illinois Land Improvement Contractors Association (ILICA) since its beginnings when Prof. Hay assisted in the initial organization. The aim of the Association is to encourage high standards of workmanship in resource management, land improvement practices and to promote private enterprises in land improvement contracting.

Kent Mitchell served as educational advisor to ILICA from 1996 to 2003. He immediately became involved in coordinating, planning and construction of ponds by ILICA for the University Arboretum, which was a gift-in-kind valued at \$600,000 at that time. ILICA offered annual workshops which were organized by Mitchell in cooperation with the Jim Evans, State Engineer, NRCS. Also, semi-annual “Conservation Expos” were offered at various locations in the state with Extension and NRCS personnel assisting. In 2003, ILICA initiated a certification program that is a testing and continuing education program that seeks to recognize proficiency and professionalism in the land improvement field and upgrade the status of land improvement contractors. ILICA offers five classifications of certification: erosion control, earth-moving, drainage, drainage water management, and septic. Mitchell helped begin this certification program and continues as the certification testing administrator; which requires attendance at workshops to remain current on subjects the ILICA members are learning.

Richard Cooke initially joined the department on a research and teaching appointment, but an extension component was added in 2004. Following one of Cooke’s presentations in Bloomington, Illinois,

in 2004, agronomist Bob Hoeft suggested to Bob Easter, ACES Dean, that “The College needs to get Richard Cooke on an extension appointment, as he does a great job of delivering the message on water management.” Cooke used his extension appointment to feed research results to farmers and contractors in Illinois. Cooke became the Education Advisor to ILICA in 2003 and has worked closely with that organization. Paired research/demonstration sites were established at 18 places in Illinois, one site as a control and the other implementing some conservation drainage practice. One practice was to install structures to regulate tile flow as a way to reduce nutrient (especially nitrates and phosphorous) flow into rivers and lakes and also to regulate the water table height to benefit crop growth. Another project was to map the location of drainage tiles in Illinois by using image analysis software to analyze aerial images of fields. In addition to working with ILICA, Cooke delivered his research results through some direct meetings with farmers, through presentations at drainage and crop workshops throughout the state and at Agronomy Days at the South Farms. In 2007 he initiated a series of four one-day Basic Drainage workshops in different sections of the state, and was the main instructor at a two-day Advanced Drainage workshop, patterned after the Overholt Drainage School in Ohio. He updated and improved the Illinois Drainage Guide and developed it for on-line access. This improvement enables all users to easily access the design information to develop appropriate drainage systems and allows farmers to calculate the costs and benefits of tile drainage on their own farms.

ABE Extension Affiliates

In 2000, each extension educator out in the state was given the opportunity to affiliate with the department of his/her choice on a zero-time appointment. Five extension educators chose to affiliate with the ABE department. These were George Czapar of the Springfield office, Robert Frazee and Stanley Solomon of the East Peoria office, Michael Plumer of the Carbondale office and Duane Friend of the Jacksonville office. The Jacksonville office is a satellite of the Springfield office. Frazee, Friend and Plumer worked in the area of natural resource management. Czapar worked on pest management and Solomon worked on engineering technology.