

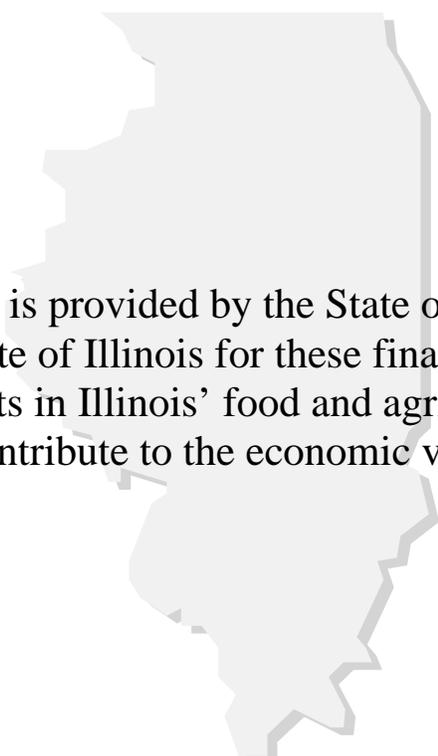
# Research Portfolio

FISCAL YEAR 2009



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*The mission of the Illinois Council on Food and Agricultural Research (C-FAR) is to advance profitable, consumer-sensitive, environmentally sound food, agricultural and related systems by securing funding for relevant research and outreach and fostering public participation in program guidance.*



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.

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# FY09 PROGRAM ALLOCATIONS

Appropriation.....\$2,275,000

Less (per Food and Agriculture Research Act):

➤ 1% C-FAR Member Expense Account (1% of the appropriation) .....22,750

➤ Illinois Department of Agriculture Fee (1/2 of 1% of the appropriation) ..... 11,375

BALANCE:.....\$2,240,875

External Competitive Grants Program (per Food and Agriculture Research Act and additional funds per footnote <sup>(1)</sup>) .....392,374 <sup>(1)</sup>

Allocations to Universities (percentages per Food and Agriculture Research Act) .....1,904,744

University	Gross	Strategic Research Initiatives <sup>(2)</sup>	C-FAR Administrative Office <sup>(3)</sup>	Achievement Award <sup>(4)</sup>	University Internal Net
UIUC (82%)	1,561,890	-0-	218,180	-0-	1,343,710
SIUC (11%)	209,522	-0-	29,268	-0-	180,254
ISU (4%)	76,190	-0-	10,643	-0-	65,547
WIU (3%)	57,142	-0-	7,982	-0-	49,160
<b>TOTALS</b>	<b>1,904,744</b>	<b>0</b>	<b>266,073</b>	<b>0</b>	<b>1,683,671</b>

<sup>(1)</sup> External Program funding comprised of: (1) 15% of FY09 appropriation, minus fees – \$2,240,875 x 15% = \$336,131; (2) \$39,099 of unexpended/returned SRI and External Program funds; (3) \$15,385.02 of unexpended funds from the FY08 1% Member Expense account; (4) \$1,758.60 from the External Program Reviewer account.

<sup>(2)</sup> There are no SRI funding commitments in FY09.

<sup>(3)</sup> The FY09 C-FAR Administrative Office budget total is \$297,950 and is met by \$31,877 of unexpended funds from the FY08 Administrative Office account and \$266,073 of FY09 funds.

<sup>(4)</sup> Funding is not being allocated to the Achievement Award in FY09, enabling these funds to rather be directed to ongoing research funding commitments.

# KEY TO PORTFOLIO ENTRIES

## Project Entry

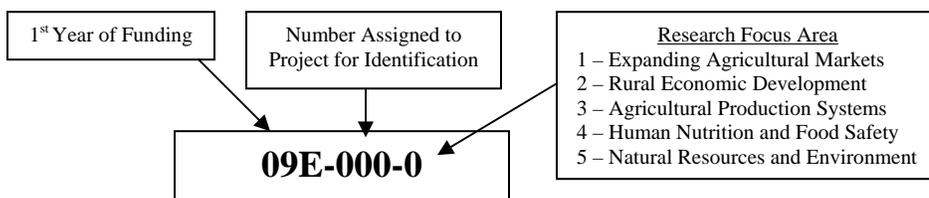
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<b>Title</b>		<i>Project Number</i>
<b>Principal Investigator Name</b> <i>Additional PI Names</i>	<b>PI Institution</b> <i>Additional PI Institutions</i>	<b>PI Department</b> <i>Additional PI Departments</i>
<b>Current Funding:</b> (see notes below)		Program Type                      Project Length
<b>Description:</b>		

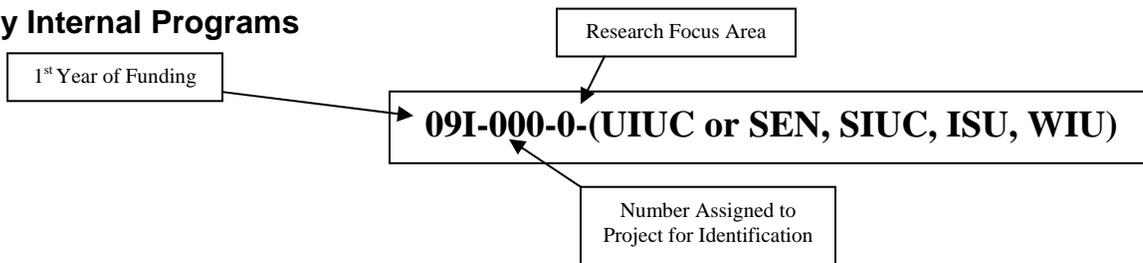
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## Project Numbers

### External Competitive Grants Program



### University Internal Programs



### Strategic Research Initiative Program



- \* External Competitive Grants Program and University Internal Program entries reflect funding allocated to the project in FY09 only (except where otherwise noted).
- \* Strategic Research Initiative Program projects reflect total funding committed over the life of the SRI. These initiatives have officially ended, however several component projects continue through no-cost extensions for this work to be brought to full fruition.
- \* All initiatives receiving FY08 funding were granted a one-year extension due to funding being realized late in the fiscal year.
- \* Funding decisions regarding Illinois State University Internal Program investments will be determined once FY09 funding has been released.

# EXTERNAL COMPETITIVE GRANTS PROGRAM AND UNIVERSITY INTERNAL PROGRAMS

As stipulated in the Food and Agriculture Research Act, the C-FAR appropriation's enabling legislation, a minimum of 15% of the total C-FAR appropriation is allocated for an External Competitive Grants Program, open to qualified researchers at nonprofit institutions, organizations, and agencies in Illinois. C-FAR's working groups evaluate and select proposals to fund.

C-FAR funds not allocated to the External Competitive Grants Program are allocated on a percentage basis (per the Food and Agriculture Research Act) to the University of Illinois at Urbana-Champaign, Southern Illinois University Carbondale, Illinois State University, and Western Illinois University. Each university sponsors an internal competitive grants program that addresses C-FAR research priorities.

The University of Illinois supports a Sentinel Program as part of its internal program. The Sentinel Program's purpose is to take advantage of opportunities for performing creative, problem-solving research.



# EXPANDING AGRICULTURAL MARKETS

**OBJECTIVE:** Enhance the Illinois food and agricultural industry's profitability by identifying consumer demand, developing marketing expertise, developing new technologies, and advancing existing technologies to retain and to expand markets for agricultural products.

<b>Alternative Crops Development</b>		05I-005-1-WIU	
<i>Winthrop Phippen</i> <i>Thomas Abbott</i>	<i>Western Illinois University</i> <i>National Center for Agricultural Utilization Research</i> <i>(USDA)</i>	<i>Agriculture</i> <i>New Crops Unit</i>	
<b>Current Funding:</b>	\$47,380	Internal-WIU	Year-to-Year
<b>Description:</b>	Establishment of an alternative crops breeding and production program initially aimed at introducing alternative crops, such as cuphea and milkweed, to the Midwest region.		
<b>Can Tropical Maize Sweeten Ethanol Production?</b>		09E-075-1	
<i>Fred E. Below</i>	<i>University of Illinois at Urbana-Champaign</i>	<i>Crop Sciences</i>	
<b>Current Funding:</b>	\$53,454	External	2-year
<b>Description:</b>	Recent studies showed that tropical maize acts like temperate sugarcane. This project will evaluate the biological potential for sugar production, its value as a feedstock for making biofuels, and its value as a high-energy forage for ruminant animals.		
<b>Effect of Distiller's Grains on Fatty Acid Composition and Meat Quality in Steers</b>		08E-068-1	
<i>Rebecca Atkinson</i> <i>Paul Walker</i>	<i>Southern Illinois University Carbondale</i> <i>Illinois State University</i>	<i>Animal Science, Food and Nutrition</i> <i>Agriculture</i>	
<b>Current Funding:</b>	N/A (received no-cost extension)	External	1-year
<b>Description:</b>	Feedlot steers will be fed increasing levels of distiller's grains to determine the optimal level of inclusion that will enhance unsaturated fatty acid incorporation into meat without negatively effecting meat quality or increasing prevalence of E. coli and Salmonella.		
<b>Engineering Yeast Strains to Enhance Bio-Ethanol Production Efficiency</b>		07I-007-1-SIUC	
<i>Ahmad Fakhoury</i>	<i>Southern Illinois University Carbondale</i>	<i>Plant, Soil and Agricultural Systems</i>	
<b>Current Funding:</b>	N/A (received no-cost extension)	Internal-SIUC	2-year
<b>Description:</b>	Due to increased demands for ethanol as a bio-fuel, there is need to enhance the process by which ethanol is fermented from corn starch. Successful fermentation requires strains of <i>Saccharomyces cerevisiae</i> that can tolerate, among other conditions, increasing ethanol concentrations and decreasing pH. While existing strains of this yeast may be adequate for current needs, there is great need to develop improved strains that will generate ethanol more effectively. Specific goals of this project are to: (1) generate yeast mutants tolerant to high concentrations of ethanol and low pH; and (2) partially characterize mutations in generated <i>S. cerevisiae</i> strains.		
<b>Enhancing the Nutritional Value of Milk and Milk Products by Boosting their Omega-3 Fatty Acids Content</b>		06E-074-1	
<i>Amer AbuGhazaleh</i> <i>Karen Jones</i>	<i>Southern Illinois University Carbondale</i> <i>Southern Illinois University Carbondale</i>	<i>Animal Science, Food and Nutrition</i> <i>Animal Science, Food and Nutrition</i>	
<b>Current Funding:</b>	N/A (received no-cost extension)	External	3-year
<b>Description:</b>	The primary objective of this project is to establish procedures for the on-farm production of omega-3 enriched milk and milk products. The production of omega-3 enriched milk, cheese and ice cream will be accomplished through supplementing grazing cows with dietary algae, fish oil and linseed oil. Consumer acceptability of milk, cheese and ice cream enriched with omega-3 will also be evaluated.		

<b>Establishing an Illinois Soy Foods Center for Research and Education</b>		<i>011-006-SEN</i>	
<i>Barbara Klein</i> <i>Keith Cadwallader</i>	<i>University of Illinois at Urbana-Champaign</i> <i>University of Illinois at Urbana-Champaign</i>	<i>Food Science and Human Nutrition</i> <i>Food Science and Human Nutrition</i>	
<b>Current Funding:</b>	N/A (received no-cost extension)	Sentinel-UIUC	5-year
<b>Description:</b>	Creates facilities to develop and test healthy new foods from soybean. The Soy Foods Center will also work on marketing and technology transfer. The goal is to greatly increase human consumption of soy.		
<b>Evaluating Crude Glycerol, a Biodiesel By-Product, as a Feed Supplement for Dairy Cows</b>		<i>081-001-1-SIUC</i>	
<i>Amer AbuGhazaleh</i> <i>Phillip Eberle</i> <i>Chet Stuemke</i>	<i>Southern Illinois University Carbondale</i> <i>Southern Illinois University Carbondale</i> <i>Southern Illinois University Carbondale</i>	<i>Animal Science, Food and Nutrition</i> <i>Agribusiness Economics</i> <i>University Farms-SIUC</i>	
<b>Current Funding:</b>	N/A (received no-cost extension)	Internal-SIUC	1-year
<b>Description:</b>	This study will evaluate the potential of crude glycerol in diets of dairy cows. The long-term goal is to develop a new market for crude glycerol through the animal feed industry.		
<b>Evaluation and Scale-up Research Capability for Ethanol Research</b>		<i>081-015-1-SEN</i>	
<i>Vijay Singh</i> <i>Kent Rausch</i> <i>Carl Parsons</i> <i>James Pettigrew</i> <i>David Johnston</i>	<i>University of Illinois at Urbana-Champaign</i> <i>University of Illinois at Urbana-Champaign</i> <i>University of Illinois at Urbana-Champaign</i> <i>University of Illinois at Urbana-Champaign</i> <i>USDA/ARS/ERRC</i>	<i>Agricultural and Biological Engineering</i> <i>Agricultural and Biological Engineering</i> <i>Animal Sciences</i> <i>Animal Sciences</i>	
<b>Current Funding:</b>	\$30,000	Sentinel-UIUC	3-year
<b>Description:</b>	Investigators will (1) set up and test a pilot scale (300 liters) dry grind fermentation capacity plant; (2) determine engineering and fermentation data for the E-mill process at the pilot plant scale; and (3) produce material for feeding studies and for recovery of zein and other bioproducts.		
<b>Examination of Ethanol, Marketing, Input Procurement Practices and Technological Flexibility of the U.S. Ethanol Producers</b>		<i>081-003-1-ISU</i>	
<i>Aslihan Spaulding</i>	<i>Illinois State University</i>	<i>Agriculture</i>	
<b>Current Funding:</b>	N/A (received no-cost extension)	Internal-ISU	1-year
<b>Description:</b>	This study will (1) examine the current marketing and procurement practices of ethanol production plants; (2) examine ethanol producer's flexibility and readiness for new technologies; (3) examine the differences and similarities between small versus large production plants; (4) examine the differences and similarities between farmer cooperatives and private investors.		
<b>Fractionation of Thin Stillage from Dry Grind Processes to Determine Water Recycling Rates and Heat Transfer Properties</b>		<i>071-012-1-SEN</i>	
<i>Kent Rausch</i>	<i>University of Illinois at Urbana-Champaign</i>	<i>Agricultural and Biological Engineering</i>	
<b>Current Funding:</b>	\$30,000	Sentinel-UIUC	3-year
<b>Description:</b>	Determine membrane filtration and heat transfer fouling characteristics of the thin stillage process stream in an effort to identify opportunities for increasing value of this stream while increasing water recycle and reducing energy requirements during production of ethanol.		

<b>Identity Preserved Grain: Will there be a Market? A Survey of Illinois Grain Elevator Managers</b>		<i>08I-004-1-ISU</i>	
<i>Rick Whitacre</i>	<i>Illinois State University</i>	<i>Agriculture</i>	
<b>Current Funding:</b>	N/A (received no-cost extension)	Internal-ISU	1-year
<b>Description:</b>	The purpose of this study is to determine grain elevator manager's perception of the future of the identity preserved grain market in Illinois.		
<b>Impact of Vermicompost on the Establishment and Production Practices of <i>Maclura pomifera</i> for Utilization in Bioproduct Development</b>		<i>08I-001-1-ISU</i>	
<i>Gary Bachman</i>	<i>Illinois State University</i>	<i>Agriculture</i>	
<b>Current Funding:</b>	N/A (received no-cost extension)	Internal-ISU	1-year
<b>Description:</b>	This study will develop best management practices for field establishment and cultivation of <i>Maclura pomifera</i> as a managed crop for use in the production of bioproducts.		
<b>New and Alternative Crops for a Bio-based Economy</b>		<i>08I-001-1-WIU</i>	
<i>Winthrop Phippen</i>	<i>Western Illinois University</i>	<i>Agriculture</i>	
<b>Current Funding:</b>	N/A (received no-cost extension)	Internal-WIU	1-year
<b>Description:</b>	This research will evaluate the potential of selected new crops as bio-based fuel sources. Crops to be evaluated include Brassica species, cuphea, okra and milkweed.		
<b>Optimizing Food and Fuel Production</b>		<i>07I-004-1-SEN</i>	
<i>Larry Berger</i>	<i>University of Illinois at Urbana-Champaign</i>	<i>Animal Sciences</i>	
<b>Current Funding:</b>	\$60,000	Sentinel-UIUC	3-year
<b>Description:</b>	The effects of plant maturity and chemical treatment on the nutritional value of corn stalklage fed with distillers grains to growing cattle will be determined. Investigators will determine the energy feasibility and process economics for both drying and freezing alternatives in corn preservation. The quality of the fermentations resulting from these two alternatives will be quantified.		
<b>Pork: A Potential Omega-3 Food Source in the American Diet</b>		<i>07I-001-1-SIUC</i>	
<i>Amer AbuGhazaleh</i> <i>Gary Apgar</i> <i>Phil Eberle</i>	<i>Southern Illinois University Carbondale</i> <i>Southern Illinois University Carbondale</i> <i>Southern Illinois University Carbondale</i>	<i>Animal Science, Food and Nutrition</i> <i>Animal Science, Food and Nutrition</i> <i>Agribusiness Economics</i>	
<b>Current Funding:</b>	N/A (received no-cost extension)	Internal-SIUC	2-year
<b>Description:</b>	The purpose of this project is to enhance the nutritional value and quality of Illinois pork by boosting the concentration of omega-3 fatty acids. The long-term objective of this project is to enable Illinois hog farmers to enter the fastest growing and expanding sector of the agricultural market in the U.S today (healthy food market) by engaging them in alternative hog production systems through which value added products are produced. Researchers hypothesized that high omega-3 pork meat can be produced by supplementing pigs diet with omega-3 oil source (linseed oil) and such meat would be a safe alternative to fish in Americans diet.		
<b>Thermo-Chemical Conversion (TCC) of Biomass for Renewable BioEnergy</b>		<i>07I-008-1-SEN</i>	
<i>Yuanhui Zhang</i>	<i>University of Illinois at Urbana-Champaign</i>	<i>Agricultural and Biological Engineering</i>	
<b>Current Funding:</b>	\$60,000	Sentinel-UIUC	3-year
<b>Description:</b>	Establish an integrated, hydrothermal, and biological based thermo-chemical conversion technology and process for renewable bioenergy production using agricultural waste. A variety of biomass will be converted to fuel, fuel additives, and value-added chemicals.		

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## RURAL ECONOMIC DEVELOPMENT

**OBJECTIVE:** Identify, examine, and develop enterprises and practices that support economic vitality for healthy rural and urban communities.

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### Characterizing Virus-Nematode Complexes that Limit Vineyard Sustainability

07E-067-2

*Bradley Taylor  
Alan Walters  
Jason Bond*

*Southern Illinois University Carbondale  
Southern Illinois University Carbondale  
Southern Illinois University Carbondale*

*Plant, Soil and Agricultural Systems  
Plant, Soil and Agricultural Systems  
Plant, Soil and Agricultural Systems*

**Current Funding:** \$113,976 (total funding - provided in FY07)

External 3-year

**Description:** Locally grown grapes drive winery production and marketing opportunities. Emergence of chronic debilitating diseases threatens these opportunities. This project will define incidence of virus-nematode complexes in Illinois vineyards, relate it to associated management practices, and develop strategies to preserve the \$34 million overall potential impact to our rural economies.

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### Comprehensive Legal Guide for Illinois Direct Farm Businesses

09E-066-2

*Bryan Endres*

*University of Illinois at Urbana-Champaign*

*Agricultural and Consumer Economics*

**Current Funding:** \$15,643

External 1-year

**Description:** Legal barriers exist to the formation and operation of direct farm businesses. This project will identify and analyze legal impediments and create a Guide with an accompanying website to assist Illinois farmers in navigating the legal environment for direct farm businesses.

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### Creating Strategies for an Entrepreneurial Culture in Rural Illinois Communities

09E-057-2

*Christopher Merrett  
Fred Iutzi  
Gisele Hamm*

*Western Illinois University  
Western Illinois University  
Western Illinois University*

*Illinois Institute for Rural Affairs  
Illinois Institute for Rural Affairs  
Illinois Institute for Rural Affairs*

**Current Funding:** \$74,400

External 2-year

**Description:** The project will identify strategies to help communities create and support businesses while creating community wealth and community acceptance of these enterprises. The focus is on ways to stimulate community, rather than individual entrepreneurship and investment.

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### Development of Enterprise Profit Models for the Illinois Livestock Industry

07I-002-2-SEN

*Michael Hutjens  
Gary Schnitkey  
Dale Lattz  
Richard Knipe*

*University of Illinois at Urbana-Champaign  
University of Illinois at Urbana-Champaign  
University of Illinois at Urbana-Champaign  
University of Illinois Extension*

*Animal Sciences  
Agricultural and Consumer Economics  
Agricultural and Consumer Economics  
Animal Systems, Beef and Agriculture  
Entrepreneurship  
Animal Sciences*

*Alan Miller*

*University of Illinois at Urbana-Champaign*

**Current Funding:** \$0

Sentinel-UIUC 3-year

**Description:** This project is designed to identify financially profitable opportunities for Illinois producers interested in livestock as a main or alternative enterprise. The objective of this research is to ultimately develop strategic profit models for the swine, dairy, and beef industries.

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**Engineering-Economic System Models for Rural Ethanol Production Facilities**

07E-062-2

*Luis Rodríguez*  
*Steven Eckhoff*  
*Madhu Khanna*  
*Aslihan Spaulding*

*University of Illinois at Urbana-Champaign*  
*University of Illinois at Urbana-Champaign*  
*University of Illinois at Urbana-Champaign*  
*Illinois State University*

*Agricultural and Biological Engineering*  
*Agricultural and Biological Engineering*  
*Agricultural and Consumer Economics*  
*Agriculture*

**Current Funding:** N/A (received no-cost extension)

External

2-year

**Description:** The emergence of the ethanol industry has boosted the rural economy, although small plants are under competitive pressure. Investigators shall build an integrated systems model of the industry to evaluate the sustainability of cooperative dry grind facilities.

**Multifunctionality (Post-Productivism) of Agriculture: Measuring Non-Market Value of US Agriculture**

08I-014-2-SIUC

*Wanki Moon*  
*Jacob Griffith*

*Southern Illinois University Carbondale*  
*Southern Illinois University Carbondale*

*Agribusiness Economics*  
*Coal Extraction and Utilization Research Center*

**Current Funding:** \$20,000

Internal-SIUC

2-year

**Description:** This research will address a set of coherently interrelated topics under the concept of multifunctional agriculture including: (1) quantifying the monetary value that our society places on non-market goods and services of agriculture; (2) redesigning domestic farm and trade policies and programs compatible with WTO rules that recognize the multifunctional role of agriculture; (3) analyzing the role of multifunctionality in WTO trade liberalization talks; and (4) developing a rural development research agenda compatible with the concept of multifunctionality.

**Organization, Financial Feasibility, and Rural Economic Impacts of Bioenergy in Illinois**

08E-011-2

*Ira Altman*  
*Dwight Sanders*  
*Wanki Moon*

*Southern Illinois University Carbondale*  
*Southern Illinois University Carbondale*  
*Southern Illinois University Carbondale*

*Agribusiness Economics*  
*Agribusiness Economics*  
*Agribusiness Economics*

**Current Funding:** \$129,106 (total funding - \$118,210 in FY08; \$10,896 in FY09)

External

3-year

**Description:** This research focuses on the organization, financial feasibility and rural economic impacts of a biopower facility in Southern Illinois. A biomass producer survey and linear programming tool will be designed and implemented to collect information for the analysis.

**Public Beliefs and Attitudes Concerning Wind Farms in Central Illinois**

08I-005-2-ISU

*Randy Winter**Illinois State University**Agriculture***Current Funding:** N/A (received no-cost extension)

Internal-ISU

1-year

**Description:** This study will assess the beliefs and attitudes of the general public on the development of wind farms in Central Illinois. Results will assist wind energy developers address the appropriate concerns of the general public and potentially could lead to a better relationship between the companies and the communities in which they operate.

**YouthWorks: Youth Leading Rural Communities' Economic Revitalization**

07I-001-2-SEN

*Laurie Kramer*  
*Joseph Pleck*  
*Angela Wiley*  
*Aaron Ebata*

*University of Illinois at Urbana-Champaign*  
*University of Illinois at Urbana-Champaign*  
*University of Illinois at Urbana-Champaign*  
*University of Illinois at Urbana-Champaign*

*Human and Community Development*  
*Human and Community Development*  
*Human and Community Development*  
*Human and Community Development*

**Current Funding:** \$0

Sentinel-UIUC

3-year

**Description:** This research builds on current USDA-NRI funded research to promote the further development, evaluation, and dissemination of YouthWorks, a system of interrelated interventions designed for increasing the number of competent young adults in the Illinois agricultural and entrepreneurial systems, and for enhancing local youths' commitment and future contributions to their community.

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# AGRICULTURAL PRODUCTION SYSTEMS

**OBJECTIVE:** Grow Illinois agriculture by increasing efficiency, marketability, and acceptance of Illinois agriculture on the farm to meet changing world demand for food, energy, and other agricultural products through research and education.

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**A Comparative Analysis of the Average Daily Gain and Feed Efficiency of Sheep and Goats**

08I-002-3-WIU

*Mark Hoge*

*Western Illinois University*

*Agriculture*

**Current Funding:** N/A (received no-cost extension)

Internal-WIU

1-year

**Description:** This research will provide guidance to producers so they may compare genetics and make directed breeding decisions for their enterprise.

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**A New Approach in Deciphering the Interaction Between SDS and SCN**

08I-006-3-SIUC

*Jason Bond*

*Southern Illinois University Carbondale*

*Plant, Soil and Agricultural Systems*

*Ahmad Fakhoury*

*Southern Illinois University Carbondale*

*Plant, Soil, and Agricultural Systems*

**Current Funding:** \$20,000

Internal-SIUC

2-year

**Description:** This project will elucidate some aspects of the complex interaction between soybean sudden death syndrome (SDS) and soybean cyst nematode (SCN), which will aid development of cultivars with durable resistance to both problems. Immediate objectives will use new tools to investigate the role of SCN in soybean root penetration by the SDS fungus.

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**A Novel Method for Disease Control in Livestock: Distillers Dried Grains with Solubles and Other Fibrous Feeds**

07I-007-3-SEN

*James Pettigrew*

*University of Illinois at Urbana-Champaign*

*Animal Sciences*

**Current Funding:** \$60,000

Sentinel-UIUC

3-year

**Description:** Evaluate the impact of dietary distillers dried grains with solubles on young pigs experimentally infected with *Escherichia coli* and on young chicks challenged with the coccidial species *Eimeria acervulina*.

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**Can a Herb Restore Performance in Fescue-Fed Cattle?**

08I-010-3-SIUC

*Karen Jones*

*Southern Illinois University Carbondale*

*Animal Science, Food and Nutrition*

*Rebecca Atkinson*

*Southern Illinois University Carbondale*

*Animal Science, Food and Nutrition*

**Current Funding:** N/A (received no-cost extension)

Internal-SIUC

1-year

**Description:** Fescue toxicosis, which induces deleterious effects in grazing livestock species, can be ameliorated by using the drug domperidone. While this approach requires FDA clearance, use of the herb *Cnicus benedictus*, may not. This herb may have properties necessary to combat fescue toxicosis. Our project will provide initial evaluations of efficacy by *C. benedictus* to reverse toxicosis symptoms.

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**Comparison and Evaluation of Sow Housing Options During Gestation**

09E-069-3

*Janeen Salak-Johnson*

*University of Illinois at Urbana-Champaign*

*Agricultural, Consumer and Environmental Sciences*

*Paul Walker*

*Illinois State University*

*Agriculture*

**Current Funding:** \$46,500

External

3-year

**Description:** The long range goal of this proposal is to design, optimize, and implement alternative housing and management systems that will enhance sow well-being while sustaining productivity and profitability of swine production in Illinois.

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<b>Consumer Attitudes and Expectations Towards Farm Animal Welfare</b>		07I-005-3-ISU	
<i>Aaron Moore</i>	<i>Illinois State University</i>	<i>Agriculture</i>	
<b>Current Funding:</b>	N/A (received no-cost extension)	Internal-ISU	1-year
<b>Description:</b>	This study will develop and test the use of survey instruments and interview techniques to ascertain how consumers conceptualize farm animal welfare and identify consumer expectations for welfare-friendly livestock production.		
<b>Development and Evaluation of a Value-Added Feedstuff Using Distiller's Grains</b>		06E-001-3	
<i>Paul Walker</i> <i>Larry Berger</i> <i>Gary Apgar</i>	<i>Illinois State University</i> <i>University of Illinois at Urbana-Champaign</i> <i>Southern Illinois University Carbondale</i>	<i>Agriculture</i> <i>Animal Sciences</i> <i>Animal Science, Food and Nutrition</i>	
<b>Current Funding:</b>	N/A (received no-cost extension)	External	1-year
<b>Description:</b>	This study uses extrusion technology to combine wet distiller's grains with either whole soybeans or soybean meal to develop a value-added feed for swine and cattle. It includes digestibility trials and feeding trials with both swine and cattle.		
<b>Development and Evaluation of High Efficiency Flexible Intelligent Farming Tools: Phase I - Autonomous Weed Control</b>		07I-014-3-SEN	
<i>Tony Grift</i>	<i>University of Illinois at Urbana-Champaign</i>	<i>Agricultural and Biological Engineering</i>	
<b>Current Funding:</b>	\$60,000	Sentinel-UIUC	3-year
<b>Description:</b>	Develop robotic hardware, networking capabilities, and software algorithms necessary for optimal weed management within a variety of conventional and alternative cropping systems.		
<b>Effect of Distiller's Grains on Beef Cow Dystocia and Conception</b>		08E-010-3	
<i>Rebecca Atkinson</i> <i>Paul Walker</i> <i>Karen Jones</i>	<i>Southern Illinois University Carbondale</i> <i>Illinois State University</i> <i>Southern Illinois University Carbondale</i>	<i>Animal Science, Food and Nutrition</i> <i>Agriculture</i> <i>Animal Science, Food and Nutrition</i>	
<b>Current Funding:</b>	\$122,806 (total funding - \$115,248 in FY08; \$7,558 in FY09)	External	2-year
<b>Description:</b>	Increasing levels of distiller's grains will be fed to winter-calving cattle to determine the optimum inclusion level of distiller's grains that can be fed without negatively effecting reproduction.		
<b>Effect of Variability in Gestation Stall Micro-Environment on Sow Well-Being, Physiology, and Productivity</b>		07I-005-3-SEN	
<i>Robert Knox</i>	<i>University of Illinois at Urbana-Champaign</i>	<i>Animal Sciences</i>	
<b>Current Funding:</b>	\$55,000	Sentinel-UIUC	3-year
<b>Description:</b>	A research facility will be created with capability for advanced control and measurement systems using sensors that will simulate microenvironment variations in light intensity and thermal zones similar to those found in commercial swine gestation buildings. Physiology, behavior, and reproductive efficiency of the sow will be assessed in this environment.		
<b>Enhancing Soybean Plant Resistance to Soybean Rust via Genetic Engineering</b>		09E-077-3	
<i>Vera Lozovaya</i> <i>Glen Hartman</i> <i>Jack Widholm</i>	<i>University of Illinois at Urbana-Champaign</i> <i>University of Illinois at Urbana-Champaign</i> <i>University of Illinois at Urbana-Champaign</i>	<i>Crop Sciences</i> <i>Crop Sciences</i> <i>Crop Sciences</i>	
<b>Current Funding:</b>	\$60,450	External	2-year
<b>Description:</b>	Critical targets for genetic engineers and breeders aimed at rust resistance will be identified by correlation rust disease development with metabolic changes in leaves of inoculated plants of different genotypes including genetically engineered lines.		

<b>Estimation of Soybean Cyst Nematode Genome Diversity: A Prelude to Association Mapping</b>		08I-010-3-SEN	
<i>Kris Lambert</i> <i>Terry Niblack</i> <i>Leslie Domier</i>	<i>University of Illinois at Urbana-Champaign</i> <i>University of Illinois at Urbana-Champaign</i> <i>University of Illinois at Urbana-Champaign</i>	<i>Crop Sciences</i> <i>Crop Sciences</i> <i>Crop Sciences</i>	
<b>Current Funding:</b>	\$60,000	Sentinel-UIUC	2-year
<b>Description:</b>	Investigators will (1) perform population genetic analysis of the soybean cyst nematode genome, and (2) develop a soybean cyst nematode biodiversity collection.		
<b>Identification of Pathogen-specific Apple Genes through Transcriptome Analysis during Interaction with the Fire Blight Pathogen <i>Erwinia amylovora</i></b>		08I-020-3-SEN	
<i>Youfu "Frank" Zhao</i> <i>Schuyler Korban</i>	<i>University of Illinois at Urbana-Champaign</i> <i>University of Illinois at Urbana-Champaign</i>	<i>Crop Sciences</i> <i>Natural Resources and Environmental Sciences</i>	
<b>Current Funding:</b>	\$45,000	Sentinel-UIUC	3-year
<b>Description:</b>	Investigators will (1) characterize the resistance response of apple to fire blight disease in terms of global gene expression and, thereby, identify new opportunities for improving fire blight resistance in apple; and (2) develop biotechnology strategies, such as RNAi, to control this major disease of apples and pears by knocking the expression of genes associated with pathogenicity.		
<b>Impact of Distiller Grain and Genetics on Beef Quality</b>		08E-019-3	
<i>Larry Berger</i>	<i>University of Illinois at Urbana-Champaign</i>	<i>Animal Sciences</i>	
<b>Current Funding:</b>	\$113,829 (total funding - provided in FY08)	External	2-year
<b>Description:</b>	Increasing supplies of distillers grains will replace corn in feedlot diets. The objective is to determine the effect of distillers grains level and form on beef quality grade and consumer acceptance.		
<b>Impact of Fermented Soybeans on Phosphorous Absorption in Weaned Pigs</b>		07I-008-3-ISU	
<i>Kerry Tudor</i> <i>Bryon Wiegand</i>	<i>Illinois State University</i> <i>Illinois State University</i>	<i>Agriculture</i> <i>Agriculture</i>	
<b>Current Funding:</b>	N/A (received no-cost extension)	Internal-ISU	1-year
<b>Description:</b>	In this study two nursery pig diets will be fed to weaned pigs in a replicated experiment. The control diet will contain standard soybean meal and the other will contain fermented soybean meal.		
<b>Improving Soybean Yield and Seed N Content by a Novel Inoculation Strategy</b>		08I-013-3-SIUC	
<i>Brian Klubek</i> <i>Chiun-Kang Hsu</i>	<i>Southern Illinois University Carbondale</i> <i>Southern Illinois University Carbondale</i>	<i>Plant, Soil and Agricultural Systems</i> <i>Plant, Soil, and Agricultural Systems</i>	
<b>Current Funding:</b>	\$10,000	Internal-SIUC	3-year
<b>Description:</b>	Inoculation of soybean with superior nitrogen-fixing <i>Bradyrhizobium japonicum</i> strains generally is not recommended unless fields have been idle for at least five years. Successful inoculation will require a novel approach that favors nodule formation by these superior strains of <i>B. japonicum</i> . This research will evaluate potential to enhance this targeted root colonization by: (1) reducing nodulation by native bradyrhizobia through use of antibiotic-producing <i>Streptomyces</i> ; (2) enhancing infection and nodulation of developing soybean roots by plant growth promoting rhizobacteria (PGPR); and (3) employing novel carriers to insure viability of the applied inocula and provide a physical barrier to the native microflora.		

**Initiative for Low-input Apple Production in Illinois**

06I-003-3-SEN

*Schuyler Korban**University of Illinois at Urbana-Champaign**Natural Resources and Environmental Sciences**Mosbah Kushad**University of Illinois at Urbana-Champaign**Natural Resources and Environmental Sciences**Richard Weinzierl**University of Illinois at Urbana-Champaign**Crop Sciences**Mohammad Babadoost**University of Illinois at Urbana-Champaign**Crop Sciences**Michael Mazzocco**University of Illinois at Urbana-Champaign**Agricultural and Consumer Economics***Current Funding:** N/A (received no-cost extension)

Sentinel-UIUC

3-year

**Description:** The overall goal of this initiative is to develop a low-input production system for the Illinois apple industry that minimizes pesticide use coupled with economic and marketing strategies for increasing profit and diversifying income.**Integrated Genomic Biology in Beef Cattle**

07I-010-3-SEN

*Dan Faulkner**University of Illinois at Urbana-Champaign**Animal Sciences***Current Funding:** \$46,000

Sentinel-UIUC

3-year

**Description:** Investigators will obtain estimates of genetic parameters (i.e., heritability and genetic correlation) for all traits measured including the unique measurement of individual feed intake, feed efficiency, residual feed efficiency, and tenderness. Results will aid producers and researchers accurately predict the potential for genetic improvement on individual and multiple traits simultaneously. The relationship between heterosis and breed composition will be studied and these results will aid producers and researchers identify the best or optimal breed composition for all traits measured. Genetic x environment interactions will be assessed and an evaluation of residual feed efficiency on subsequent performance of heifer calves will be conducted.**Micropropagation Techniques for Wintergreen (*Gaultheria Procumbens*)**

08I-004-3-WIU

*Marietta Loehrlein**Western Illinois University**Agriculture***Current Funding:** N/A (received no-cost extension)

Internal-WIU

1-year

**Description:** This research will examine the ability to grow and propagate wintergreen using micropropagation techniques.**Multidisciplinary Research and Discovery Program to Convert Renewable Plant/Crop Biomass into Renewable Fuels and Chemicals**

06I-001-3-SEN

*Hans Blaschek**University of Illinois at Urbana-Champaign**Office of Research**Martin Bohn**University of Illinois at Urbana-Champaign**Crop Sciences***Current Funding:** N/A (received no-cost extension)

Sentinel-UIUC

3-year

**Description:** This research initiative involves a diverse, multidisciplinary group of scientists working together to integrate and focus research on overcoming problems related to the conversion of biomass to renewable fuels and chemicals.**Nitrogen Rates for Grazing Corn**

08I-003-3-WIU

*Kenneth Nimrick**Western Illinois University**Agriculture***Current Funding:** N/A (received no-cost extension)

Internal-WIU

1-year

**Description:** This project will examine nitrogen fertilizer rates for corn destined for grazing in the green leaf stages.**Pioneering Bionanosensing Systems for Use as a Decision Support Tool for Soybean Disease Management**

07I-015-3-SEN

*Linda Kull**University of Illinois at Urbana-Champaign**National Soybean Research Laboratory***Current Funding:** N/A (received no-cost extension)

Sentinel-UIUC

2-year

**Description:** A decision support tool will be developed to assist soybean producers to define if/when to apply fungicides for management of soybean rust.

**Soybean Health: Rust Gene Discovery Initiative**

07I-016-3-SEN

*Schuyler Korban**University of Illinois at Urbana-Champaign**Natural Resources and Environmental Sciences***Current Funding:** \$60,000

Sentinel-UIUC

3-year

**Description:** A search for candidate genes associated with soybean rust resistance will be undertaken. High throughput screening of these candidate genes will be accomplished. The functionality of these genes and their role in rust resistance in soybean plants will be confirmed by developing knock-out mutants using RNAI technology.

**The Sentinel Crop Gene Identification Project**

06I-005-3-SEN

*Lila Vodkin**University of Illinois at Urbana-Champaign**Crop Sciences**Gustavo Caetano-Anolles**University of Illinois at Urbana-Champaign**Crop Sciences**Matthew Hudson**University of Illinois at Urbana-Champaign**Crop Sciences**Steve Moose**University of Illinois at Urbana-Champaign**Crop Sciences***Current Funding:** N/A (received no-cost extension)

Sentinel-UIUC

3-year

**Description:** The goals of this project are to develop, test, and implement new approaches to determine the biological functions for corn and soybean crop-specific genes (CSGs). These approaches will integrate the use of bioinformatics, molecular biology, and genetics to add functional information to genomes and evaluate the potential of CSGs in crop improvement.

**Toward Reducing Soybean Yield Losses Caused by Ozone**

07I-009-3-SEN

*Brian Diers**University of Illinois at Urbana-Champaign**Crop Sciences***Current Funding:** \$55,000

Sentinel-UIUC

3-year

**Description:** Physiological and molecular tools will be used to identify the most ozone-tolerant soybean germplasm. Tools will be tested by evaluating diverse accessions from the USDA Soybean Germplasm Collection.

**Towards a System Biology Approach to Networks for Metabolic Engineering and Crop Improvement of Soybeans**

08I-002-3-SEN

*Gustavo Caetano-Anolles**University of Illinois at Urbana-Champaign**Crop Sciences**Lila Vodkin**University of Illinois at Urbana-Champaign**Crop Sciences**Jay Mittenthal**University of Illinois at Urbana-Champaign**Cell and Developmental Biology***Current Funding:** \$60,000

Sentinel-UIUC

3-year

**Description:** Investigators will (1) develop a novel phylogenomic strategy that will delineate proteomes as evolutionary mosaics of protein domains and trace these functional units in metabolic networks; (2) dissect enzyme recruitment in metabolic networks; (3) identify transcriptional factors and metabolic enzymes controlling oil content and fatty acid composition based on bioinformatic, transcriptomic, and metabolomic analysis; and (4) link transcript and metabolic networks, and determine functions of individual genes involved in soybean oil production.

# HUMAN NUTRITION AND FOOD SAFETY

**OBJECTIVE:** Provide a nutritious, high-quality, safe, and secure food supply and enable consumers to make informed and healthful dietary choices.

## A Novel Method for Early Detection of Foreign Substances in Milk

09E-035-4

*Amer AbuGhazaleh*  
John Haddock  
Michael Hutjens  
Salam Ibrahim

*Southern Illinois University Carbondale*  
*Southern Illinois University Carbondale*  
*University of Illinois at Urbana-Champaign*  
*Other*

*Animal Science, Food and Nutrition*  
*Microbiology*  
*Animal Sciences*  
*Family and Consumer Sciences*

**Current Funding:** \$54,037

External 2-year

**Description:** This proposal looks at the effectiveness of using lactic acid bacteria as an effective, reliable, simple and rapid tool to identify adulterated milk. This project would also try to develop a color-based kit to detect contaminated milk.

## Adipotoxicity Biomarker Discovery Using a Canine Diet-Induced Obesity Model

07I-003-4-SEN

*Kelly Swanson*

*University of Illinois at Urbana-Champaign*

*Animal Sciences*

**Current Funding:** N/A (received no-cost extension)

Sentinel-UIUC 2-year

**Description:** Investigators will identify changes in adipose and blood mononuclear cell gene expression profiles as weight gain and adipotoxicity develop in a canine diet-induced obesity model. Key gene-metabolite relationships associated with weight gain and adipotoxicity will be identified by correlating mRNA abundance with physiological end-points like adipose histological outcomes and blood metabolites.

## Defining Protein Needs and Carbohydrate Tolerance for Adult Health

07I-011-4-SEN

*Manabu T. Nakamura*  
Donald K. Layman

*University of Illinois at Urbana-Champaign*  
*University of Illinois at Urbana-Champaign*

*Food Science and Human Nutrition*  
*Food Science and Human Nutrition*

**Current Funding:** \$55,000

Sentinel-UIUC 3-year

**Description:** Determine (1) if the amino acid, leucine, is the regulatory signal for muscle protein synthesis and a marker for adult protein requirements, (2) if consistent macronutrient ratios across meals will optimize skeletal muscle protein synthesis and stabilize glycemic regulation, and (3) the relative impact of increased dietary protein vs. moderation of dietary carbohydrate quantity and quality on improving glucose homeostasis.

## Feeding the Human Gut Microbiota with Health-enhancing Carbohydrates

08I-008-4-SEN

*David Hernot*  
*George Fahey, Jr*  
*Kelly Swanson*

*University of Illinois at Urbana-Champaign*  
*University of Illinois at Urbana-Champaign*  
*University of Illinois at Urbana-Champaign*

*Animal Sciences*  
*Animal Sciences*  
*Animal Sciences*

**Current Funding:** \$57,000

Sentinel-UIUC 2-year

**Description:** Investigators will (1) evaluate the nutritional profile, fermentation profile, and prebiotic potential of various whole grains and whole grain components and determine the effects of processing on these outcomes; (2) determine the prebiotic potential and gas production capacity of oligosaccharide substrates and their blends; and (3) evaluate novel carbohydrates currently used in food systems as thickeners, stabilizers, and viscosity-enhancing agents for their potential to enhance large bowel health.

## Folate Produced in the Large Intestine by Probiotics can Mediate Colorectal Cancer Development Via Epigenetic Mechanisms

07I-013-4-SEN

*Michael Miller*

*University of Illinois at Urbana-Champaign*

*Food Science and Human Nutrition*

**Current Funding:** \$55,000

Sentinel-UIUC 3-year

**Description:** Determine whether folate produced by probiotic bifidobacteria in the large intestine of humans can prevent the development of colorectal cancer.

**Novel Cardiovascular Benefits of a Diet Enriched in Both Soy Oil and Soy Isoflavones**

08E-047-4

*William Banz  
Allan Higginbotham  
Kolapo M. Ajuwon**Southern Illinois University Carbondale  
Southern Illinois University Carbondale  
Purdue University**Animal Science, Food and Nutrition  
Animal Science, Food and Nutrition  
Animal Sciences***Current Funding:** \$131,503 (total funding - \$125,260 in FY08; \$6,243 in FY09)

External

3-year

**Description:** Cardiovascular disease remains the top killer in the U.S. Because soy oil is enriched in unsaturated fatty acids but low in isoflavone, we want to investigate novel cardiovascular health benefit of a combination of soy oil and soy isoflavone in a diet.**The STRONG Kids Project: Cross-disciplinary Investigation of Media Effects on Childhood Obesity and Health within Family and Community Contexts**

08I-007-4-SEN

*Kristen Harrison  
Kelly Bost  
Brent McBride  
Sharon Donovan**University of Illinois at Urbana-Champaign  
University of Illinois at Urbana-Champaign  
University of Illinois at Urbana-Champaign  
University of Illinois at Urbana-Champaign**Speech Communication  
Human and Community Development  
Human and Community Development  
Food Science and Human Nutrition***Current Funding:** \$60,000

Sentinel-UIUC

3-year

**Description:** Investigators will (1) survey the status of food marketing to children and families by gauging child and parent media exposure and by mapping the neighborhood retail food store environment; (2) assess the relationship between children's media exposure and their nutritional knowledge and reasoning; (3) study parent-child relationships and conversation styles as mediators and moderators of the relations between family practices, media exposure, and children's health behaviors and cognitions; and (4) test the links between family media literacy, health literacy, and childhood obesity, weight control, and body image among low-income and other families.**Tomatoes and Broccoli for the Reduction of Prostate Cancer in Illinois African-American Men**

07I-006-4-SEN

*John Erdman**University of Illinois at Urbana-Champaign**Food Science and Human Nutrition***Current Funding:** \$55,000

Sentinel-UIUC

3-year

**Description:** Increase prostate cancer awareness among African-American men through enhanced screening. Develop research-based recommendations for consumption of vegetables and vegetable combinations optimized for prostate cancer prevention. Develop research-based continuing education for health professionals in Illinois. Increase availability of these vegetable foods among African-American men in Illinois.

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# NATURAL RESOURCES AND ENVIRONMENT

**OBJECTIVE:** Foster environmental stewardship and the sustainable use of natural resources in Illinois.

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**A Watershed-Scale Assessment of the Water Quality Impacts of Riparian Buffers in Southern Illinois** *071-013-5-SIUC*

*Jon Schoonover* *Southern Illinois University Carbondale* *Forestry*  
*Karl Williard* *Southern Illinois University Carbondale* *Forestry*

**Current Funding:** \$20,000 Internal-SIUC 3-year

**Description:** Riparian ecotones are critically important transition areas along stream margins, as they provide the last opportunity for nutrient, sediment, and chemical attenuation before being transported to streams. These riparian buffers can be increasingly useful in southern Illinois, where agricultural fields commonly are not tile drained. This project will assess riparian zone vegetation for its sediment, nutrient, and fecal coliform attenuation performance at the watershed scale in southern Illinois agricultural watersheds.

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**Costs and Environmental Benefits of Conservation Tillage in the Lower Illinois Basin** *061-002-5-SIUC*

*Jeffrey Beaulieu* *Southern Illinois University Carbondale* *Agribusiness Economics*

**Current Funding:** N/A (received no-cost extension) Internal-SIUC 3-year

**Description:** Study objectives are (1) to develop and statistically estimate an econometric model for evaluating responsiveness of conservation tillage adoption to economic factors, and (2) to use this model to assess economic, tillage intensity, and environmental consequences of changes in economic factors for the Lower Illinois Basin.

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**Environmental Effects of Swine Manure Application to Non-corn Crops** *081-002-5-ISU*

*Kenneth Smiciklas* *Illinois State University* *Agriculture*  
*Paul Walker* *Illinois State University* *Agriculture*

**Current Funding:** N/A (received no-cost extension) Internal-ISU 1-year

**Description:** This project will evaluate the separated fractions of liquid swine manure (separated effluent and composted solids) to safely utilize animal manure while ensuring minimal disruption to the soil environment. It is hoped that the liquid effluent can be applied to soils without a corresponding large buildup in soil nutrient levels for phosphorous values.

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**Establishing Groundcover Management Systems for Sustainable Vineyards** *081-018-5-SIUC*

*Bradley Taylor* *Southern Illinois University Carbondale* *Plant, Soil and Agricultural Systems*  
*Alan Walters* *Southern Illinois University Carbondale* *Plant, Soil, and Agricultural Systems*  
*Bryan Young* *Southern Illinois University Carbondale* *Plant, Soil and Agricultural Systems*

**Current Funding:** N/A (received no-cost extension) Internal-SIUC 1-year

**Description:** The goal is to develop sustainable alternatives for vineyard floor management at a critical stage of the industry's development. Ground cover management systems that reduce herbicide usage soil erosion, increase water infiltration and retention and improve vine vigor and plant water use efficiency as well as suppress nematodes and weeds will be tested under the range of soil conditions found in the state. The proposed research will determine the effect of alternative vineyard floor management systems using non-competitive plant species in established, mature vineyards. The most successful treatments will be demonstrated to growers through publications, presentations, and field days.

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<b>Evaluation of Land Application Systems for Swine Manure to Reduce NPS Pollution</b>		08E-001-5	
<i>Paul Walker</i> <i>Robert Rhykerd</i> <i>Timothy Kelley</i> <i>Walton Kelly</i> <i>Duane Friend</i>	<i>Illinois State University</i> <i>Illinois State University</i> <i>Illinois State University</i> <i>Illinois State Water Survey</i> <i>University of Illinois Extension</i>	<i>Agriculture</i> <i>Agriculture</i> <i>Health Sciences</i>	
<b>Current Funding:</b>	\$137,835 (total funding - \$124,869 in FY08; \$12,966 in FY09)	External	3-year
<b>Description:</b>	Evaluates surface and sub-surface irrigation of separated effluent compared to injection of unprocessed slurry on non-point source pollution.		
<b>Exploring the Economic and Environmental Possibilities of Giant Cane as a Best Management Practice</b>		08I-017-5-SIUC	
<i>Jon Schoonover</i> <i>James Zaczek</i>	<i>Southern Illinois University Carbondale</i> <i>Southern Illinois University Carbondale</i>	<i>Forestry</i> <i>Forestry</i>	
<b>Current Funding:</b>	\$20,000	Internal-SIUC	3-year
<b>Description:</b>	This project will create a fully functional and experimental giant cane nursery at SIUC, which will facilitate further refinement of planting methods, fertilization treatments, and soil amendments for this species. Specific objectives include: (1) establishing and maintaining sustainable sources of giant cane for Illinois restoration projects; (2) exploring genotypic variation among giant cane sources to match varieties to planting sites; and (3) establishing a long-term riparian buffer research/demonstration site at SIUC.		
<b>Forage Radish: An Alternative Cover Crop for Organic Farms in Illinois</b>		07I-004-5-WIU	
<i>Joel Gruver</i>	<i>Western Illinois University</i>	<i>Agriculture</i>	
<b>Current Funding:</b>	N/A (received no-cost extension)	Internal-WIU	1-year
<b>Description:</b>	This project will evaluate opportunities to enhance soil and water quality on organic farms by integrating forage radish within diversified cash grain production systems.		
<b>Identifying Trends in Soil Profile Nutrient Resources in Illinois</b>		09E-085-5	
<i>Harold Reetz</i>	<i>International Plant Nutrition Institute and Foundation for Agronomic Research</i>		
<b>Current Funding:</b>	\$46,500	External	2-year
<b>Description:</b>	This project will compare soil tests of archived samples from research farms and soil survey work to contemporary soil tests from the same locations. The comparison will help determine if management practices are depleting soil fertility resources at one or more depths in the soil profile.		
<b>Implementation of No-tillage Production Practices for Jack-o-lantern Pumpkins</b>		06I-008-5-SIUC	
<i>Alan Walters</i>	<i>Southern Illinois University Carbondale</i>	<i>Plant, Soil, and Agricultural Systems</i>	
<b>Current Funding:</b>	N/A (received no-cost extension)	Internal-SIUC	3-year
<b>Description:</b>	The major limitation for implementing no-tillage practices in vegetable production is weed management. Improved weed management practices must be developed before no-tillage systems will be readily adopted. Implementing no-tillage vegetable production practices would be of tremendous benefit not only to Illinois vegetable growers but also to the future of Illinois agriculture through soil conservation efforts.		

**Integrated Management of Summer Diseases of Apples**

06E-015-5

*Mohammad Babadoost  
Sayed Islam  
Mosbah Kushad**University of Illinois at Urbana-Champaign  
University of Illinois at Urbana-Champaign  
University of Illinois at Urbana-Champaign**Crop Sciences  
Crop Sciences  
Natural Resources and Environmental  
Sciences***Current Funding:** N/A (received no-cost extension)

External

3-year

**Description:** This research will evaluate the effectiveness of two disease-warning systems, an organic fungicide, and a reduced-risk fungicide on controlling apple diseases. It also will compare economics of the new IPM strategies with the conventional practices.**Thermochemical Conversion Process to Produce Oil from Various Types of Livestock Manure**

07E-054-5

*Yuanhui Zhang  
Ted Funk  
Kim Ocfemia**University of Illinois at Urbana-Champaign  
University of Illinois at Urbana-Champaign  
University of Illinois at Urbana-Champaign**Agricultural and Biological Engineering  
Agricultural and Biological Engineering  
Agricultural and Biological Engineering***Current Funding:** \$143,784 (total funding - provided in FY07)

External

3-year

**Description:** The research group has developed a thermochemical conversion process (TCC) and successfully converted up to 70% fresh swine manure into oil. Researchers will investigate the feasibility of converting other types of livestock manure into oil using this TCC process.

# STRATEGIC RESEARCH INITIATIVES

C-FAR's Strategic Research Initiative (SRI) Program implements a targeted, multidisciplinary, and multi-institutional team approach to addressing major concerns and opportunities for Illinois' food, agriculture, and related industry and consumers. This unique approach brings together scientists from Illinois' universities and other research entities to collaborate for a common cause.



**Biomass Energy Crops for Power and Heat Generation in Illinois: Diversifying Cropping, Improving Energy and Benefiting the Environment**  
 (This SRI formally ended on June 30, 2008, however, project components were granted a no-cost extension to complete the work)

04-SRI-036  
 (Main)

<b>Stephen Long</b>	<b>University of Illinois at Urbana-Champaign</b>
German Bollero	University of Illinois at Urbana-Champaign
Mark David	University of Illinois at Urbana-Champaign
Tony Grift	University of Illinois at Urbana-Champaign
Jack Juvik	University of Illinois at Urbana-Champaign
Madhu Khanna	University of Illinois at Urbana-Champaign
Gregory McIsaac	University of Illinois at Urbana-Champaign
Anne Heinze Silvis	University of Illinois at Urbana-Champaign
Lei Tian	University of Illinois at Urbana-Champaign
Thomas Voigt	University of Illinois at Urbana-Champaign
Michelle Wander	University of Illinois at Urbana-Champaign
Jack Widholm	University of Illinois at Urbana-Champaign
Yuanhui Zhang	University of Illinois at Urbana-Champaign

**Crop Sciences/Plant Biology**  
 Crop Sciences  
 Natural Resources and Environmental Sciences  
 Agricultural and Biological Engineering  
 Natural Resources and Environmental Sciences  
 Agricultural and Consumer Economics  
 Natural Resources and Environmental Sciences  
 Human and Community Development  
 Agricultural and Biological Engineering  
 Natural Resources and Environmental Sciences  
 Natural Resources and Environmental Sciences  
 Crop Sciences  
 Agricultural and Biological Engineering

<b>Current Funding:</b>	N/A (received no-cost extension)	SRI	5-year
Total funding for life of SRI:	\$1,185,088		

**Description:** This research initiative aims to provide Illinois with the foundation and technology leadership for large-scale cultivation of biomass crops. Researchers will focus on the use of Miscanthus, a perennial rhizomatous grass, as a potential renewable energy source for Illinois and profitable alternative crop for Illinois producers.

**Sub-project #1: Agronomic Trials**

04-SRI-036

**Stephen Long**                      **University of Illinois at Urbana-Champaign**

**Crop Sciences/Plant Biology**

**Current Funding:**              N/A (received no-cost extension)              SRI

**Sub-project #2: Water Resource Implications**

04-SRI-036A

**Mark David**                      **University of Illinois at Urbana-Champaign**

**Natural Resources and Environmental Sciences**

**Gregory F. McIsaac**              **University of Illinois at Urbana-Champaign**

**Natural Resources and Environmental Sciences**

**Current Funding:**              N/A (received no-cost extension)              SRI

**Sub-project #3: Miscanthus Breeding and Improvement**

04-SRI-036B

**John Juvik**                      **University of Illinois at Urbana-Champaign**

**Natural Resources and Environmental Sciences**

**Current Funding:**              N/A (received no-cost extension)              SRI

**Sub-project #4: Economic Analyses**

04-SRI-036C

**Madhu Khanna**                      **University of Illinois at Urbana-Champaign**

**Agricultural and Consumer Economics**

**Current Funding:**              N/A (received no-cost extension)              SRI

**Sub-project #5: Social Acceptability**

04-SRI-036D

**Anne Heinze Silvis**              **University of Illinois at Urbana-Champaign**

**Human and Community Development**

**Current Funding:** N/A (received no-cost extension) SRI

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**Sub-project #6: Propagating and Eradicating *Miscanthus x giganteus*** 04-SRI-036F

*Thomas Voigt* *University of Illinois at Urbana-Champaign* *Natural Resources and Environmental Sciences*

**Current Funding:** N/A (received no-cost extension) SRI

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**Sub-project #7: Carbon Sequestration and Greenhouse Gas Accounting** 04-SRI-036G

*Michelle Wander* *University of Illinois at Urbana-Champaign* *Natural Resources and Environmental Sciences*

**Current Funding:** N/A (received no-cost extension) SRI

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**Sub-project #9: Bioconversion** 04-SRI-036I

*Yuanhui Zhang* *University of Illinois at Urbana-Champaign* *Agricultural and Biological Engineering*

**Current Funding:** N/A (received no-cost extension) SRI

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**Illinois Livestock Integrated Focus Teams**

(This SRI formally ended on June 30, 2007, however, project components were granted a no-cost extension to complete the work)

04-SRI-020 **Area: 3**  
(Main)

<i>Michael Hutjens</i>	<i>University of Illinois at Urbana-Champaign</i>	<i>Animal Sciences</i>
<i>Edward N. Ballard</i>	<i>University of Illinois Extension</i>	
<i>Larry Berger</i>	<i>University of Illinois at Urbana-Champaign</i>	<i>Animal Sciences</i>
<i>Geoffrey Dahl</i>	<i>University of Florida (formerly of UIUC)</i>	<i>Animal Sciences</i>
<i>Phillip Eberle</i>	<i>Southern Illinois University Carbondale</i>	<i>Agribusiness Economics</i>
<i>Ted Funk</i>	<i>University of Illinois at Urbana-Champaign</i>	<i>Agricultural and Biological Engineering</i>
<i>Peter Goldsmith</i>	<i>University of Illinois at Urbana-Champaign</i>	<i>Agricultural and Consumer Economics</i>
<i>Richard Vogen</i>	<i>University of Illinois at Urbana-Champaign</i>	<i>Administration and Finance</i>
<i>Richard Wallace</i>	<i>University of Illinois at Urbana-Champaign</i>	<i>Veterinary Clinical Medicine</i>

**Current Funding:** N/A (received no-cost extension) SRI 4-year  
Total funding for life of SRI: \$368,167

**Description:** This SRI addresses the economic and social challenges facing Illinois' livestock industry. The initiative will focus on livestock facility siting in Illinois, using Illinois byproduct feeds in livestock feeding programs, pasture-based forage systems to sustain Illinois livestock producers, and animal identification for enhanced food quality and monitoring livestock health.

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**Sub-project #1: Technology Development** 04-SRI-020

*Michael Hutjens* *University of Illinois at Urbana-Champaign* *Animal Sciences*

**Current Funding:** N/A (received no-cost extension) SRI

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**Sub-project #4: Pasture Based Forage Systems to Sustain Illinois Livestock Producers** 04-SRI-020D

*Michael F. Hutjens* *University of Illinois at Urbana-Champaign* *Animal Sciences*

**Current Funding:** N/A (received no-cost extension) SRI

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*January 2009*