C-FAR Members Benefit from Engagement in Statewide Partnership

The Illinois Council on Food and Agricultural Research (C-FAR) is an unprecedented partnership among the State of Illinois, producers, consumers, researchers, and other professionals throughout Illinois. Comprising representatives from a broad range of industry sectors, C-FAR puts forth one voice for Illinois food, agricultural, and related research. This coalition of dedicated individuals is the backbone of the C-FAR organization. “Our membership has consistently demonstrated remarkable support. Their engagement has truly moved us forward across every front, of which we are extremely proud,” said Larry Fischer, C-FAR membership chair.

Through their engagement, C-FAR members receive many benefits. C-FAR members are able to

Be directly engaged in helping establish research priorities for Illinois
Engagement of members through the organization’s five working groups provides the foundation of C-FAR. Members share their insights, unique perspectives, and professional experiences to identify research needs of the food, agricultural, and related sectors as a whole. This interaction helps guide Illinois’ publicly funded research programs and related outreach efforts to ensure that the most important needs of the state are being addressed.

Interact and share ideas with other stakeholders and researchers
C-FAR members, often from diverse interests and backgrounds, gain knowledge and understanding as they interact and share ideas with other industry professionals and researchers. Though membership meetings, working group sessions, and educational research forums, members discuss concerns and opportunities worthy of investigation in order to strengthen and advance the state’s food, agricultural, and related systems.

Receive information on C-FAR membership and research program activities
C-FAR members directly receive a wide range of information and communications. From annual reports and newsletters to final reports on research initiatives, members receive materials that keeps them up-to-date on C-FAR membership and research program activities.

Learn about new programs and technologies
Through their engagement in C-FAR, members learn about new programs and technologies that may benefit them or their associates. C-FAR-funded research has developed new educational and training programs that are reaching millions of people throughout the state. It has also contributed to the development of new programs that are assisting producers in growing value-added crops, connecting Illinois livestock producers with local grocers to provide high-quality meat products to consumers, and training food service personnel on food safety practices, just.

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Greetings

THE C-FAR PARTNERSHIP: DELIVERING RESULTS

During the recent legislative session, there were many meaningful inquiries regarding the C-FAR appropriation’s importance, its role in our state’s food and agricultural research programs, and so forth. We appreciated these inquiries of interest as they further brought to light a multitude of important elements we can all be proud of.

This edition of C-FAR Connection highlights two such elements—examples of research outcomes that have reached commercialization, and how the C-FAR appropriation is leveraged. We, of course, share this type of information routinely in various publications and at our meetings. However, we sought additional updates from researchers and assembled this information into two new documents. I referenced these documents, which can be viewed on our website, in one of my monthly updates this past spring.

The examples included in this newsletter, as well as all C-FAR-funded research outcomes and leveraging, have not become reality by accident. A carefully considered research portfolio resulted in these high-impact outcomes coming to fruition. The C-FAR partners—from the State of Illinois, which appropriated these critical funds, to the C-FAR membership who helped set priorities and guide the research portfolio, to the researchers who carried out sound research—each made integral contributions. Much like a 3-legged stool, it would not have been possible to achieve these accomplishments if any of the legs (partners) had been absent.

I encourage you to review the highly successful examples included in this newsletter. As you do so, be proud of the difference you are making as a C-FAR partner and supporter.

Statewide Partnership

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to name a few. Members are also kept abreast of new technologies as well as those on the horizon, such as biomass energy and wind turbine technologies currently under development to provide Illinois with renewable clean energy sources.

Develop valuable networks with other professionals

Through their engagement in C-FAR, members meet professionals from their own and from other fields of interest. Valuable professional relationships and collaborations often result through these interactions.

Be a part of a unique and meaningful coalition

Members can share a sense of immense pride in being part of such a unique organization. C-FAR meaningfully engages Illinois citizens in the strengthening of the state’s food, agricultural, and related sectors in a collaborative effort that was previously non-existent. C-FAR has gained national recognition through its success as a premier public–private partnership, and it serves as a model for a similar national effort. The diverse and volunteer membership on which C-FAR is built ensure a high level of integrity in serving the public good.

