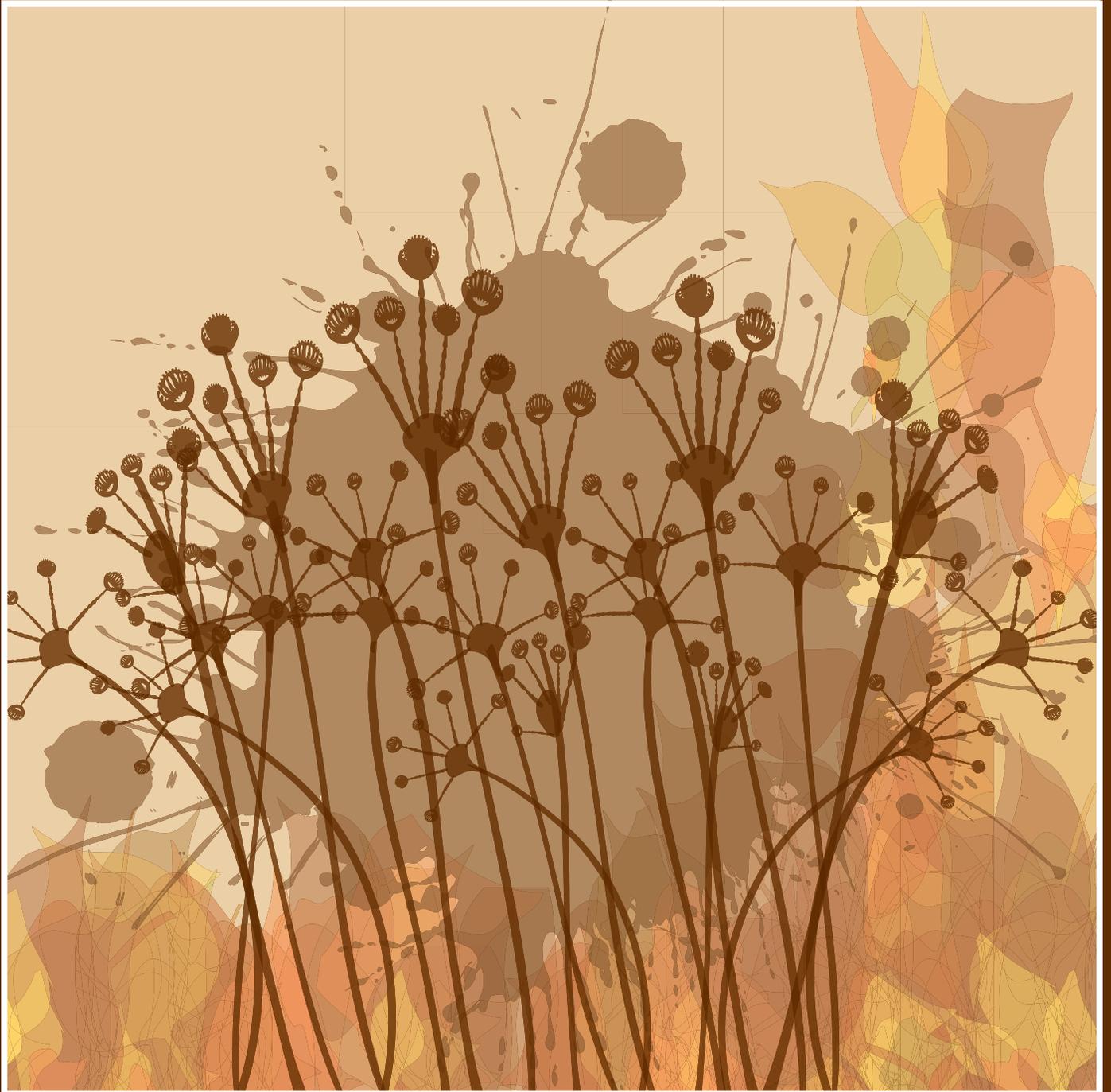




LEOPOLD CENTER
FOR SUSTAINABLE AGRICULTURE



2009 - 2010
ANNUAL REPORT

Table of contents

3	Transitions	16	Wallace Chair
4	Final Note from Jerry DeWitt	17	Practical Farmers of Iowa
5	DeWitt Retirement Celebration	18	Organic Programs
6	Staff and Advisory Board	20	Sustainable Agricultural Land Tenure
7	Financial Update	22	Grape and Wine Industry
8	Kirschenmann Activities	23	Drainage Water Research
9	Interim Director Appointed	24	Ecology Initiative
10	Spencer Award	28	Marketing and Food Systems Initiative
11	Shivvers Lecture	33	Policy Initiative
12	Keeney Lecture	34	Grass-Based Livestock Group
13	Iowa Learning Farms	35	Competitive Grant Programs
14	Short Takes GPSA Students		



Aldo Leopold (1887–1948), the conservationist, ecologist, and educator for whom the Center was named.



Mission

The Leopold Center was established by the Iowa Legislature as part of the Iowa Groundwater Protection Act of 1987. Its legislatively mandated goals are to identify and reduce negative environmental and socio-economic impacts of agricultural practices, contribute to the development of profitable farming systems that conserve natural resources, and cooperate with Iowa State University Extension to inform the public of new findings.

Vision

The Leopold Center for Sustainable Agriculture explores and cultivates alternatives that secure healthier people and landscapes in Iowa and the nation.

Information for this report was compiled by Leopold Center staff with the help of its researchers and educators, who are committed to improving Iowa agriculture and the lives of Iowans. | Photos by Leopold Center staff except where noted | Edited by Mary Adams | Design by julsdesign inc., ankeny, ia

Iowa State University does not discriminate on the basis of race, color, age, religion, national origin, sexual orientation, gender identity, sex, marital status, disability, or status as a U.S. veteran. Inquiries can be directed to the Director of Equal Opportunity and Diversity, 3280 Beardshear Hall, (515) 294-7612.



Transitions

anyone who has ever given birth to a baby has been through the stage of labor called “transition,” and knows that pretty much anything can happen then. The books tell you to be prepared for all sorts of sudden changes and unexpected occurrences. That was how life at the Leopold Center felt during the past fiscal year as we weathered an unsuccessful search for a new director while continuing to carry on our work for Iowa agriculture.

Happily, that wasn't the only transition in which we were participating. Sustainable agriculture students and practitioners, both in Iowa and nationally, continue to search for the solutions to problems that face agriculture. The Leopold Center has more than two decades of experience, research results, field demonstration data, and goodwill to contribute to the lively discussions. The Center this year provided support through programming and practical interaction for people:

- looking for new ways to grow and market food in Iowa,
- seeking different, healthier means to preserve and improve their land and water, and
- who want to learn how to farm as a wise and essential career choice.

The entrepreneurial spirit that permeates the local food movement offers many Iowans alternatives for making money and good use of the land at the same time. Increasing willingness to consider farming practices such as planting cover crops, grazing animals on highly erodible land, working to make waterways cleaner and less prone to flooding—these are just a few of the exciting conservation-based options that are looking more attractive to farmers all over the state.

Many of the practices the Leopold Center is investigating offer opportunities for conscientious, ecologically aware farmers with operations of all scales and sizes.

Within this annual report you'll see evidence of a wide variety of research and education projects and programs. Some are new, some have long-term effects to report, and others are assessing their mid-term results and looking for the next best step to achieving their goals. Since its inception, the Leopold Center has funded more than 425 competitive grants with more than \$18 million invested in Iowa agriculture's sustainable future.

Like any other long-running research and educational organization, we've been through transitions before. Some are easy, some are hard. Sometimes you look a lot different than when you started. Wherever this latest transition leads us, the Leopold Center staff and advisory board remain committed to the mission set out by the Iowa legislature in 1987—

...to identify and reduce negative environmental and socio-economic impacts of agricultural practices and contribute to the development of profitable farming systems that conserve natural resources.

Mary Adams
Annual report editor



Carver Award
Innovator in
ag manufacturing

2009 Distinguished Alumni



Jerald DeWitt
Carver Award

*Distinguished national
service in sustainable ag*



A final note from Jerry DeWitt

As my term as Leopold Center director drew to a close in late June 2010, I thought about all of those, in Iowa and throughout the country, who value the Center as I do. Even though my long-rumored departure was delayed by several months, it has been gratifying to have had the chance to talk with so many of you who care about the Leopold Center. I know that you share my profound respect for all that the Center has done for Iowa farmers and the advances that have been made in sustainable agriculture.

At my last advisory board meeting on June 3, I told the Center's board members how important their contributions are to keeping the Center on track. I appreciated their willingness to serve as volunteers representing a variety of stakeholders in the Center's future. I encouraged them to continue to work together as a cohesive voice for the Center. Divisiveness in agriculture will serve none of us well—we need to look for the common ground, the soil beneath our feet and the streams that water our fields.

I was privileged to be a member of the Center's very first advisory board, and attended the board's first meeting in August 1987. Two of the legislators who were the main forces behind the legislation that founded the Center, the Iowa Groundwater Protection Act, were at that meeting. They told the board that the Center was established to address issues dealing with the current and future issues of agriculture. They envisioned that the Center would serve as a model for an environmentally sensitive program of research and education. I am proud to have played a major part in that effort over the last two decades.

Jerry DeWitt





Jerry DeWitt's
farewell tour



ISU fetes DeWitt on his retirement

nearly 150 friends and colleagues of Jerry DeWitt honored him on the occasion of his retirement from Iowa State University December 5, 2009 at the Scheman Building. A social hour included music by the group Joyful Hearts and a slide show featuring DeWitt through the years (with many striking early images). Attendees could view a collection of DeWitt's farm life photos on display during the event. Following dinner, a lively program included remarks by College of Agriculture and Life Sciences Dean Wendy Wintersteen, who presented DeWitt with a piece of stone from the front steps of Curtiss Hall and a handsome tie for important occasions.

Jim Gulliford, executive director of the Soil and Water Conservation Society, wowed the audience with a witty speech in which he displayed some confusion as to exactly which retiring ISU administrator named "Jerry" he was there to honor. ISU Vice-Provost for Extension and Outreach Jack Payne shared some charming anecdotes about Jerry's childhood that he gleaned from talking with DeWitt's brother earlier in the evening. Jennifer Steffen, Leopold Center Advisory Board chair, took the opportunity to thank DeWitt for his many years of service to the Center as board member and director. Teresa Opheim, executive director of Practical Farmers of Iowa, and several of her staff members recited a litany of things they would miss about Jerry DeWitt. In an emotional goodbye speech, Ron Rosmann of Rosmann Family Farms recalled his 25-year friendship with DeWitt and his commitment to Iowa family farms.

DeWitt closed the program with thanks to his family, his fellow faculty members, the Leopold Center staff, and his ISU Extension colleagues (many of them joining him in retirement this year) who had made his time at ISU so rewarding. DeWitt reserved special praise for the many farmers he had met along the way who welcomed him as an Extension staff member and as a photographer, and inspired him to work for the betterment of family farms across the country.



Leopold Center Staff

*part-time or shared appointment **partial ISU Extension appointment

Jerry DeWitt**

Director

jdewitt@iastate.edu, *retired June 2010*

Frederick Kirschenmann*

Distinguished Fellow

leopold1@iastate.edu

Mary Adams

Outreach and Policy Coordinator

madams@iastate.edu

Corry Bregendahl*

Assistant Scientist

corry@iastate.edu

Carol Brown*

Communications Specialist

cbrown1@iastate.edu

Karen Jacobson

Administrative Specialist

kjacobso@iastate.edu

Beth Larabee

Program Assistant

blarabee@iastate.edu

Blue Maas

Secretary

bluemaas@iastate.edu

Laura Miller

Communications Specialist

lwmillr@iastate.edu

Jeri Neal

Ecological Systems and Research

Program Coordinator

wink@iastate.edu

Rich Pirog**

Associate Director and Marketing and

Food Systems Program Leader

rspirog@iastate.edu

Malcolm Robertson

Program Coordination and Outreach

malcolmr@iastate.edu



Leopold Center Advisory Board

*Board members who served only a portion of the fiscal year

Joe Colletti

Senior Associate Dean of Agriculture
and Life Sciences

Iowa State University*

Kelley Donham

Professor of Occupational
and Environmental Health

University of Iowa*

William Ehm

Administrator

Iowa Department of Natural Resources

Doug Gronau

Farmer

Iowa Farm Bureau Federation, Vail

Maynard Hogberg

Professor of Animal Science

Iowa State University

Erin Irish

Professor of Biological Sciences

University of Iowa

Laura Jackson

Professor of Biology

University of Northern Iowa

Susan Jutz

Farmer

Practical Farmers of Iowa, Solon

Paul Lasley

Professor of Rural Sociology

Iowa State University

Aaron Heley Lehman

Farmer

Iowa Farmers Union, Polk City

George Malanson

Professor of Geography

University of Iowa*

John Olthoff

Professor of Agriculture

Dordt College, Sioux Center

Jack Payne

Vice-President for Extension and
Outreach

Iowa State University*

Patrick Pease

Professor of Geography

University of Northern Iowa

Jim Penney

Agribusiness Association of Iowa, Ames

John Sellers, Jr.

Farmer

State Soil Conservation Committee,

Corydon

Jennifer Steffen

Farmer

District Soil and Water Commission,

Birmingham (chair)

Keith Summerville

Associate Dean and Associate Professor
of Environmental Science and Policy

Drake University

Maury Wills

Bureau Chief

Agricultural Diversification and Market
Development, Iowa Department of
Agriculture and Land Stewardship

Finances

in order to be more transparent, several changes have been made to the financial statements presented in this annual report. The financial information is for a two-year comparative period, the state Agriculture Management Account (AMA) receipts are presented on an accrual basis, and receipts and expenses on gifts received through the ISU Foundation are now included.

For the Years Ended June 30, 2010 and 2009

	2010	2009
Funds Received		
State AMA Receipts	\$1,658,429	\$2,059,500
ISU Allocations	439,945	587,663
Foundation Funds - Unrestricted	132,271	85,852
Foundation Funds - Restricted	41,045	2,575
Total Funds Received	<u>2,271,690</u>	<u>2,735,590</u>
Funds Expended		
Salaries and Benefits	764,037	717,818
Travel and Registration	23,529	16,348
Services and Information	57,319	83,076
Communications	23,546	3,137
Supplies	14,430	17,916
Utilities/Maintenance and Repair	1,881	1,781
Research Initiatives/Discretionary	40,538	38,795
Director Search	6,335	0
Total Funds Expended	<u>931,615</u>	<u>878,871</u>
Transfers Out		
Competitive Grants	1,254,789	913,446
Initiatives/Discretionary/Cost Share	60,000	55,431
Wallace Chair Support	20,000	20,000
PFI Partnership	50,000	50,000
LTAR Support	50,000	50,000
Grape and Wine Program	12,500	12,500
Water Quality Project	10,500	10,500
Energy Specialist	10,000	10,000
Drake Ag Law Land Stewardship Project	25,000	25,000
Graduate Assistantship Support - GPSA	20,590	20,590
Total Transfers Out	<u>1,513,379</u>	<u>1,167,467</u>
Increase/(Decrease) In Funds	(173,304)	689,252
Funds, Beginning of Year	1,561,240	871,988
Funds, End of Year	<u>\$1,387,936</u>	<u>\$1,561,240</u>
Competitive Grants AWARDED by Initiative		
Ecology	\$571,830	\$689,276
Policy	25,000	94,561
Marketing	487,551	459,883
Cross (XP)	97,000	106,500
Total	<u>\$1,181,381</u>	<u>\$1,350,220</u>





Kirschenmann cultivates national sustainable agriculture connections

Fred Kirschenmann, Leopold Center Distinguished Fellow, reports that he gave 32 presentations during the last 12 months. Among them were speeches at Drake University, University of Iowa, ISU Extension Master Conservationist continuing education program, and the Cedar Falls Center for Regenerative Society retreat. He offered several national keynote addresses and panel presentations, including appearances at the National Edible Communities conference, the Northland Ministry Partnership conference, the National Sustainable Agriculture Funders meeting, the USDA 2010 Agriculture Outlook Forum, and the Yale Law School Agricultural Policy conference.

Cultivating an Ecological Conscience: Essays from a Farmer Philosopher, his book of essays collected over 30 years, was published by the University of Kentucky Press this spring. “Kirschenmann is right up there with the other agronomic philosophers – Wendell Berry and Wes Jackson. His book is an unfailingly interesting reflection on his own farming experience. It should inspire everyone to start planting and to think deeply about the food we eat,” commented Marion Nestle, author of *Food Politics*. Kirschenmann read several of his essays at a “meet the author” event at the Ames Public Library in May.

Kirschenmann spends half of his time engaged in the work of the Stone Barns Center for Food and Agriculture (where he is president of the board) in Pocantico Hills, New York, an hour north of New York City. He says, “We are demonstrating sustainable agriculture practices for farmers in more urban settings and featuring educational programs for young farmers. More than 200 young farmers from around the country now regularly attend the Stone Barns’ annual young farmer conference and workshops focused on specific farming practices are held throughout the year.”

He helps delineate the Stone Barns’ larger vision for a sustainable agriculture and food system. This year he devoted time to partnership collaborations with faculty at Columbia University in New York City, health care professionals at MIT in Boston and health insurance company representatives, to explore ways that can begin to link the work being done in sustainable agriculture with renewed efforts to explore the connections between agriculture, food and health. Under a renewable Memorandum of Understanding, the Leopold Center and Stone Barns share the cost of Kirschenmann’s salary, while both benefit from his expertise and networking skills. For more about Stone Barns, see www.stonebarnscenter.org

Kirschenmann expends considerable energy on the Agriculture of the Middle (AOTM) program, one of the core issues of the Leopold Center. He notes that the program recently has received a great deal of attention from USDA, and policy makers seem to be receptive to many of the policy recommendations that the National Sustainable Agriculture Coalition (with the help of key personnel in the AOTM policy working group) has put forth. Together, they have managed to incorporate opportunities for AOTM farmers into legislative language. The AOTM team also works with National Farmers Union to implement new market opportunities for midsize farmers. To learn more about this program, see www.agofthemiddle.org

Interim director appointed for Center after search fails

the 2009 nationwide search for a Center director ended without a director being chosen. Lois Wright Morton, an Iowa State University sociology professor, was named to serve as the interim director of the Leopold Center for Sustainable Agriculture. Wright Morton's appointment began July 1, 2010. She replaced Jerry DeWitt, who served since 2005 as Center director and retired after 38 years of service to the university and the state of Iowa.

A rural sociologist, Morton has been a member of the ISU faculty for 11 years. She conducts research in areas such as farmer decision-making; social connections of people and organizations; leadership development; and how people and communities work together to solve shared problems of natural resource management. With an appointment in ISU Agriculture and Natural Resources Extension, her research is integrated into extension programs. She has taught a course on sociology of environment to undergraduate and graduate students.

His advice and counsel continue to be in demand on several boards and research teams related to sustainable agriculture, including Silos and Smokestacks, the Whiterock Conservancy (where he still serves as board chair), the Center for Regenerative Society, and the NC-1036 research team that is overseeing research work on the Agriculture of the Middle. He recently completed a six-year term on the Food Alliance board.

During FY2010, he published two articles in peer-reviewed journals and five chapters in books. He wrote on "Reconsidering Grass" in the *Soil and Water Conservation Society Journal* and on "Alternative Agriculture in an Energy and Resource-depleting Future," in *Renewable Agriculture and Food Systems Journal*. Book chapters he penned appeared in *Soil and Culture*, *Organic Farming: The Ecological System*, *Sustainable Agroecosystem Management*, *Grassland: Quietness and Strength for a New Generation of Agriculture* and *The CAFO Reader*. He also contributed a chapter on "Tending the Land" for the National Geographic volume *Written in Water*.



"Meet the Author" event at
the Ames Public Library





2009 Spencer Award goes to Francis and Susan Thicke, organic dairy operators

Francis and Susan Thicke own and operate a grass-based dairy farm near Fairfield, Iowa. Their farm's organic milk is processed and marketed under the Radiance Dairy brand through local grocery stores and restaurants. The couple's commitment to resource conservation, successful grazing management, and economically profitable dairy production led to their selection as the 2009 winners of the Spencer Award for Sustainable Agriculture.

This dedicated Jefferson County couple has given many community tours of their 236-acre farm, where 60 paddocks are used to feed their herd of 80 Jersey milk cows. The herd is rotationally grazed, moving to a new paddock twice daily. In their on-farm processing plant, they produce skim, low-fat and whole milk, as well as yogurt and cheese, all of which are sold locally.

"We don't really own the land, the land owns us," says Francis Thicke. Using ecological systems as their model, they converted their farm landscape from corn and soybean production to perennial grasses and legumes. The Thickees' farm was included on a "Fairfield Tour of Sustainability" and the organizer reports that "the people on the tour were absolutely fascinated with what they learned. For most of them, sustainability was something that they were hearing about, but did not quite understand. They were able to show how farming is part of the ecology."

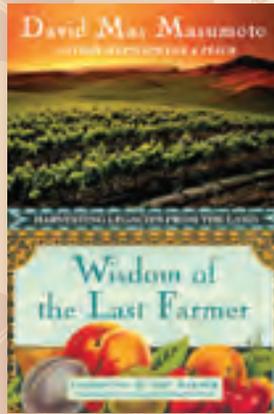
Off the farm, Francis was chosen as a Policy Fellow for the W.K. Kellogg Foundation Food and Society program, and before he returned to farming in 1996, he was the National Program Leader for soil science for the USDA-Extension Service in Washington, D.C. Susan has been active in promoting the arts community in Fairfield.

The Thickees received the Spencer Award for Sustainable Agriculture from Jennifer Steffen, Center advisory board chair, at the December 5 Iowa Organic Conference in Ames.



below: Award presentation: (L to R) Jennifer Steffen, Francis and Susan Thicke, and Jerry DeWitt





California peach farmer glows at 2010 Shivers Lecture

David Mas Masumoto is a third-generation farmer, and his daughter aims to become the fourth generation in his family to nurture the organic peach trees on their farm near Fresno, California. Even though his crops are different than those raised by most Iowa farmers, Masumoto spoke of universal farm truths at the 2010 Shivers Memorial Lecture February 28.

Masumoto, the author of eight books on his farming experiences including the highly-praised *Epitaph for a Peach*, combines the hard realities of farming with a lyrical rendition of the rewards that sustain farmers. Each of his stories carries some baggage from his farm life. As he put it, “The best farms constantly go through transformation. We are trying to grow more than produce.” His motto, inscribed in Japanese characters in the books he autographed for eager readers, is simple but telling: Fall down seven times, get up eight times.

He talked about his peach crops with a rueful but deep-seated affection, recalling the once-popular Elberta variety that “bruised when you stared at it.” This rendered it unsalable in the modern food system where shelf life is a major consideration. He described his frustration at trying to sell his delicate, succulent, perfectly ripened peaches to commercial buyers who are interested in only three things: size, color and cosmetics.

The Elberta Peach Tree Adoption program on his “public” farm has been a way to connect his customers more intimately with the natural rhythm of the growing season. Prospective adoptive peach parents fill out a questionnaire, are asked how they will use the 500 pounds of peaches generated by “their” tree, and ultimately have to decide on the right moment to harvest their fruit.

He read several passages from his newest book, *The Wisdom of the Last Farmer*, which described how he and his family helped his father, who suffered a stroke, return to the farm life he loved. “We farm from memory,” said Masumoto, a message that resonated with many in the audience.

Mas Masumoto’s speech can be heard on the Leopold Center web site at www.leopold.iastate.edu/news/pastevents/masumoto/masumoto.html





above: ISU grad student Laura Christiansen shares details about her research on end of tile bioreactors to remove nitrates



2009 Keeney Lecturer assesses water quality in the Gulf

Eugene Turner, Distinguished Research Master for the Coastal Ecology Institute and oceanographer at Louisiana State University, has been studying the size and composition of the “dead zone” in the Gulf of Mexico since 1985. Turner’s appearance as the 2009 Keeney Distinguished Lecturer reflected the water quality concerns of Dennis Keeney, the Center’s first director, in whose honor the lecture series was created. Turner’s presentation was sponsored by the Leopold Center’s Ecology Initiative.

Turner shared data and impressions about the hypoxia situation and the changes in the seascape over the last 25 years as the Gulf has become one of the world’s largest hypoxic zones. He pointed out to the audience that the nitrogen load in the Mississippi River upstream in north central America as it enters the Gulf is directly proportional to the level of hypoxia in the Gulf of Mexico (which also includes about 30 percent of U.S. fisheries).

As a member of the Louisiana Universities Marine Consortium that takes an annual weeklong Gulf cruise to determine summer measurements of the size of the “dead zone,” Turner reported that the area covered more than 3,000 square miles in 2009. He commented on the effects of hypoxia on a variety of sea creatures ranging from starfish to one-celled diatoms that anchor the bottom of the aquatic food chain.

Turner was quick to point out that nitrogen enrichment problems are not limited to the Gulf. He cited a study showing that 31.8 percent of all U.S. streams are stressed by nitrogen buildup, with phosphorus loading affecting 30 percent of streams.



Photos taken at a
January 13 "culture of conservation"
workshop on how to tell the story



Iowa Learning Farms: Building a Culture of Conservation

the Iowa Learning Farms (ILF) program, in its sixth year, supports farming practices that conserve and improve soil as well as protect water quality while remaining profitable. The program was coordinated by Jerry DeWitt until his retirement at the end of June, and the Leopold Center continues as one of the Iowa Learning Farms' seven partner organizations.

ILF promotes the use of a suite of conservation practices (such as no-tillage, strip-tillage, alternative cropping systems, and structures such as waterways and terraces), by working with Iowa farmers who have implemented one or more of these practices. Guided by the idea that "seeing is believing," ILF collaborates with these farmers to host field days and meetings on their land. Iowa Learning Farms hosted or sponsored 13 field days in 2009 and 10 were scheduled for the summer of 2010. These farmer-to-farmer conversations are critical to making change on the land.

In May 2010, ILF launched the Conservation Station, a mobile learning center that travels the state educating Iowans about the importance of soil and water. The big, blue trailer appears at field days, county fairs, farmers' markets and student educational events all over Iowa. Through demonstrations, pictures, computer animation, interactive displays, video and sound, people of all ages can learn why Iowa's water and soils are precious and how they can help preserve and protect these natural resources. A rainfall simulator in the rear of the trailer demonstrates the effects of rainfall on the land, collecting surface water runoff and showing subsurface drainage.

Two new videos were produced this year. "Converting Your Planter for No-till Operation" is a collection of tips, advice and reminders to heed when adjusting the planter for no-till situations. More than 600 copies have been mailed across the United States, and it has had over 1,200 views on YouTube from the United States and 37 countries.

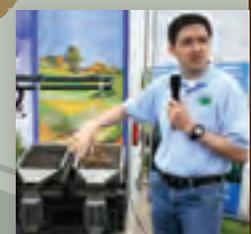


"Troubled Waters," a video launched in the spring, explores the human relationship with rivers and streams. Filmed entirely on Iowa's water bodies, the film highlights several Iowans who share their personal relationships with their local river or stream. "Troubled Waters" received an Iowa Motion Picture Association award for excellence in educational production and also won awards for the script and the original music score.

The ILF continues to partner with other groups, expanding the scope of its research and outreach. A Conservation Innovation Grant explores residue management and removal. The Performance-based Watershed Management project focuses on establishing watershed groups across the state to set agricultural goals that are environmentally sound and economically practical. A cover crop group formed with Practical Farmers of Iowa (in conjunction with the multistate Green Lands, Blue Waters work) centers on farmers who have successfully incorporated cover crops in their crop rotations. Residue Matters, a campaign targeted in northwest Iowa, encourages farmers to keep as much residue on their land as possible. This campaign brought together representatives from state and federal agencies and agribusinesses to help convey this message.

Iowa Learning Farms partner organizations are the Iowa Department of Agriculture and Land Stewardship, Iowa Department of Natural Resources, Natural Resources Conservation Service, Iowa State University Extension, Conservation Districts of Iowa, Iowa Farm Bureau Federation, and the Leopold Center. Learn more about ILF at www.extension.iastate.edu/ILF/

Matt Helmers



Short takes

a 2009 Girl Scouts of America Journey book, *Sow What*, deals with food systems and includes information from Leopold Center findings on food miles and place-based foods. Rich Pirog served as a research advisor for the book which is used in a Girl Scout awards program.

Jerry DeWitt was honored by ISU's College of Agriculture and Life Sciences with the George Washington Carver Distinguished Service Award in October 2009. The award was established to honor ISU alumni and friends for outstanding achievements in the agricultural, food, environmental, social and life sciences. DeWitt was recognized for his decades of service to Iowans, his roles in establishing the organic agriculture program and the Integrated Pest Management program, as well as his years as ISU Extension's state sustainable agriculture coordinator.

Leopold Center Distinguished Fellow Fred Kirschenmann received the 2010 "Growing Green Thought Leader Award" from the Natural Resources Defense Council and was honored at a banquet in San Francisco in April 2010.

the 2009 Friend of the Farmer Education Award from the Iowa Farmers Union was presented to Jerry DeWitt during the organization's annual state convention in August 2009. In honoring DeWitt, they cited his outstanding contribution of working with farmers to solve problems and move toward a more sustainable agriculture in Iowa.

U.S. Deputy Secretary of Agriculture Kathleen Merrigan spoke on "The Future of American Agriculture" in an appearance orchestrated by the Leopold Center in October 2009. She talked about the new USDA program "Know Your Farmer Know Your Food." Her visit to ISU was the first stop in a national tour of college campuses where she hoped to start a national conversation about food with students. Podcast at www.lectures.iastate.edu/lecture/18656



DeWitt receives Carver Award

Center funds future sustainable ag practitioners

the ISU Graduate Program in Sustainable Agriculture (GPSA) was the first and remains the only graduate program in the United States to offer both MS and PhD degrees in sustainable agriculture. The GPSA funding from the Leopold Center for research assistantships is used to support several student-faculty teams. For more information, see www.sust.ag.iastate.edu/gpsa

The FY2010 recipients of Center funding were:

Rachel Peacher

MS, Department of Natural Resource Ecology and Management
Faculty Advisor: Dick Schultz

Water quality and stream ecosystem health can be significantly degraded when excess sediment is present in surface waters. Studies have shown that stream banks can account for the majority of suspended sediment in streams in the Midwest. Peacher's research involves using the erosion pin method to determine the effects of stream order, adjacent land use, and season on stream bank erosion rates in the Crooked and Otter Creek watersheds in northeast Missouri. The sites are stratified across four land uses (crop, pasture, riparian forest, forest) and three stream orders. Each land use treatment was replicated three times for each stream order. Erosion pins have been installed at each site to measure bank erosion and deposition rates and are monitored three times a year in fall, spring, and summer. Vegetation surveys of riparian areas and bank faces took place this summer, and work also is being done to determine if watershed area, sinuosity, and stream slope have any effect on stream bank erosion.

Maria Verburg

MS, Department of Agronomy
Faculty Advisor: Mary Wiedenhoef

Verburg assisted in preparing two grant proposals related to grazing issues, both of which were funded. She also initiated a research project to create a calendar of the nutritional quality of restored grasslands. Three different restored native grassland areas – reconstructed prairie, restored oak savanna, and reconstructed warm-season grassland – will be sampled throughout the growing season from April to December. In order to reduce environmental variability, all three grassland pastures will be located within a three-mile radius on land owned by the Whiterock Conservancy in Coon Rapids, Iowa. Total available forage from each grassland area will be assessed, and the nutritive quality of the forage from the major plant species categories will be analyzed. From these data, a nutritional quality calendar will be created that will enable graziers to make informed decisions on grazing restored grasslands containing native species. The calendar will benefit graziers in the Leopold Center's Grass-Based Livestock Working Group, Practical Farmers of Iowa Grazing Clusters, and the Iowa Prairie Network. (Some of the work is being done as part of grant from the Center's Ecology Initiative to Whiterock Conservancy.)

Jessica Soulis

MS, Department of Sociology
Faculty Advisor: Betty Wells

During this period, Soulis assisted students in Sustainable Agriculture 546 (which received funds from the Center's Marketing and Food Systems Initiative). She worked with class projects, helping them formulate ideas and providing feedback. Upon completion of the class, she worked with Betty Wells to restructure the class and the syllabus based on the assessment of feedback from the 2010 students, coupled with ideas about the 2009 section. They compiled a list of possible student projects in several different areas (Food Access, Nutrition, etc.) for the 2011 syllabus. Throughout the semester and early summer, she also assisted Wells and other collaborators with the preparation of a proposal for the North Central Regional Center for Rural Development Small Grants Program and a pre-proposal for the North Central Region-SARE Research and Education Grant Program. Additionally, Soulis began participating in meetings and conference calls of the Leopold Center's Food Access and Health Working Group. She is working with Iowa dietitian Angie Tagtow on a project that connects federal food assistance funding in Iowa with local food systems.

Rachel Peacher (top)

Kate Dirks (bottom left)

Jessica Soulis (bottom right)



Kate Dirks

MS and MCRP, Department of Community
and Regional Planning
Faculty Advisor: Francis Owusu

As a student pursuing a dual degree in Community and Regional Planning (CRP) as well as Sustainable Agriculture, Dirks assisted Francis Owusu with his research. During the fall semester, she worked on compiling a literature review for a grant proposal for research that he plans to do concerning the effects of changing (Westernizing) lifestyle and eating habits in Ghana. In the spring semester, she gathered information concerning the "local food" movement. This effort yielded information that both supported and criticized the movement and the reasons behind each position. She also spent time in New Zealand in summer 2010 to make some comparisons between food and agriculture there and in the United States.

Center funds cropping systems work by Wallace Chair team

the Leopold Center provides \$20,000 annually to Iowa State's Henry A. Wallace Chair for Sustainable Agriculture, held by ISU agronomy professor Matt Liebman. His current research, outreach and teaching activities focus on ways to use ecological processes to reduce dependency on agrichemicals and fossil fuels. Specific interests of the Wallace Chair programming include: (1) use of perennial crops and prairie species as biofuel feedstocks; (2) weed suppression by diverse crop rotations and rodents and insects that consume weed seeds; (3) nutrient cycling in integrated crop-livestock systems; (4) energetic costs and economic returns associated with simple and diverse rotation systems; and (5) dynamics of native plant communities in filter and buffer strips constructed in and around corn and soybean fields. For more details, see www.wallacechair.iastate.edu

Graduate student funded

In 2009-2010, Leopold Center funds administered by the Wallace Chair were used to support Sarah Hirsh, who is pursuing a MS degree in Sustainable Agriculture and Ecology and Evolutionary Biology, with Liebman serving as her major professor. She began her studies in 2009 and expects to graduate in December 2011. The grant award from the Leopold Center was used to support a stipend, tuition, fees, and benefits for Hirsch. In addition to the financial support Hirsch receives from this grant, the ISU Department of Agronomy is providing \$12,500 to supplement that funding.

Hirsh's research focuses on the vegetative aspects of cropping systems using perennial buffer strips in an experiment conducted at the Neal Smith National Wildlife Refuge near Prairie City, Iowa. The Leopold Center currently funds faculty research efforts at the Refuge as part of the same experiment. Buffer strips can benefit ecosystems by reducing soil erosion and, as some studies indicate, by reducing nitrate, phosphorus and pesticide runoff into streams and rivers. Hirsh's project identifies the species composition and relative abundance of different plants in buffer strips, with special attention to the conservation of native plant species. She also is determining the extent to which weeds within the buffer strips migrate into the crop portion of the field.



2009 field work

In 2009, Hirsh conducted plant surveys to evaluate plant species diversity and prevalence. Her research measured cover by different species of prairie perennials and weeds in 12 experimental watersheds and compared the species diversity in cropped and non-cropped areas. The watershed plots were assigned to four treatments: (1) 90 percent crop, 10 percent prairie buffer strip at the bottom, (2) 90 percent crop, 10 percent prairie buffer strips throughout, (3) 90 percent crop, 10 percent prairie buffer strips throughout, (4) 100 percent crop. Future work on this project will test whether species diversity, plant composition and plant cover change in the years following establishment by comparing data from 2008 through 2010.





Leopold Center continues valuable partnership with Practical Farmers of Iowa



support from the Leopold Center has proved vital to sustaining the Practical Farmers of Iowa Cooperators' Program, which allows a curious and innovative group of Iowa farmers to investigate their most pressing on-farm research questions. The 125 farmers who attended the February 2010 PFI Cooperators' meeting reported on the past year's projects. Among them were:

- A five-year study to help discern the effect of cover crops on crop yield and soil quality
- An experiment to quantify the ecological resiliency of different farming systems by measuring the rate of water infiltration in the various farming systems
- A comparison of soybean varieties for their potential resistance to aphids
- A test to assess heritage breeds of chickens.

At the same meeting, PFI farmers set their new priorities and projects. PFI farmers identified these research topics for 2010:

1. Can I be profitable when adding cover crops/living mulch/rotations to my systems?
2. How much carbon is sequestered with the addition of a cover crop in a rotation?
3. What are effective pest control methods in a chemical-free fruit and vegetable system?
4. How do we improve pastures to extend the grazing season and reduce hay feeding?
5. How is the nutritional content of poultry affected by breed, feed and pasture?
6. And for non-farmers who make up a quarter of the PFI membership: What percentage of my food budget am I spending on local food purchases, and how can I increase that percentage?

PFI members pursued answers to those questions by conducting 100 on-farm research and demonstration projects. Seventy-two individuals were involved in these projects with some farmers conducting as many as four projects on their farms. Research topics in 2010 included:

- Poultry nutritional composition testing
- Breeding corn for sustainable agriculture
- Farming system effects on water infiltration and soil quality
- Cover crop effect on following cash crop
- Seeding cover crops using high-clearance equipment and planes
- Testing new cover crop species and their effects on weeds
- How to control Canada thistle with cover crops
- Cover crop effect on soil quality and water infiltration
- Grazing cover crops
- Comparison of aphid-resistant and susceptible soybean varieties
- Energy produced and consumed in different cropping systems
- Designing on-farm research tools for graziers
- Documenting local food consumption
- Measuring production from season extension
- Flea beetle control in eggplants

Leopold Center support fuels PFI's extensive slate of field days each year. The 2009 field days had something for everyone: cover crops, non-GMO corn seed, cucumber beetle control, herding dogs, poultry breeds, and more. More than 2,500 people (less than half of them PFI members) attended the 32 field days. For those who could not attend, PFI staff began a blog to showcase the highlights of the field day season.

PFI has amassed nearly 25 years of results from on-farm research and demonstration projects. In 2009, PFI devoted major resources to reorganizing those research reports and moving them to more prominent locations at www.practicalfarmers.org

Leopold Center support also makes possible the PFI annual conference. Despite inclement weather, 353 people attended the 2010 conference that celebrated PFI's Jubilee 25th Anniversary. The keynote addresses, by young PFI members Jan Libbey, Andy Johnson, James Frantzen and Kayla Koether, focused on Iowa agriculture for the next 25 years.



Center funds wide range of ISU organic agriculture activities

the **Leopold Center** has been pleased to support Iowa State University's program of organic research, extension and education from its beginning in 1997. The organic agriculture program is under the supervision of Kathleen Delate of the ISU horticulture and agronomy departments and Cynthia Cambardella of the USDA National Laboratory for Agriculture and the Environment with assistance from graduate students. For more information, see <http://extension.agron.iastate.edu/organicag>

As part of their outreach and extension responsibilities, Delate and her colleagues shared research results from this organic initiative project to 1,482 participants through 34 research and extension presentations in Iowa and other states/countries.

Here are results from three of the year's major research projects:

Long-Term Agroecological Research site

Overall performance in the LTAR experiment in 2009 was excellent, despite challenging weather conditions. Organic corn yields in the three-year rotation (Corn-Soybean-Oat/Alfalfa) were statistically equivalent to conventional corn yields in the corn-soybean (C-S) rotation (198 vs. 211 bushels per acre). Organic three- and four-year rotation soybean yields (averaging 62 bu/acre) also were similar to conventional soybean yields. However, there were significantly lower yields in the organic soybean-wheat (S-W) rotation (48 bu/acre). Organic small grain yields were adversely affected by extended periods of wet weather in 2009, and in the case of wheat, a poor initial stand, lack of snow cover, and the wet spring created conditions that led to yields of 9 bu/acre and 1.34 tons/acre of straw. Oats yielded 73 bu/acre. Alfalfa yields were excellent, averaging 3.9 tons/acre. Because of continued problems of poor wheat crops and excessive weeds in the S-W rotation, this rotation was changed in 2010 to include corn in the rotation. Insect pest populations were low in 2009, with no observed damage from corn borer populations, low bean leaf beetle and soybean cyst nematode numbers, with stained soybeans averaging less than 1 percent. Grain quality was equivalent between conventional and organic crops, with corn and soybean protein levels at 8.4 and 35 percent, respectively; corn and soybean carbohydrate levels at 61 and 24 percent; and oil levels at 4 and 19 percent. In 2010, this long-term research project began its thirteenth year of operation.



Kathleen Delate,
organic program coordinator

Management of soybean staining disease and soybean aphid in organic soybeans

This research project found that bean leaf beetles, which serve as vectors for the seed-staining bean pod mottle virus (BPMV) and provide sites for other seed-staining fungi such as purple stain, colonized soybean plants in low numbers in 2009. The soybean aphid was specifically monitored in this trial because the new Blue River 29AR9 soybean aphid-resistant soybean variety was planted for the first time at the Neely-Kinyon Farm. Organic treatments of PyGanic® (McLaughlin Gormley King, Minneapolis, MN), Neemix® (Certis USA, LLC, Columbia, MD), karanja oil plus neem, and Micro AF (TerraMax, Inc., Ham Lake, MN) were compared to a control. Yields of the aphid-resistant soybean variety were excellent in 2009 with an average of 56 bu/acre, showing no significant differences among treatments. Peak aphid populations averaged 10 aphids per eight sweeps across all treatments, which was 2.8 percent of 2008 levels. Peak bean leaf beetle populations averaged three beetles per eight sweeps across all treatments, 10 percent of 2008 levels. There were no significant differences between organic treatments and the control. Peak beneficial insect populations averaged six insects per eight sweeps, with no significant differences among treatments, signifying minimal effect from the organic insecticides on natural enemies. Beneficial arthropods found in 2009 included minute pirate bugs, spiders, lady beetles, lacewings, damsel bugs, parasitic wasps, and assassin bugs. Grain quality was excellent, with an average protein content of 36 percent, 18 percent oil, and 23 percent carbohydrates.

Organic treatments for soybean fertility and disease management

This trial examined organic-compliant treatments to improve plant nutritional status and evaluated a new organic, anti-fungal disease product. Treatments were Twin N® (Mapleton Agri-Biotec Pty. Ltd., Mapleton, QLD, Australia), Soy Soap® (Biobased Ag, East Bend, NC), and Regalia® (Marrone Bio Innovations, Inc., Davis, CA). Blue River 29AR9 soybean aphid-resistant soybeans in this trial produced excellent yields, averaging 55 bu/acre over all treatments. Differences in yields and pests (insects and diseases) between organic treatments and the control were not significant. Peak aphid populations averaged 16 aphids per eight sweeps. Peak bean leaf beetle populations averaged three beetles per eight sweeps. Beneficial insects were similar between treatments and the control, signifying a lack of any negative effect from the organic treatments. Disease pressure was extremely low in 2009, with no sign of soybean rust. These trials were to be repeated in 2010.





Impact of organic practices on soil and water quality

An important component of the LTAR experiment has been an examination of soil quality in each crop rotation. Soil quality has been consistently higher in the LTAR organic rotations relative to the conventionally managed corn-soybean rotation over the last 12 years. In the fall of 2009, the organic soils had more soil organic carbon (SOC), total N, microbial biomass C (MBC), labile organic N; higher P, K, Mg and Ca concentrations; and lower soil acidity than conventional soils. Soil organic C was lower in the organic soybean-winter wheat rotation than the other organic rotations, reflecting the lack of carbon-rich inputs from corn. However, macroaggregate stability was higher in the soybean-winter wheat system in four out of five years, likely because of the dense, fibrous rooting system of the small grain. The three-year organic rotation had more inorganic P and K than the four-year organic rotation, reflecting the greater manure application intensity (two of three years) in the three-year rotation. Soil quality enhancement was particularly evident for labile soil N pools, which are critical for maintenance of N fertility in organic systems, and for basic cation concentrations, which control nutrient availability through the relationship with cation exchange capacity (CEC).

While water quality measurements have not occurred to date in any LCSEA-supported organic agriculture projects, the USDA has recently funded a long-term study of water quality in organic vs. conventional systems in new plots at the ISU Agronomy Farm and at Shriver's on-farm site in Jefferson. The scientific literature on water quality and quantity in organic systems is very limited, but mechanisms underlying improved environmental conditions on organic farms have included improved capacity for greater water and soil nutrient retention due to enhanced soil organic matter content from more diverse crop sequences and application of organic-based amendments, including cover crops and manure. Work is anticipated to begin in fall 2010 with USDA-ARS NLAE to establish a tiled system and connect data-loggers to monitor water flow, nutrients and sediments from each plot. Based on the premise that there is greater soil quality in organic plots, the hypothesis underlying this new research is that more water will be retained in the organic system and available to crops, with fewer nitrates leached into groundwater.



Research programs and locations

Among the research projects supported by the Leopold Center during FY2010:

At Greenfield, Neely-Kinyon Farm

- Comparison of organic and conventional crops, Long-Term Agroecological Research (LTAR) site
- Management of soybean staining disease and soybean aphid in organic soybeans
- Organic treatments for soybean fertility and disease management in organic soybeans
- Disease management of organic grapes
- Insect pest management in organic sweet corn

At Boone, ISU Agronomy Farm

- Organic no-till of grain crops

At Crawfordsville, ISU Southeast Research Farm

- Organic corn trial

At Jefferson, Shriver Farm

- On-farm organic corn fertilization trial

At Adel, Wills Family Orchard

- On-farm organic apple pest management trial

At Madrid, Snus Hill Vineyard

- On-farm organic weed management trial



Sustainable Agricultural Land Tenure work links legal, environmental studies

the Drake University Agricultural Law Center used funding from the Leopold Center to address a variety of issues and opportunities related to its Sustainable Agricultural Land Tenure (SALT) project. The SALT project is guided by Neil Hamilton, Drake University Agricultural Law Center director and former Leopold Center board member.

Hamilton notes that two key factors helped shape the project this year. First, the continuing evolution and recognition of the issue increased the range of opportunities to engage people in discussions about the relation of land tenure to sustainability and stewardship. Notable examples of the link between tenancy and key policy goals are the connections between beginning farmers and stronger local food systems, and the relation of tenancy to farmer-landowner access to emerging carbon markets. In addition, both the USDA and the United Nations Food and Agriculture Organization (FAO) have taken new interest in the issue of land tenure and its impact on the future of food production. Second, the election of President Obama and the appointment of Iowa's Tom Vilsack as U.S. Secretary of Agriculture helped bring new focus to the issues shaping the future structure of agriculture and its performance measured in terms of sustainability. The historic relationship between the Secretary and Drake University opened new opportunities for work on sustainability and land tenure for officials at senior levels in the USDA, especially in connection with agriculture's relation to climate change and efforts to promote rural economic revitalization.

Staff attorney chosen

Ed Cox was hired to fill the staff attorney position in March 2010. He received his J.D. from Drake University Law School in 2009 with a Certificate in Food and Agricultural Law. Cox is researching components of the SALT project focused on state law and farm leasing. Among his activities:

Legal journal articles "Sustainability on Leased Farmland: The Need for Stability and Confidence in the Landlord-Tenant Relationship and the Value of a Creative Lease-Based Solution," was to be published in the fall 2010 edition of the *Drake Journal of Agricultural Law*. This article, the first of a two-part series, examines the growing importance of ensuring sustainability on leased farmland and the value of working within the landlord-tenant relationship to develop creative lease agreements that improve sustainability. The second article will focus on the practical application of creative lease provisions related to sustainability.

Leasing Form Inventory and Analysis Leasing form provisions from academic, legal and government institutions have been collected and analyzed. The provisions have been examined in relation to their benefit or detriment on tenure stability and stewardship, their interaction with relevant laws, and their interaction with other lease provisions.

Tenancy and conservation law inventory and analysis Tenancy laws from Iowa and other Midwestern states have been analyzed in relation to their effects on sustainability. The laws examined range from statutory requirements for notice of lease termination to soil loss limit regulations to common law rights in crop residue.

Interactive website Information and analysis are being incorporated into an interactive website which will be made available to the public in fall 2010. The site will allow landowners and other interested parties access to information, and also a way to explore the information in a comprehensive manner, based on their specific circumstances and priorities. This method will address relevant laws, contain possible lease provisions, and bring other matters that deserve consideration to the attention of users. Materials prepared for the site will form the basis for a new sustainable farm leasing guide.

Drake Forum on “America’s New Farmers: Policy Innovations and Opportunities”

On March 4 and 5, the Agricultural Law Center hosted the Drake Forum on “America’s New Farmers: Policy Innovations and Opportunities” in Washington D.C. More than 200 people from 40 states attended the forum, and heard from 55 speakers, moderators and policy reporters. On the opening day, Secretary of Agriculture Vilsack gave a kick-off speech and Senator Tom Harkin (D-IA) delivered the luncheon keynote. Planning for the forum took 16 months and the Center raised more than \$100,000 in external funds from USDA Risk Management Agency, Farm Credit, the Leopold Center and others to sponsor the event. More than 50 farmers and others received scholarships and travel support to attend and more than 40 national organizations served as co-sponsors. Those attending included: 15 senior USDA officials, representatives from 10 Congressional offices and a dozen universities, and farm policy advocates and young farmers from across the nation. Ten percent of the attendees were minorities and more than half were women. The goal in organizing the forum was to use the “power to convene” to create a national event to generate a more robust national discussion of new farmer policy issues. The organizers tapped a rich vein of bright, energetic young people who want to be part of America’s food system. Since the forum, several agency and foundation officials have contacted the Center to discuss new farmer issues and have volunteered support for future work. For more about the forum, see www.law.drake.edu/centers/agLaw/?pageID=beginningFarmers

Support for interns

Summer service learning stipends were given to six Drake law student interns as part of the SALT project. In 2009, Keith Duffy worked with the Ag Law Center to inventory farm leases and other carbon-contracting related issues; Ross Baxter worked with the Leopold Center on several projects; Amanda Atherton worked with the Iowa Natural Heritage Foundation on a project designed to promote sustainable agricultural practices on lands owned and managed by the INHF; and Judd Jensen worked with the Iowa Environmental Council on a series of Iowa environmental issues. In 2010 Judd Jensen worked with the Leopold Center on the Iowa Local Food and Farm Plan and Tim Reilly worked with the ISU Beginning Farmer Center on new farmer and land access issues.

Ed Cox, staff attorney





Midwest Grape and Wine Institute aids Iowa wine industry with Leopold support

Iowa's wine industry has grown rapidly over the last decade. In 2000 there were 13 wineries, five commercial vineyards and 30 acres planted with grapes. By June 2010 there were 71 wineries and more than 400 commercial vineyards in the state covering 1,200+ acres. Long-term growth and sustainability of Iowa's wine industry depends on a sustainable and profitable grape industry.

The Leopold Center provided \$12,500 to support work by Murli Dharmadhikari, ISU Extension enologist and Director of the Midwest Grape and Wine Industry Institute. He supervises the wine research and service laboratory and does outreach and training for the ISU Extension enology efforts.

Among the key projects conducted this year by the Midwest Grape and Wine Institute:

The Vintner's Quality Alliance (VQA) program concluded its second year. The institute collaborated with VQA members to establish chemical and sensory standards by which wines would be analyzed. A group of volunteer VQA members were trained in sensory analysis, testing 123 samples submitted by the 30 VQA wineries. Individual reports are being disseminated and an overall summary of the quality of the wines tested will be given to the VQA members. These findings will be used to inform future research and outreach needs.

Test wine was made from the grapes grown at the ISU Horticulture Research Farm near Ames. Experiments were conducted using promalic yeast to reduce acidity in high-acid wines in order to learn how to better produce balanced wines. Findings from this trial were presented at the 2010 American Association of Enologists and Viticulturists Cold Hardy Varietal Conference in Seattle.

A pre-proposal planning grant was received in collaboration with researchers at Cornell University, University of Wisconsin-Madison, University of South Dakota, University of Vermont and University of Minnesota. The planning grant was intended to help prepare a proposal for the Specialty Crop Research Initiative. A regional wine and grape producer association survey compiled basic information on acreage and membership characteristics, as well as the top three priorities (or issues needing more information) for research and outreach in viticulture, winemaking, and business organization/marketing. The survey results are to be used as a starting point for workshop discussions conducted in Vermont, Minnesota and Iowa.

Workshops and courses were conducted on these topics:

- Experimental Course on Sensory Analysis of Wine
- Introduction to Grapes and Wine
- Basic Wine Making Workshop
- Distillation Workshop
- SO₂-lab workshop on how to measure and manipulate SO₂ levels in wine





Drainage monitoring project measures water quality on ISU research farm

“Drainage Water Quality Impacts of Agricultural Management Practices,”

a project investigating the links between water quality and livestock production continued this year at ISU’s Northeast Research and Demonstration Farm near Nashua. The Leopold Center provided \$10,500 to assist three ISU professors working on the project. The principal investigators are Matt Helmers and Ramesh Kanwar in the Department of Agricultural and Biosystems Engineering, and Antonio Mallarino in the Department of Agronomy.

The investigators want to evaluate the impacts of liquid swine manure application, tillage, crop rotation, and cover crops on dissolved nutrient loss in subsurface drainage. Their research seeks to answer these questions:

- Can dissolved nutrient losses be decreased when including a cover crop after both corn and soybeans within a corn/soybean rotation?
- How are dissolved nutrient losses influenced by liquid swine manure application before planting both corn and soybeans?
- How does tillage or lack of tillage within corn/soybean systems affect dissolved nutrient loss?
- How does dissolved nutrient loss from a continuous corn system compare to a corn/soybean system?
- Does corn residue removal have an effect on dissolved nutrient loss in a continuous corn system?

During fall 2009 and spring 2010, fertilizer and manure were applied to appropriate plots and manure nutrient analysis was performed to ensure that target application rates were being achieved. Cover crop biomass was collected prior to killing and before corn and soybean planting occurred, was quantified, and is being analyzed for total nitrogen uptake. Soil samples from 0-6, 6-12, 12-24, and 24-36 inches were collected in fall 2009 and are being analyzed for total carbon and under routine soil-test methods.

During non-freezing conditions, tile drainage water samples were collected (on at least a weekly basis) for nitrate and dissolved-reactive P analysis during 2009 and 2010. Preliminary analysis of the results of these treatments implemented in 2007 has begun. Three-year average $\text{NO}_3\text{-N}$ concentrations in tile water from plots under continuous corn receiving swine manure every year were the highest in comparison with other treatments/systems. The corn/soybean system that received fall swine manure prior to both corn and soybean crops had the highest $\text{NO}_3\text{-N}$ concentrations in tile water when compared with other systems in a corn/soybean rotation. During these three years, which were not ideal for cover crop growth due to cold wet springs, nitrate concentrations in tile water from the corn/soybean system without a cover crop were similar to or slightly higher than nitrate concentrations from the corn/soybean system with a cover crop. However, these two treatments need to be evaluated during a variety of weather patterns over the next few years.





Ecology Initiative

The Ecology Initiative focuses on a suite of projects and activities to investigate the effects of agricultural practices on water and soil. The initiative activities were led by Jeri Neal, with assistance from Phil Damery, an ISU sustainable agriculture graduate student.

The initiative focused on helping investigators, internal stakeholders (scientists and students from different disciplines) as well as external stakeholders, such as agencies, producers and NGOs, to explore critical ecological research questions. Emphasis was placed on improving how the Leopold Center tells its research story, via popular web-based video features, improved engagement with students, and research team work that is receiving expanded coverage as well as successfully capturing federal funds to further build on the Leopold Center investment.

Events

The Midwest Cover Crops Council (MCCC) annual meeting

This working group, affiliated with the Green Lands, Blue Waters consortium, includes participants from several Midwestern states and Canada. In March the Ecology Initiative, with Practical Farmers of Iowa and the USDA National Laboratory for Agriculture and the Environment, organized the MCCC annual meeting in Ames. Farmers and researchers shared their experiences and scientific findings regarding cover crops. More than 120 people from 13 states and provinces attended. Nearly half were farmers, including some who had never used cover crops in their operation.

Ames Reads Leopold

The Ecology Initiative worked with Erv Klaus, ISU professor emeritus in Natural Resource Ecology and Management, on the third annual Ames Reads Leopold event at the Ames Public Library. Community members, students and faculty read excerpts from Aldo Leopold's *A Sand County Almanac*. This was an opportunity for community members to reacquaint themselves with Leopold's ecological thinking and its local implications.

Energy and biomass field tours

As the Center's long-term research work matures, the field plots increasingly serve as an 'on-the-ground' education/outreach resource for the ISU College of Agriculture and Life Sciences and Leopold ecology stakeholders. Two events for out-of-state partners were held: one with members of a new biomass initiative in Wisconsin and another with a group of Michigan

researchers. Participants from Minnesota also were present, and the resulting networking has increased collaborative efforts to better coordinate work across state lines.

Working groups and research teams

The Perennializers

This working group offers "science-based trials of row crops integrated with prairies." It began with a planning grant from the U.S. Forest Service and the Leopold Center to establish research in Jasper County at the Neal Smith National Wildlife Refuge. The team is assessing environmental performance and social acceptance of strategically placed perennial strips in croplands. The research is conducted in 14 small sub-watersheds managed as restored prairie and for row crop production. Native grasses have been planted in plots representing 10 or 20 percent of the total drainage area in each watershed and placed at the bottom or midway up the slope. Immediate goals include: (1) quantifying the effects on sediment and nutrient loss when marginal lands are converted from perennial cover (such as acres enrolled in the Conservation Reserve Program) to row crops, and (2) assessing the environmental benefits from the strategic incorporation of perennial vegetation in farming systems.





Landscape biomass
Todd and Lisa Uthe farm

Researchers are collecting data on water quality, including runoff volume during rainfall events, quality and depth of groundwater, and the amount of sediment, nitrogen and phosphorous leaving each watershed. They also are measuring biodiversity changes for bird and insect populations, plant species and composition in the prairie strips and reconstructed prairie, and insect dynamics across different watersheds.

Work to date shows that incorporation of a strategic, but disproportionately small amount of perennial vegetation within row crop-dominated landscapes will minimize environmental impacts of agricultural production while enhancing ecosystem services and overall agroecosystem sustainability. As the project matures, plant transpiration, soil respiration and total below-ground carbon will be determined. These measures will help determine how perennials affect soil carbon storage, nutrient uptake and water movement in the watersheds.

Mid-American Agroforestry Working Group (MAAWG)

Agroforestry intentionally combines agriculture and forestry to create integrated and sustainable land-use systems. Agroforestry takes advantage of the interactive benefits from combining trees and shrubs with crops and/or livestock.

In November, a group of more than 20 Midwest agroforestry stakeholders from eight states convened at the Iowa Arboretum near Luther to consider the formation of a

working group. The organization will advance the science, practice and adoption of agroforestry by landowners and natural resource managers in the U.S. Midwest region. States showing initial interest were Arkansas, Illinois, Indiana, Iowa, Kansas, Louisiana, Michigan, Minnesota, Missouri, North Dakota, Nebraska, Oklahoma, South Dakota, Texas and Wisconsin.

Goals of the MAAWG are to:

- Identify the core issues (gaps/barriers/conflicts/opportunities) for advancing adoption of agroforestry as a cornerstone of productive land use in the Midwest,
- Initiate and coordinate actions to address and resolve the core issues, and
- Communicate effectively with key audiences about the working group's purpose, goals, core issues, actions and findings.

Core group members attended a May 25-26 workshop in Washington, D.C. that explored the potential to integrate agroforestry across agencies and programs. Specific barriers to moving agroforestry policy issues forward were identified. The group is coordinated by Leopold Center staff members Jeri Neal and Malcolm Robertson, along with Michele Schoenberger, research project leader at the USDA National Agroforestry Center at the University of Nebraska-Lincoln.

Landscape Biomass

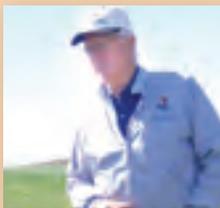
An interdisciplinary team of researchers is collaborating to develop, refine and implement a portfolio of sustainable bioenergy feedstock production systems that contribute significantly to reducing dependence on foreign oil; have net positive social, environmental and rural economic impacts; and are compatible with existing agricultural systems. They are developing several alternative landscape-scale biomass cropping systems and comparing them to a conventional continuous corn system. This long-term research project is being conducted at the Uthe Farm in central Iowa.

Patch-burn Grazing

The group is exploring the restoration of native grasslands and associated biodiversity within a working landscape in southwestern Iowa. The goal is a system based on grazing and recreational land use that is ecologically and economically viable, as well as socially acceptable. The Center is providing funds for innovative software that improves the team's ability to analyze the qualitative engagement of stakeholders and the community in the concepts behind organizing for successful regional patch-burn grazing cooperatives.



at right: left to right, K. Tobin, J. Singer, E. Hafner
of the Iowa Cover Crops Working Group
below: living mulch



Ecology Special Projects

'On-the-Ground with the Leopold Center' video series

Leopold Center ecology and communications staff created short video summaries for current projects. The two- to three-minute videos were shot at research sites around the state and feature researchers explaining their work and how it relates to sustainability. The videos appear on the Leopold Center website, www.leopold.iastate.edu/research/eco_files/ground.html.

Land-Water-Human System of Rural Iowa

Thanos Papanicolaou, a University of Iowa hydroscience engineer, used modeling programs to develop new grassed waterway recommendations for parts of southern Iowa. Lee Burras, an ISU agronomy professor, now will evaluate whether a general cropping intensity-stream quality threshold exists. He will determine whether conservation practices like grassed waterways genuinely affect the water quality in “second order” streams, such as the streams into which the smallest streams flow.

CO₂ Emissions, Land Use, and Soil Organic Carbon

The National Aeronautics and Space Administration (NASA) recently awarded a \$650,000 grant that includes funding for education and outreach by the Ecology Initiative. University of Iowa researchers, including Thanos Papanicolaou, are leading this Experimental Program to Stimulate Competitive Research (EPSCoR) grant. The project will build research capacity within the state and region to quantify links between CO₂ emissions, land-use changes,

and soil organic carbon while establishing a program for carbon cycle studies in intense agricultural systems.

First Steps toward New Tools and Policies to Reduce Nitrogen Pollution and Greenhouse Gas (GHG) Emissions

The Ecology Initiative has developed three videos about its research on soil health, soil function, and water quality and greenhouse gas impacts of conventional and low-external-input cropping systems for an Organic Farming Research (OFR) Association grant to the Henry A. Wallace Chair at ISU. The research includes yield comparisons of diversified cropping systems receiving only small quantities of agrichemicals to produce competitive yields (with conventionally managed, less diverse systems); suppressed weed biomass and weed seed densities; improved soil quality; and reduced net GHG emissions over the life of a rotation.

Iowa Cow Herds and Energy Use

Denise Schwab, ISU Extension beef specialist, headed a special project on the economic cost of energy use in Iowa cow herds. Research indicated that cow-calf producers are moderately concerned about the cost of energy in their beef operations. Major concerns were costs related to crude oil, including fuel, fertilizer, and to a lesser extent, electricity. Their average energy cost per cow was \$26 or only about 5 percent of the total cost of production.



Iowa Cover Crops Working Group

The Iowa Cover Crops Working Group is the local arm of the Midwest Cover Crops Council. In addition to the March regional cover crops meeting, the group held a field day in April, which was covered by Iowa Public Radio. The group is working with the Iowa Learning Farms program to encourage more use of cover crops by farmers. It also is providing Iowa-based information for a multi-state cover crops matrix decision-making tool being developed by the MCCC. The user-friendly tool will allow interested producers to easily determine—based on personal goals, geographic location and the scientific knowledge—the best cover crop choice for their operations.

“Food, Fuel and Quality of Life in Iowa” graduate course

In fall 2009, students and instructors from ISU and the University of Vermont participated in a joint university course, SusAg 620x (Food, Fuel and Quality of Life in Iowa). An in-depth field experience was the basis for a vision of a more resilient and ecologically stable Iowa described in the final class project.

Robert Costanza, an ecological economist, and the University of Vermont students visited Iowa for 10 days. ISU GPSA students were led by Matt Liebman, ISU agronomy professor and Wallace Chair for Sustainable Agriculture; Gretchen Zdorkowski, an agronomy instructor; and Jeri Neal of the Ecology Initiative, which helped sponsor the course.

During the field experience, the students and instructors began to develop four possible scenarios for Iowa in the year 2100. The ISU students met weekly with other experts to share their perspectives on agriculture, energy production and quality of life in Iowa. Among them:

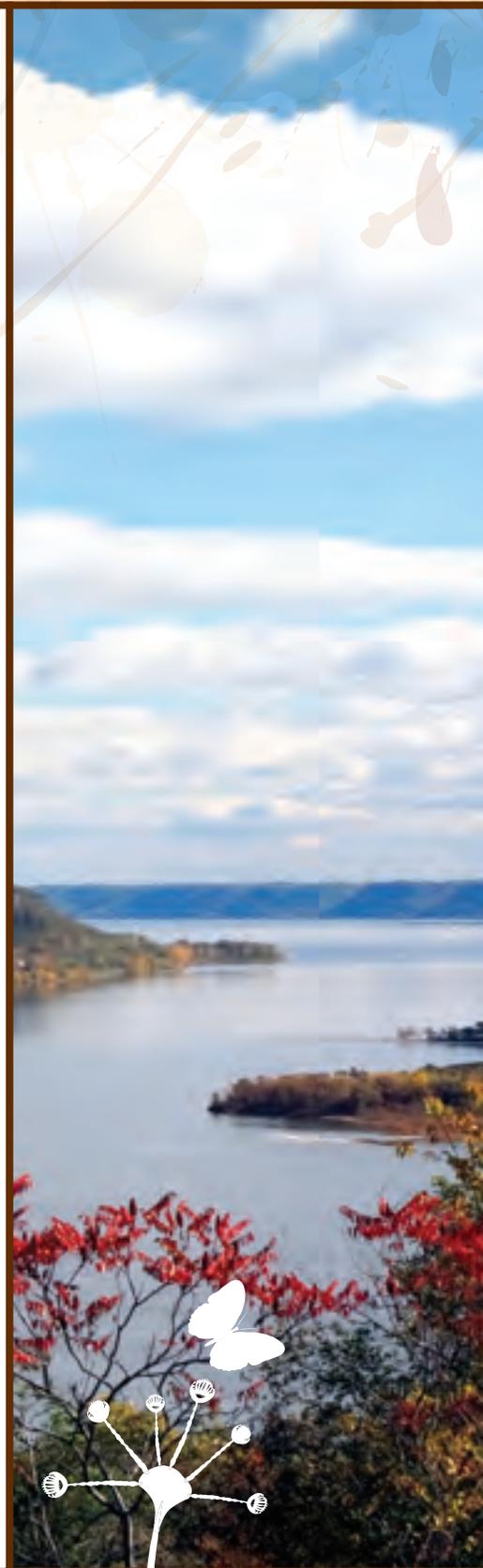
- Sylvia Secchi (environmental economist, Southern Illinois University)
- Rich Pirog (associate director, Leopold Center)
- Richard Levins (emeritus economist, University of Minnesota)
- Rob Anex (agricultural engineer, Iowa State University)
- Lisa Schulte-Moore (ecologist, Iowa State University)
- Craig Cox (policy expert, Environmental Working Group)
- Carolyn Raffensperger (executive director, Science and Environmental Health Network)

The students produced a scholarly paper, “The Future of Agriculture and Society in Iowa: Four Scenarios,” which is currently under review by the *Journal of Ecology and Society*.

Green Lands, Blue Waters (GLBW)

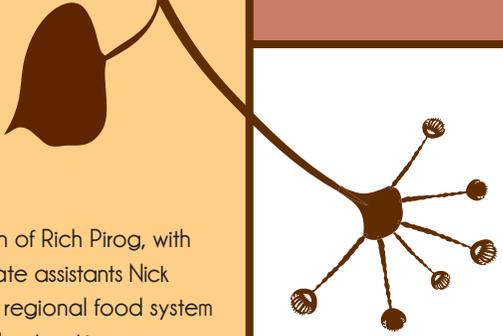
This multi-state working group is a consortium of land-grant universities and agricultural, environmental and rural development non-profit organizations throughout the Mississippi River watershed (www.greenlandsbluewaters.org). The Ecology Initiative supported the GLBW work through an ongoing special agriculture appropriation consisting of federal funding for hypoxia water quality-related work and obtained with the assistance of Senator Tom Harkin (D-IA) and members of his staff on the U.S. Senate Agriculture Committee.

Among the five GLBW working groups, activities were focused primarily on the perennial breeding working group. GLBW steering group members are engaged in conversations with politicians and business leaders on positive roles of perennials on the landscape. Core team member Jerry Glover of the Land Institute received an AAAS Science and Technology Policy Fellowship that placed him as a Science Research and Development Advisor with USAID (Agency for International Development), working on the President’s Global Hunger and Food Security Initiative. Perennial working group outputs included published articles, as well as acquisition of further research grant funding. Consortium core organizational activities included acquisition of capacity development funding that will leverage existing funding, and revision of the organization’s strategic plan in preparation for director hiring.





Marketing and Food Systems Initiative



The Marketing and Food Systems Initiative operated under the direction of Rich Pirog, with program assistance from Beth Larabee, Malcolm Robertson and graduate assistants Nick McCann and Jonah Brown-Joel. The initiative pursued additional local and regional food system and value chain connections through meetings, social and professional networking, competitive grants funding and information sharing.

Communities of Practice Workshop



Events

The initiative sponsored a variety of activities and projects, including two major public events. The fifth Marketing and Food Systems and Value Chain Partnerships workshop on April 1 attracted more than 200 people to hear presentations by all of the initiative grantees describing their projects.

During its 2010 session, the Iowa legislature passed an amendment requesting that the Leopold Center develop an Iowa Local Food and Farm Plan complete with funding and policy recommendations that will enable Iowa to develop a more robust local food business sector. The plan, to be presented to the lawmakers prior to the beginning of the 2011 session, absorbed much energy within the initiative in spring and summer 2010 as information and opinions were gathered prior to writing the plan. On June 24, a working session was held in Ames for 170 people representing more than 50 different Iowa organizations, agencies, food companies and universities. Two surveys, added listening sessions and focus groups were planned for the remainder of the summer and early fall.

Publications

A number of local food-themed publications were issued by the marketing initiative. Among them were “Growing Local: Iowa local food resource guide,” an FAQ on food regulations for small market growers, and the paper “Is Local Food More Expensive? A Consumer Price Perspective on Local and Non-Local Foods Purchased in Iowa.” Dave Swenson of the ISU economics department prepared economic impact studies of increased local foods production in southeast and southwest Iowa and for six states in the upper Midwest. Pirog coauthored “Defining and Marketing ‘Local’ Foods: Geographical Indications for U.S. Products,” which was published in the *Journal of World Intellectual Property*.

Two life cycle environmental analysis papers with Nathan Pelletier (formerly of Dalhousie University in Canada) as the lead author were slated to appear in *Agricultural Systems* journal. One (available on-line in late April) dealt with the impacts of three beef production strategies in the upper Midwest United States and the other in the fall 2010 assessed “High and Low Profitability Commodity and Deep-Bedded Niche Swine Production Systems in the Upper Midwestern United States.”



Projects and programs

Work was completed on the Good Food Network of Upper Midwest project, comprised of 10 organizations and two consultants in six participating states. Network members agreed that allocating time as strategic thinking partners to discuss a variety of key issues for good food was beneficial. The network has developed a set of best practices for collaboration and priority issues on which to work. Realistically, the future of that collaboration will come in the form of different sets of organizational partners coming together to work on in-state and multi-state projects.

MBA graduate student Jonah Brown-Joel and Frank Montabon, ISU professor of Supply Chain and Information Systems, conducted a survey on sustainability practices of Iowa food companies with continuing analysis of 40 usable responses from Iowa food companies.

A new partnership was formed with ISU Extension Value Added Agriculture to continue operation of the Iowa Market Maker marketing tool for farmers and entrepreneurs. The Marketing Initiative was asked to participate in four different U.S. Department of Agriculture/Agriculture & Food Research Initiative global food security letters of intent. The Leopold Center signed on as a potential collaborator on three of these project proposals.



Value Chain Partnerships project (VCP) completes Phase III

In 2009, its final year with Wallace Center funding, the VCP project was able to document increased business profitability and sales of local foods by farmers or local purchases by institutions, and development and implementation of a plan to continue the work of VCP beyond Wallace Center funding. Business profitability proved to be an unreliable indicator of project success, as input costs and market prices may decrease profitability for even the most efficient companies and producers. Other news from VCP:

- Communities of Practice Resource Guide was completed
- Brochures and posters for all five VCP working groups were updated with new logos
- New tagline—An Iowa Network for Food and Agriculture Working Groups—and position statement for Value Chain Partnerships were created, along with website revision (see www.valuechains.org)
- Social networking website for July 21-22 communities of practice participants developed; resource guide and posters and brochures made available on the site
- Communities of Practice Workshop held July 21-22 and more than 75 people from 17 states attend both days; nearly 100 Iowans participated in the second day activities
- Communities of Practice Workshop for ISU Extension conducted on April 19 with more than 45 participants, including 20 local organizational partners

Leopold Center evaluator Corry Bregendahl reported that her assessments of the first four VCP working groups show that VCP and its partners have become respected leaders statewide. The working groups and local partners collectively have leveraged nearly \$4 million, as well as many hours of in-kind time, to support their efforts. Cumulative meeting attendance in these four working groups is in excess of 650 people, with average attendance for one group growing from 36 in its early years to 86 in 2009.

Impacts of the work have been heartening. From 2006-2008, four local groups involved in the Regional Food Systems Working Group covering 27 counties collectively increased local food sales by nearly \$1 million. These groups also measured substantial increases in the number of producers selling local food to local businesses, the number of local businesses buying and/or selling local food, and the amount of seed money these groups were able to award to local food-based businesses and farmers in their geographic area.

Other benefits are apparent as well. Partners in the working groups report they are spending more of their time on local and regional food work than they did a year ago; their organization is changing organizational policies and guidelines to better support such work; they either initiated or participated in new collaborations or projects as a result



Hatched counties indicate a county belonging to more than one local group



of working group participation and the act of partnering with others has helped them connect their work with public policy change. Positive policy changes include the creation of “buy local” purchasing policies, changes in enforcement of state regulations that formerly limited health facility purchases of local food, creation of a county-based food policy council and local food coordinator and school participation in food systems work.

Pork Niche Market Working Group (PNMWG)

Several PNMWG organizations were willing to put in limited funds to continue PNMWG. The Leopold Center awarded a competitive grant to PNMWG to develop a business plan for continued operation beyond 2010. The Iowa Pork Producers Association will fund three issues of the group’s newsletter and a central Iowa meat marketing study is underway. Organizers hope to expand the niche pork virtual tours.



Regional Food Systems Working Group (RFSWG)

In June RFSWG added five new groups for a total of 14 participating entities (see map). Local food groups now have a presence in more than 70 of Iowa’s 99 counties. A social networking website is used to help promote RFSWG member communications. The Center was awarded a USDA Rural Development Rural Business Enterprise Grant of \$72,000 to support the work of the Regional Food Systems Working Group.

Two local RFSWG groups – Hometown Harvest and Northern Iowa Food and Farm Partnership – received more than \$90,000 each from the Wellmark Foundation. The Wellmark program officer cites participation in RFSWG as the key reason both groups received funding. The Northeast Iowa Food and Fitness project (one of the local RFSWG groups) received \$ 1.2 million in implementation funds from the W.K. Kellogg Foundation.



Fruit and Vegetable Working Group (FVWG)

Two post-harvest information field days in July 2009 attracted 80 people to northeast and central events. A post-harvest handling tool for produce is available at www.valuechains.org/fruitvegetable/postharvest.htm. The group also funded projects to explore cooperatives for handling fruit and vegetable processing marketing and distribution and systems for post-harvest handling of vegetables (what works, when to upgrade, how to make decisions about expansion and improvements).

Small Meat Processors Working Group (SMPWG)

- Two meat processing plants want to use the process improvement software that the group is developing.
- USDA Food Safety and Inspection Service (responsible for meat, poultry and egg inspections in the United States) asked to reprint and freely distribute two SMPWG publications: *Beef and Pork Whole Animal Buying Guide* and *Guide to Designing a Small Red Meat Plant*.



by Marketing Initiative Leader Rich Pirog

Presentations

Iowa

Local Foods Roundtable, Perry; Tri-state Local Foods Conference, Fairfield; Community Food Security Annual Conference and Global Food and Global Health Symposium, Des Moines; Sustainability Coordinator Summit, Iowa City

Outside Iowa

Agile Agriculture Summit, Arkansas; Food Distribution Research Society conference, Boulder, Colorado; Agroparistech, INRA, Paris, France; Re-localizing Our Foodshed, Minneapolis, Minnesota; Foodshed Development workshop, Michigan State University, East Lansing, Michigan; National Good Food Network Webinar on Building Regional Food System Networks; Monterey Bay Aquarium Sustainability Institute, Monterey, California; International Conference on Nutritional Behavior, Minneapolis, Minnesota

- The second edition of the Iowa Meat Processor's Resource Guidebook was printed in April 2010.
- The group is producing a stand-alone, product-costing software program for small meat processors. Beta testing of the software began in late June.
- The group's Iowa work is part of a national eXtension Community of Practice – the Niche Meat Processor Assistance Network (www.nichemeatprocessing.org).
- Members met with Jer's Meat Processing, Waukon, and Spillville Locker, Spillville, in February and March 2010.
- The group also plans to produce a business plan guide for small meat processors similar to 2008 locker plant guide.

Food Access and Health Working Group (FAHWG)

- Funded through a Leopold Center Marketing and Food Systems Initiative grant and is linked to new Iowa Food Policy Council
- Informational brochure prepared and initial teleconferences held in April 2010
- First in-person meeting held May 27 in Des Moines

Media interviews/articles

Iowa

- Iowa Public Radio – growth of local food and economic and environmental impacts, Is local food more expensive? report and six-state economic impact study results
- *Des Moines Register* – local food and USDA Rural Development Value Added program
- *Iowa Farmer Today* – sustainable livestock systems
- *USDA Rural Development* (Iowa) newsletter – article on local food networks and research

Outside Iowa

- *Washington Post* – comment on the Virginia Tech cage-free egg issue
- *Beyond Profit* magazine – article on local food and sustainable development in developing countries
- *New York Times* – nutritional benefits of local foods
- *Worldwatch* magazine – economics of local foods
- *Transportation Topics* – food miles, environmental impacts of food transport
- *St. Louis Post-Dispatch* – local food and scaling up and Wal-Mart selling local food
- *Associated Press* – interview about the six-state economic impact study funded by the Leopold Center
- National Public Radio (New Hampshire) *The Exchange* – How sustainable is local food?
- Successful Farming Radio – Beef production system Life Cycle Analysis study
- *Prairie Journal Star* – economic impacts of increased fruit and vegetable production and other local food issues



Policy Initiative

The Policy Initiative is the smallest of the three initiatives supported by the Leopold Center and is charged with conducting research on local, state, or regional policies that affect the sustainability of natural resources and Iowa agriculture. It also supports policy-related aspects of work being conducted by the other two initiatives, and does not engage in advocacy. Program leader for policy work was Jerry DeWitt with assistance from Mary Adams, outreach and policy coordinator.



Iowa county boards of supervisors survey

With considerable assistance from the Iowa State Association of Counties staff, the Policy Initiative conducted an email survey of the Board of Supervisors of each county in early July 2009. Responses were received from supervisors located in 46 of the state's 99 counties. Jerry DeWitt commented, "These responses from the Supervisors will help the Leopold Center better position our work and programming at the county level to make a difference locally." Information obtained about the supervisors' policy interests and priorities was used in preparing the 2010 Request for Pre-proposals.

Supervisors who are formulating policies for their county's rural and agricultural sectors said they are looking for more information on economic impacts in several areas. More than 50 percent wanted data on the economic impacts of changes in state-mandated health or education policies and practices. Forty-seven percent could use data on the economic impacts of state regional energy production, and 42 percent are looking for information on water quality and quantity related to land use practices.

Local food production yielded some interesting observations from the supervisors taking part in the survey. Ninety-five percent agreed (either strongly, generally or somewhat) that local food production has the potential to benefit their county economically. In the next five years, nearly two-thirds expect to see an increase in local food availability for their county residents, while one-third foresaw no change in local food availability.

Water—whether it's too much or too little—was on the minds of the supervisors. Nearly two-thirds reported having either flooding or drought problems in their county. Among the ways they suggested to address the problems are changes in land use and planning, more careful government coordination, and enhanced upstream flood control. Forty-six percent noted that their counties were seriously affected in the floods of 2008.

Looking for ways to enhance water quality, supervisors were asked what county-level policies across a watershed would help improve water quality in their county or town. Riparian buffer strips were the most common answer. Some supervisors responded that counties did not have much ability to regulate water quality, that state and federal rules took precedence over county efforts. And a few people said that there was no problem in their area.

What is the future for sustainable agriculture practices in Iowa counties? In the next five years, supervisors surveyed expect an increase in sustainable agriculture (39 percent) or no change in use of sustainable ag practices (37 percent). Twenty-four percent think the cost of applying such practices will lead to a decrease in usage.





Jerry DeWitt moderates
panel at Drake Forum



Alternative crop enterprise budgets issued

Crop and livestock enterprise budgets available from the Leopold Center and the Beginning Farmer Center at Iowa State University give farmers a quick overview of what alternative operations might work for their operations. The crop budget sheets are available for download at: www.leopold.iastate.edu/pubs/enterprise.html

Enterprise budgets for sweet corn, sorghum, popcorn, sheep and beekeeping were issued first with several more planned. The budgets were designed to quickly and easily show the level of knowledge needed, level of capital, time to pay off, and other important factors that should be considered when deciding if an enterprise is right for a particular farmer. Resources for further information are provided for each crop. No matter what the crop, farmers need to develop a sound business plan to incorporate the enterprise into their existing operation.

The budgets were prepared by ISU Extension economist Mike Duffy with assistance from Jodi Calvert, ISU economics student. Production of the budgets was supported by the Leopold Center's Policy Initiative.



Collaboration with Drake University Agricultural Law Center

The Sustainable Agricultural Land Tenure Project (SALT)

This two-year partnership with the Drake Agricultural Law Center and other agencies including the USDA continued under the direction of Neil Hamilton at Drake University in Des Moines. A key project initiated in 2009 concerned collecting, reviewing and analyzing farm lease agreements in use in Iowa and neighboring states. Ag Law Center staff completed an inventory of standard farm lease agreements used in Iowa and in other north central region states. The agreements were analyzed to identify the language relating to conservation and land stewardship. In addition, Ag Law Center staff completed a legal review of court rulings and other authorities on the topic of stewardship and farm leasing. They conducted interviews with a variety of individuals involved in farm leasing and related matters, including farmers, farm managers, government officials working with conservation and environmental protection, lawyers, and university researchers. (For more information on the SALT project, see page 20.)

“Who is the next generation of farmers?” asked Neil Hamilton, director of the Drake University Agricultural Law Center. His challenge opened “The Drake Forum: America’s New Farmers: Policy Innovations and Opportunities,” held March 4-5 in Washington, D.C. as one part of the SALT project. The conference attracted an eclectic mix of nearly 200 U.S. Department of Agriculture officials, local community organizers, energized new farmers, rural development specialists, and state government representatives. Participants agreed that access to land and credit poses critical barriers for new and beginning farmers nationwide. The challenge is to make government policies (existing and potential) work for both lenders and landowners.

The Leopold Center was one of the conference sponsors. Jerry DeWitt moderated a lively panel on “Hearing from New Farmers –What Critical Obstacle Do They Face?” The panelists argued that the government needed to invest in farms, not just in farm products (commodities), and reframe the job description to make farming more appealing to young people.

Grass-Based Livestock Working Group makes second-year adjustments

The Grass-Based Livestock Working Group (GBLWG) was formed as a result of a call for cross-initiative projects at the Leopold Center. The group (as part of the Value Chains Partnership) uses a community of practice framework to bring together a wide variety of grass-based livestock producers and practitioners as well as the agency and outreach professionals for whom grazing is an area of interest.

Quarterly meeting attendance remains good, ranging from 25 to 45. The working group attracts grass-based beef producers and a small but consistent contingent of small ruminant producers. In the second year, the GBLWG membership's primary focus has been on production issues (i.e., profitable grazing management and decision-making) and ecology (i.e., grazing, wildlife, and the environment).

A Value Chains Partnership evaluator will survey both practitioners and support members of the group. The survey will gather information regarding knowledge, networking and management, trust and collaboration, most valued aspects of the working group and how the group can better serve its members.



Publications

Lynn Betts was commissioned by a group research and development grantee to document five Iowa case studies on using grazing as a land management and improvement tool. They can be downloaded at www.valuechains.org/livestock/resources.htm#casestudies. The case studies include:

- Bison Broaden Biodiversity at Broken Kettle Grasslands
- Graze Goats to Clean Up Unwanted Plants
- Profitable Pasture Rotations Offer Bird and Wildlife Habitat
- Grazing CRP Land Improves Feed and Habitat
- Grassbanks Offer Offsite Grazing during Pasture Renovation

Education and outreach

A one-day workshop funded by a GBLWG research and development grant was held March 30. Inger Lamb of Iowa Native Lands presented "Grazing Native Plants 2," which covered topics such as goats, bison, and patch-burn grazing, and attracted a diverse audience of practitioners and agency personnel. The working group also sponsored a panel discussion on using grazing to enhance habitat at the Iowa Grasslands Conservation Initiative conference in August, and the working group coordinator, Andy Larson, staffed a GBLWG exhibit at the event. