C-FAR
CONNECTION

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Illinois Livestock Research Initiative LIFTS Industry

THE ILLINOIS LIVESTOCK INTEGRATED FOCUS TEAMS STRATEGIC RESEARCH INITIATIVE HAS BEEN CRITICAL TO THE DEVELOPMENT OF PRODUCTS AND SERVICES CURRENTLY ASSISTING ILLINOIS' LIVESTOCK INDUSTRY.

In 2003, C-FAR launched a strategic research initiative (SRI) focused on addressing the economic and social challenges facing Illinois' livestock industry. Today nearing completion, the research initiative called Illinois Livestock Integrated Focus Teams (IL LIFT) has generated an array of management tools and informational resources that are aiding Illinois livestock operations. University of Illinois Extension dairy specialist Michael Hutjens has provided leadership for the SRI, which has been a collaborative effort of faculty and extension specialists from the University of Illinois at Urbana-Champaign and Southern Illinois University Carbondale, Illinois livestock producers, and State of Illinois agencies.

"It is important to recognize the significant contributions made by our beef, dairy, sheep, and pork producers to Illinois' economy," said Hutjens. "Our goal through this C-FAR research initiative has been to develop and share information that allows Illinois livestock producers to successfully compete nationally and worldwide in a sustainable and economic environment."

The SRI has focused on four areas of research: livestock facility siting in Illinois, using Illinois coproduct feeds in livestock feeding programs, evaluating Illinois forages used in pasture-based systems, and animal identification for enhanced food quality and monitoring livestock health. The following results have been realized from this multifaceted research effort.

Livestock Facility Siting in Illinois

As Illinois livestock facilities modernize and expand, they must meet state and federal requirements for manure handling, water and air quality protection, and good environmental stewardship in general. Awareness of the regulations usually

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GREETINGS

C-FAR and the Appropriation

As we engage in this challenging funding period for food and agricultural research in Illinois, we are naturally drawn to contemplating just exactly what C-FAR and the C-FAR appropriation means to our state's food, agricultural, and related industries. Doing so is very relevant as we put into context the significance of this funding and our organization.

C-FAR, the State of Illinois, and Illinois university leaders laid an initial foundation that has served our state immensely. It is critical to recognize that an organized approach to a meaningful food and agricultural research program was launched when C-FAR and the appropriation were established several years ago. Never before has such an initiative changed the face of research so positively for our state's number one industry. We reflect on the following:

C-FAR: a purposeful coalition – Illinois stands shoulders above other states in benefiting from such a diverse coalition, focused solely on advancing a state-funded food and agricultural research program.

Research collaborations – University leaders have shared that C-FAR has been absolutely critical in program development that enables meaningful research collaboration. Utilizing research expertise from different departments and universities has proven to yield greater results. C-FAR launched the state's most collaborative research program in 1995, and it remains the conduit for the continued existence of that research program today.

Enhanced funding – Recognition of the importance of food and agricultural research in Illinois has been greatly elevated and has resulted in millions of dollars being directed by the State of Illinois to this fundamental foundation of Illinois' greatest economic engine. Due almost entirely to the C-FAR appropriation, Illinois raised its food and agricultural research investment, and subsequently its research capacity, from 26th to 15th in the nation.

Funding leveraged – In addition to the 35–60% return on investment from State of Illinois research appropriations and 35 jobs being created for every $1 million appropriated (per numerous nationally respected studies and the U.S. Department of Labor), Illinois researchers have effectively utilized their C-FAR funding to leverage hundreds of millions of dollars from the federal government and other sources.

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C-FAR RESEARCH FUNDING IS PROVIDED BY THE STATE OF ILLINOIS. C-FAR GRATEFULLY ACKNOWLEDGES THE STATE OF ILLINOIS FOR THESE FINANCIAL INVESTMENTS, WHICH ENABLE ADVANCEMENTS IN ILLINOIS' FOOD AND AGRICULTURAL INDUSTRIES AND SIGNIFICANTLY CONTRIBUTE TO THE ECONOMIC VITALITY OF OUR STATE.

C-FAR and the Appropriation

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Reporting and accountability – C-FAR appropriations and resulting investments in research have been reported on in a highly transparent manner. Detailed information on every C-FAR research initiative and every financial expenditure has been extensively documented and made available to the public.

Enabling the people's voice – An effective platform has evolved that allows for industry representatives to meaningfully engage in our state's food and agricultural research program, in cooperation with our state's research community. Such a platform is a win-win situation.

Fulfilling a vital need – Although there were significant and notable research needs that anchored C-FAR's and the appropriation's establishment, today's needs – some 16 years later – may well be even greater. By many measures, Illinois agriculture is currently in one of its most dynamic periods of change.

And lastly, research outcomes – All of these factors have resulted in deeply meaningful research being conducted, yielding significant tangible results. This is research that has been effective and of relevance both for Illinois' immediate needs and for future opportunities. These research outcomes have been extensive and continue to benefit Illinois and its citizens.

In addition to this myriad of advancements, consider these notable developments: a $100 million Energy Biosciences Institute has been established at the University of Illinois at Urbana-Champaign; bright young researchers have chosen Southern Illinois University Carbondale as the institution where they are building their research programs; Western Illinois University installed its first and only full-time researcher, who has launched a cutting-edge alternative crops program; and the state's most comprehensive composting program at Illinois State University is solving complicated urban and livestock waste issues. These developments *would not* have occurred had it not been for the C-FAR appropriation.

Let us remain highly cognizant of what the C-FAR program and appropriation affords our great state. As the most steadfast membership I have been affiliated with, I know you join me in recognizing these many advancements. It is a record that speaks strongly to our past and clearly suggests the significance for our future.

Sincerely,

Jerry R. Hicks
Chairman of the Board

Illinois Livestock Research Initiative LIFTS Industry

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enhances acceptance in the neighborhood, good standing in the community, and long-term economic benefits for their facilities. Researchers worked to assess the level of regulatory compliance by current large livestock facilities, learn the reasons for noncompliance, and design steps to improve compliance and its positive impact on the community.

An on-farm survey of livestock manure nutrient management plans and practices at 36 swine facilities throughout Illinois was conducted. Investigators sought to determine Confined Animal Feeding Operations (CAFO) regulatory compliance and recordkeeping, neighbor relations and awareness of odor nuisance potential, and storm water pollution prevention. Findings from the survey were incorporated into the state-mandated livestock producer certification training program. Forty-five workshops were held from December 2006 to March 2009 with a total of about 1,670 producers, contractors, educators, and others participating.

An interactive website called Illinois Manure Management Plans (IMMP) (www.IMMP.uiuc.edu) was developed to assist producers and consultants in building and updating their manure nutrient management plans and to provide for convenient recordkeeping. "About 500 livestock facilities in Illinois are large enough to be required to have a manure management plan," said Ted Funk, University of Illinois Extension specialist and principal investigator of the project. "The IMMP manure management planning tool was developed in cooperation with the Illinois Department of Agriculture, Illinois Environmental Protection Agency, and Natural Resources Conservation Service in Illinois, making it possible for producers to adopt one plan that satisfies the needs of all three agencies."

Producers using IMMP find it beneficial in getting their manure management plans prepared and updated. Carla Frederick, an employee at a large beef feedlot, says "I like being able to sign on [the IMMP website] at home and put in data while I'm away from all the distractions at the office. Putting in soil sample records, for instance – it's a walk in the park!" Other producers are impressed with the calculations the Web application supplies. Steve Ramp, a swine finisher, says "I want to be able to know where I can safely apply manure and reduce commercial fertilizer applications, while maintaining crop yields. IMMP shows me what I need."

Illinois producers can also access environmental regulations affecting livestock and crop production through the newly-developed EZregs website (www.EZregs.uiuc.edu). The website, another project leveraged by the C-FAR SRI and developed during the SRI period, provides federal and state regulations related to environmental protection, safe use of agricultural chemicals, and livestock facility construction, management, and siting. EZregs has had almost 100,000 online page views since it was launched, and state agencies consistently point agriculture clients toward the site to get quick information on regulations.

Using Illinois Coproduct Feeds in Livestock Feeding Programs

Livestock feeds using distiller's grains and other ethanol production coproducts are becoming more popular in Illinois and in the Midwest as new plants come on line. Livestock producers and agribusiness personnel need research results, guidelines, pricing guidelines, and recommendations to effectively use these coproducts.

A website was developed (http://ilift.traill.uiuc.edu/distillers) providing information on distiller's grains and their utilization in swine, dairy, and beef cattle diets. The website also lists ethanol plants in or within a 100-mile radius of Illinois, including contact person, yearly production of distiller's grains, products available, pricing structure, nutritive value/specifications, minimum load, and their website address (if available). An economic spreadsheet calculates the break-even price of using co-product feeds. The site is regularly accessed by livestock producers and for statewide programs run by Extension educators specialized in swine, dairy, and beef production. Weekly prices can be found in a link on available coproducts feeds in the Midwest.

A software program will soon be available, allowing producers to calculate an economic comparison of a variety of feeds, including those using distiller's grains and other ethanol coproducts. The program considers nutrient value of the feed, transportation costs, and shrink

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loss to calculate the cost per unit of energy, cost per unit of protein, and break-even prices that are useful in decision-making. Producers can compare hay, forages, grains, coproduct feeds, and commercial coproducts by companies to find the most economic source of nutrients for their particular enterprise. Developed with support from the Illinois Corn Growers Association, the new management tool will be available on the Illinois Livestock Trail (SRI main website at www.livestocktrail.uiuc.edu) and Farmdoc (www.farmdoc.uiuc.edu) websites.

"Illinois' livestock industry is currently challenged with higher feed prices coupled with low livestock and milk prices," said Hutjens. "This software program will help them answer the question, 'Where can I find the most economic source of feed nutrients for my operation?'"

"This SRI component project continues to grow and has been a win-win for Illinois. Livestock producers can now more easily find and compare economic feed products, corn and soybean growers are able to market their coproducts closer to home, and consumers can continue to purchase locally grown, high-quality meat and dairy products at economical prices."

Using Illinois Forages Based on Pasture-Based Systems

To lower production costs and reduce soil losses, livestock producers have renewed interest in forage-based feeding systems that utilize high-quality, intensively managed pastures with residual forages being used as alternative winter feeds. Researchers compared the relative economic value and nutrient quality of integrating grazing animal systems into a conventional crop rotation system. Forages were sampled on four test demonstration farms for two years, tested at an Illinois commercial forage testing lab, and summarized statistically.

This study indicates that forage quality of managed grazing systems is sufficient to maintain a cow-calf enterprise and dairy heifers. High-production enterprises such as lactating ewes and dairy cows or growing calves may require energy supplementation to support desired performance. Results suggest that complete utilization of annual forages is required to compete with traditional forages. A total of 764 forage samples have been collected, analyzed, and entered into a database. Results from this study continue to be published in scientific papers and industry publications, posted on topic related websites, and presented at seminars and field days across Illinois and the United States.

Animal Identification for Enhanced Food Quality and Monitoring Livestock Health

Animal identification is a national concern for producers, processors, and consumers. The goal of this initiative is to develop a simple, cost-effective method for permanently identifying animals from birth to market to improve animal health, traceability of livestock products, and meat and milk quality. Producers would also benefit by being able to manage their livestock using individual animal data such as body temperature, expression of estrus, or rumen pH. Test micrometer-scale electronic devices are under development as a method for permanent animal identification and physiological monitoring, with an emphasis on body temperature tracking in real time.

This project was expanded into a statewide program with support from the Illinois Department of Agriculture, the Illinois Milk Producers Association, and the USDA premise identification program. "Expanding animal identification to collect animal data on the farm will be important in the future to expand animal identification at the farm level," states Hutjens.

In Summary

"C-FAR funding of the IL LIFT SRI has been critical to the development of several products and services currently assisting Illinois' livestock industry. It has also allowed us to bring in graduate students both for their own training and in order to accomplish many of the goals set forth through this significant research effort," said Hutjens. "Although there is still research to be done, much has been accomplished that will have a positive impact on this important Illinois industry for years to come."

Though funding for the SRI officially ended in June 2007, no-cost extensions were granted to several program components to allow researchers to complete their research and outreach efforts. Additional information can be found on the Illinois Livestock Trail website at www.livestocktrail.uiuc.edu.

Giant Cane Investigated for Economic and Environmental Applications

JAMES ZACZEK (LEFT), PROFESSOR OF FORESTRY, AND GRADUATE STUDENT DAVID DALZOTTO EXAMINE PLANTS PRODUCED AT THE NATION'S FIRST GIANT CANE NURSERY ESTABLISHED AT SOUTHERN ILLINOIS UNIVERSITY CARBONDALE.

Southern Illinois University Carbondale (SIUC) researchers have established the nation's first giant cane nursery to facilitate refinement of cultivation methods and investigate applications of benefit to Illinois and beyond. Through support from C-FAR, SIUC forestry professors Jon Schoonover and James Zaczek and their research team are working to establish sustainable sources of giant cane for Illinois restoration projects, to explore genotypic variation among giant cane sources to match planting sites, to establish a riparian buffer research and demonstration site, and to examine the species for bioenergy production.

"The ultimate goal of this initiative is to produce giant cane reproductive segments for riparian filter strips or habitat restoration, while continuing our research on planting methods, fertilization, and biofuel potential," said Zaczek.

A bamboo species native to the United States, giant cane grows to a height of 20 feet, with a diameter of 1 inch. The plant was once widespread throughout the southeast, covering thousands of acres of rich bottomland. The plant grows as far north as Illinois and Maryland, and it historically dominated southern Illinois floodplains in naturally existing thick stands. Through the expansion of agricultural production, wildfire suppression, and changes in urban and rural land use, naturally occurring giant cane has largely disappeared, and it now covers less than 2% of its native range.

Over 50 wildlife species depend on giant cane for their habitat. With the disappearance of naturally appearing cane stands, several rare species that live in this unique environment are becoming endangered or threatened, including Swainson's warbler, the swamp rabbit, and the canebrake rattlesnake. A major challenge for natural resource managers in their restoration efforts is acquiring giant cane planting stock. "Research is underway to develop a sustainable source of propagules for giant cane habitat restoration," said Zaczek. "We're designing a do-it-yourself nursery where wildlife and other natural resource managers can use our methods to create their own nurseries. That would let them harvest their own rhizomes (underground stems) to plant somewhere else. It's a sustainable ecological restoration process."

Giant cane has proven to be useful as riparian buffer zones for waterways along agricultural production areas. Studies have shown that, when planted along rivers and streams, giant cane's root system serves as an effective filter for keeping agricultural nutrients and bacteria from livestock waste from washing off fields and into the water, while protecting the banks from erosion. This makes giant cane attractive to both agricultural producers and natural resource managers. The plant is also being investigated for its carbon sequestration capacity.

In addition to environmental applications, giant cane is being investigated as a potential bioenergy crop. The development of giant cane for use as a biofuel may offer the opportunity to develop sustainable agricultural practices that compliment and enhance traditional cropping systems. "Cultivated plants are being used as biofuels and biofilters, and for carbon sequestration; however, few native species have had intensive evaluations of their agricultural potential and environmental benefits," said Schoonover. "Giant cane is being studied to determine its utility for biomass/bioenergy production, along with its capacity for protecting Illinois waterways and providing important habitat for wildlife."

Research on cultivation practices have shown the following:

- Although bamboo sprouts best from its rhizomes rather than from the above-ground shoots (or culms), rhizome pieces produce more shoots if short pieces of culm remain attached.
- Rhizomes sprout better when the end with the nodes and buds receives some sunlight.
- Rhizomes can be planted with a tree planter and harvested with a backhoe or lifter.

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Giant Cane Investigated for Economic and Environmental Applications

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- Though rhizomes might do a little better if started in a greenhouse, that slight advantage may not out weigh the expense involved in planting them twice.
- Herbicides proved marginally helpful, but cane can tolerate weed competition, so it doesn't absolutely require weed killer.
- Rhizome collection and planting should take place in the spring. Fall collection and planting has demonstrated poor survival.
- Periodic burning reduces the shoots' height and diameter, but increases the density and helps it spread to adjacent areas. Without fire, perhaps every 7 to 10 years, the stands start to die back, and although new culms appear, much dead material remains standing.

JON SCHOONOVER, SIUC ASSISTANT PROFESSOR OF FORESTRY, COLLECTS GIANT CANE WITH BELOW-GROUND RHIZOMES FOR USE AS PLANTING STOCK AT THE SIUC CANE NURSERY.

"Tomorrow's agricultural production practices may well be noticeably different from what we currently employ," said Chuck Cawley, C-FAR research chair. "This research seizes a window of opportunity to address future agricultural production needs we probably cannot envision today."

Websites to Watch

C-FAR
www.ilcfar.org
Your headquarters for C-FAR news and information on funded and completed research.

NAT TOOLS FOR GOOD HEALTH
www.nat.uiuc.edu
A source for analyzing diet and food choices.

ILLINOIS CENTER FOR SOY FOODS
www.soyfoodsillinois.uiuc.edu
A resource for consumers on soy foods and nutrition.

FARM.DOC
www.farmdoc.uiuc.edu
Provides producers and other agricultural professionals with decision-making information and analysis tools.

MARKETMAKER
www.marketmaker.uiuc.edu
An interactive mapping system that locates businesses and markets of agricultural products in Illinois, it provides an important link between producers and consumers.

MISCANTHUS BIOENERGY RESEARCH
http://miscanthus.illinois.edu
Provides the latest information on research investigating the use of Miscanthus (Miscanthus x giganteus) as a potential bioenergy resource for Illinois and the nation.

SWINE WASTE ECONOMICAL AND ENVIRONMENTAL TREATMENT ALTERNATIVES
www.sweeta.illinois.edu
An outreach and dissemination arm of the Livestock and Urban Waste (LUW) research team designed to inform stakeholders and disseminate technology information to end users.

ILLINOIS TRAILL
www.livestocktrail.uiuc.edu
Organizes livestock research, information, and expert services.

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2009-2010 CALENDAR

November 11	**Board of Directors Meeting**
January 5, 2010	**Board of Directors Meeting**
February 16	**Annual Membership Meeting (Springfield)**
February 24	**Board of Directors Meeting**
July 7	**Board of Directors Meeting**

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