“I have never before experienced anything like C-FAR. The dynamics of the human interactions and engagements are tremendous,” said Alan Puzey, C-FAR chairman. “The most important result of this broad-based partnership is the meaningful research outcomes that are benefiting Illinois and every Illinois citizen.”
C-FAR Research Investments
Generate Large Returns for Illinois

State investments in C-FAR-directed food, agricultural and related research have strengthened Illinois’ top industry, boosted the state’s economy, and improved the health and wellbeing of Illinois citizens since the first C-FAR appropriation in FY96. A wide range of new technologies, programs, and resources have been developed, and great advancements have been made in the areas of food safety and nutrition, natural resource protection, crop and livestock production, biotechnology, information systems and technology, rural community development, value-added and alternative agriculture, horticulture, and more.

“Research is often exploratory by nature,” said Nels Kasey, C-FAR research chair. “We are very confident that by engaging the private sector in publicly funded research, the opportunities increase dramatically for going from exploratory endeavors to tangible public benefits. The following examples of public benefits point not only to the excellent work of our state’s scientists, but also to the value of our unique private-public partnership.”

C-FAR RESEARCH YIELDS HIGH-IMPACT OUTCOMES

C-FAR research investments are unique in that they are guided by Illinois citizens, via the C-FAR membership, to ensure that the most critical research needs of the food, agriculture and related industries are met. The following are just a few examples of C-FAR-funded research outcomes that either have been commercialized or have otherwise positively impacted the people of Illinois.

Food safety programs prevent foodborne illness in Illinois—Hazard Analysis Critical Control Point (HACCP) training programs, food safety curriculums, and public service announcements continue to educate food service personnel and the general public on safe food handling. More than 1,000 Illinois food service professionals and 150 local environmental health specialists have been trained in HACCP procedures. HACCP programs have also been developed for small meat processing facilities and farms. Day care centers, school meal programs, university-dining services, long-term care facilities, hospitals, restaurants, catering, deli operations, and correctional systems are currently participating in the implementation of HACCP programs. Foodborne illnesses affect more than 3,200 Illinois residents annually, who must seek medical attention.

Partnerships boost producer income and provide high-quality meat products to consumers—New marketing resources and networks are helping Illinois livestock producers boost their income and better meet consumer demand by providing a greater selection of meat products. One example is the Premium Beef Project, which is linking Chicago independent grocers (including Blue Goose Supermarket, Sunset Foods, and Hyde Park Coop) with downstate beef producers. These grocers are able to better serve their customers by providing high-quality beef products, marketed under the Illinois Crown Beef label, while also providing them with peace of mind in knowing the origin of the meat.

Rural development initiative generates economic impact over $150 million—A five-year strategic research initiative that focused on rural community development in Illinois has resulted in a combined economic impact on sales, payroll, capital investment and leveraged project dollars of over $150 million. This includes 88 new or expanded value-added agricultural enterprises, 457 new jobs, $18 million in new annual payroll, $45 million in value-added sales increases, $6 million in new capital investment, and $3.3 million in leveraged project dollars.

Value-added agriculture expansion adds $42 million to farm income—Illinois farmers are increasing their farm income through new opportunities to produce and market value-added farm products. The Central Illinois Grain Alliance in Woodford County, Illi-Mex Alliance, LLC, in Christian County, and Midwest Prairie Products, LLC, in Bureau County were established and received assistance in securing USDA grants to carry out feasibility studies for specific enterprises. Site visits were organized for Japanese firms to meet with Illinois producer groups and firms. Since 1999, it is estimated that value-added crop production expansion has increased Illinois farm income by $42 million.

PARTNERSHIPS FORMED AMONG ILLINOIS LIVESTOCK PRODUCERS AND CHICAGO’S INDEPENDENT GROCERS ARE PROVIDING HIGH-QUALITY MEAT PRODUCTS TO CONSUMERS.

C-FAR research provides scientific basis for water quality standards—The Illinois Environmental Protection Agency developed a plan to adopt water quality standards for nutrient-related parameters that protect against measurable impacts to the aquatic environment that can be caused by nutrient over-enrichment. The plan states the utilization of C-FAR-funded research as a scientific basis for criteria development. This plan was approved by the U.S. Environmental Protection Agency in August 2003.

Over 43,000 students learn the importance of food safety—A program
developed for elementary students focuses on the importance of food safety. C-FAR, the Chicago Tribune, the Illinois Restaurant Association, GOJO, the Illinois State Board of Education, the Illinois Department of Public Health, and Western Illinois University are supporting this effort. Over 43,000 students in 1,400 4th- through 6th-grade classrooms located in and around Chicago participated in this program, which helped the students learn to apply food safety concepts and information to their everyday lives.

**Soy foods center promotes increased health and crop production**—The Illinois Center for Soy Foods promotes the consumption of soy foods, thereby providing benefits to soybean growers, processors, and consumers in Illinois. The center addresses soy product development, soy consumer acceptance, soy processing technology transfer, and soy education and outreach. A high-energy, nutrient-dense nutrition bar has been developed and is intended to be used around the world as a “first response” food during crises caused by natural disaster or war.

**Swine research spins off new company and 15 patents**—Research in transgenics, stem cell, and microfluidics in swine has generated 15 patents. A startup company, Vitae, LLC., which has received support from the U.S. Department of Agriculture and the National Institutes of Health has licensed the technology.

**Non-thermal food processing technique commercialized**—A non-thermal microbial inactivation technique using high-pressure processing was developed and is being used commercially. The first two high-pressure processed products (guacamole and oysters) are now available in the U.S. market.

**Livestock and urban waste recycling techniques protect environment and yield value-added compost products**—Innovative technologies are being used to recycle livestock and urban waste into value-added compost. Fifteen compost sites are either currently in development or already in production across Illinois, from Lake County to Effingham County. Three new compost products have been branded and are being marketed, including Sweet Earth, which is approved by the Illinois EPA, and which can be produced and marketed by any farmer who meets product specifications.

**Corn production technology generates higher yields and reduction in fertilizer inputs**—Ten percent higher corn yield during drought conditions and increased feed value during good rainfall years are now being realized through new corn production technology. Fertilizer requirements are also reduced, which results in less fertilizer runoff into surrounding water supplies. This technology has been licensed by Garst Seed Company, and Monsanto has developed a transgene version of the invention.

**Millions of consumers and producers benefit from an array of online information systems**—Comprehensive Web-based information systems have been developed, and they are assisting Illinois consumers and producers. The Nutrition Analysis Tool at www.nat.uiuc.edu helps Illinois citizens make more informed food choices. The website receives over one million hits per month. FARM.DOC at www.farmdoc.uiuc.edu offers farmers and other agricultural decision-makers comprehensive risk- and business-management tools. That website averages 150,000 requests per month.

**Swine odor and waste technologies reach commercial trial**—New management systems and technologies have been developed to support an environmentally sustainable, socially acceptable, and economically viable swine industry in Illinois. Odor and manure management technologies using anaerobic digestion, dedusters/wet scrubbers, and composting systems have been developed, and they are being transferred to commercial application. Various computer-based models are now available to aid producers and others in decisions regarding siting of facilities and odor and manure management.

**Wool producers market value-added products**—The Illinois Value-Added Wool Producers, Inc. cooperative was formed to develop and market products manufactured from Illinois wool. Illinois lamb and wool producers are enhancing the value of their wool and identifying new markets to boost their industry with assistance in product feasibility, new product development, and marketing.

**Horse breeders save dollars with new uterine infection treatment**—Researchers have developed a way to prevent and cure uterine infections in mares that is less expensive, faster, safer, and more effective than the usual approach of prescribing antibiotics. A mannose-based solution is being used to flush out disease-causing bacteria (mannose is a plant sugar). Lost
production due to uterine infections costs the U.S. horse industry tens of millions of dollars each year.

C-FAR DOLLARS LEVERAGED TO OBTAIN ADDITIONAL FUNDING

C-FAR research investments are often utilized as seed funding to establish a particular research program. Once a research program acquires maturity, it is able to attract federal funding, corporate investments, and so forth. In recent years every dollar appropriated for research has been leveraged to obtain roughly four dollars in matched funding. These leveraged funds are often from outside Illinois, spurring additional economic growth for the state. A list of initiatives follows, with the current leveraged funding amounts detailed. It is anticipated that these investments will continue to yield additional leveraged funds in the future.

Evaluating Corn GMOs for Safety, Equivalence, and Environmental Impact and related projects funded at $450,424 were leveraged to obtain $16.3 million from the U.S. Department of Agriculture, the National Science Foundation, the Illinois Soybean Program Operating Board, the North Central Soybean Research Program, the United Soybean Board, the Illinois Missouri Biotechnology Alliance, the Illinois Corn Marketing Board, the Frash Foundation, Pioneer Hi-Bred International, Inc., Monsanto, Syngenta Seeds, Garst Seed Company, Soygenetics, Land O'Lakes, Golden Harvest Seeds, and Access Plant Technology.

Research and Discovery Program to Abate the Threats and Harness the Potential of Atmospheric Change to Benefit Illinois, funded at $1.9 million, was leveraged to obtain $4.1 million from the U.S. Department of Energy, the U.S. Department of Agriculture, the National Science Foundation, Archer Daniels Midland, Pioneer Hi-Bred, BASF International, Argonne National Laboratory, and Brookhaven National Laboratory.

Transgenic Swine Program, funded at $642,961, was leveraged to obtain $2.7 million from the U.S. Department of Agriculture, the Biotechnology Research and Development Corporation, the National Science Foundation, and Infigen, Inc.

Broccoli and Health and other projects funded at $342,000 were leveraged to obtain a $2.5 million grant from the U.S. Department of Agriculture.

Innovative Finishing and Marketing Strategies for Small Beef Producers and other projects funded at $192,000 were leveraged to obtain a $2.2 million grant from the U.S. Department of Agriculture.

Harnessing the Benefits of an Apple Scab Resistance Gene, funded at $104,400, was leveraged to obtain a $1.65 million grant from the National Science Foundation.

Farm Decision Outreach Central (farm.doc), funded at $365,000, was leveraged to obtain $1.54 million from the U.S. Department of Agriculture.

The Post-Antibiotic Era of Food Production, funded at $90,000, was leveraged to obtain a $1.35 million grant from the National Institutes of Health.

Neurochemistry of Growth and Leptin, funded at $69,000, was leveraged to obtain $1.3 million and employment of two full-time technicians from the U.S. Department of Agriculture and the National Institutes of Health.

Oocyte Penetration: An Indicator of Sperm Fertility and a related project, funded at $84,820, were leveraged to obtain $1.16 million from the U.S. Department of Agriculture and the National Institutes of Health.

Genetic Analysis of Salmonella Isolates from Swine Production Units, funded at $57,493, was leveraged to obtain $885,294 from the U.S. Department of Agriculture NRI program on Epidemiology and Food Safety.

Decision Support for Watershed Management and Planning, funded at $21,000, was leveraged to obtain $718,000 from the U.S. Department of Agriculture and U.S. Environmental Protection Agency.

For more information on C-FAR research outcomes and leveraged funding, visit the C-FAR website at www.ilcfar.org/research/commercialization.html and www.ilcfar.org/research/leveraging.html.
Southern Illinois University at Carbondale (SIUC) researchers specializing in biotechnology and genomics have developed the technology to establish broad-based resistance to sudden death syndrome (SDS) in soybeans. Sudden death syndrome (SDS) is the common name for a soybean root rot caused by the soil-inhabiting fungus *Fusarium solani* f.sp. *glycine*. The name “sudden death” refers to the early defoliation and death of the soybean plant. Soybean yield losses due to SDS typically range from 10% to 15%, but cases have occurred in which losses have reached over 70%. SDS disease tends to be most severe when cool temperatures and rainy conditions occur throughout the early flowering period and on well-managed soybeans with a high yield potential. SDS has been a problem in the Midwest since the 1980s, but producer concerns have escalated because losses to the disease have doubled every five years.

Through support from C-FAR, SIUC researchers developed SDS resistance in soybeans through traditional plant breeding methodology (non-GMO) supplemented with DNA marker selection. “C-FAR funding provided the necessary equipment that underpinned all the precise experiments with markers that identified the SDS-X lines and led to the map location of the genes and to their best markers being known,” said David Lightfoot, SIUC professor of agriculture and principle investigator. “C-FAR funding also provided the critical funds used to build a seed laboratory at SIUC’s Agronomy Research Center, where beans for all research field plots are sorted for planting and packeted after harvest.”

In collaboration with ACCESS Plant Technologies, Inc. located in Plymouth, Indiana, a trademarked and patented broad-based SDS resistant soybean is being launched to the private sector. Called SDS-X during development, this soybean line offers producers significant benefits and protection against this potentially devastating disease. The SDS-resistant soybean provides genetic resistance to all known isolates of *Fusarium solani* f.sp. *glycine*; it provides a significant reduction in fungal spore population density (by approximately 50% per year), provides for easier farm management of SDS by preventing the occurrence and spread of the disease, and helps preserve root and plant health so plants can reach their full genetic potential. The new technology used in SDS-X is also available to be bred into Roundup Ready®, CystX®, Xpr™, and traditional varieties. “The SDS-X technology stacks very well with other traits in “super-beans” because there is no measurable yield penalty attached to the SDS resistance we provide,” said Lightfoot.

Researchers are also using this technology to develop soybean cyst nematode–resistant (SCN) resistant soybean varieties. Utilizing this technology producers are expected to be able to reduce yield losses associated with SDS and SCN by 50% within the next 10 years and improve grower annual income by $156 million.

“This work has been extremely important to Illinois producers, as well as to the state’s economy,” said Steve Scates, C-FAR board member and soybean producer. “An ongoing and vibrant research program will continue to enable us to counter such devastating diseases and reduce the potential for tremendous crop, and therefore income, losses.”

Support for this research was also provided by the Illinois Soybean Checkoff Board and the United Soybean Board.
College students in agribusiness management courses, farm supply managers, and other agribusiness professionals are now able to improve their business management skills through training that incorporates an interactive business simulator called ProStar. The business simulator provides training and education in agribusiness management decision making in competitive markets. Funding support from C-FAR, the U.S. Department of Agriculture, and the Illinois Board of Higher Education, and technical support from GROWMARK, Inc. and Evergreen FS, Inc., made ProStar development and implementation possible. Earlier grants from the Illinois Department of Agriculture helped lay the groundwork for the enterprise simulation at the core of ProStar.

ProStar is a Web-based simulator of a retail fertilizer and chemical dealership that teaches users what impact their and their competitors’ decisions have on their profitability. Farm supply managers and others learn to make important decisions regarding setting prices, purchasing equipment, spending money on promotion and training, choosing a credit policy, hiring and firing of full and part-time employees, borrowing and repaying loans, issuing common stock, and making and calling investments. “Simulations such as ProStar provide current and future agribusiness managers the opportunity to learn how to make better management decisions in a virtual and safe setting in much the same manner that flight simulators help jet pilots learn how to make better flying decisions in a virtual and safe setting,” said Patrick D. O’Rourke, professor of agribusiness at Illinois State University and developer of the ProStar simulation.

GROWMARK, Inc. is the first large cooperative/corporate user of the ProStar simulator. ProStar is the centerpiece of two newly developed training programs developed by the company, Running an Agronomy Retail Business I and II, that educate local member cooperative personnel and GROWMARK staff on financial concepts, reports and consequences of daily decisions. “The ProStar simulation program is an extremely valuable tool to GROWMARK, Inc. and to the local FS member cooperatives throughout Illinois,” said Ed Rose, GROWMARK business development manager. “We need ProStar to not only continue to be available, but to continue to be developed and enhanced.”

ProStar workshops are also offered to anyone interested at Illinois State University throughout the calendar year. The next workshops are July 19–20 and July 22–23. For more information on ProStar and upcoming workshops, send email to Dr. O’Rourke at porourke@ilstu.edu.

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**Websites to Watch**

**C-FAR**
www.ilcfar.org

**NAT TOOLS FOR GOOD HEALTH**
www.nat.uiuc.edu
For analyzing diet and food choices.

**FARM.DOC**
www.farmdoc.uiuc.edu
Provides farmers with decision-making information and analysis tools.

**ILLINOIS TRAILL**
il-traill.outreach.uiuc.edu
Organizes livestock research, information, and expert services.

**ALTERNATIVE CROPS FOR ILLINOIS**
www.sws.uiuc.edu/data/altcrops
Helps farmers identify and find information on potential alternative crops.

**INTERACTIVE AGRONOMY HANDBOOK**
web.aces.uiuc.edu/iah
Databases and online resources complement handbook.

**PEST MANAGEMENT & CROP DEVELOPMENT BULLETIN**
www.ipm.uiuc.edu/bulletin/index.php
Provides scouting reports, management advice, and decision-aids tools.

**ILLINOIS IPM ONLINE**
www.ipm.uiuc.edu
An environment for learning about integrated pest management.

**ILLINOIS WATERSHED MANAGEMENT CLEARINGHOUSE**
www.watershed.uiuc.edu
Helps groups create and implement a plan to address local watershed issues.

**ILLINOIS WORLD FOOD AND SUSTAINABLE AGRICULTURE PROGRAM**
web.aces.uiuc.edu/wf
Covers world food issues and related agriculture and natural resource implications.
Illinois Council on Food and Agricultural Research
1101 W. Peabody Dr.
Urbana, IL 61801

Please call the C-FAR office or check the calendar on the C-FAR website at www.ilcfar.org for further details.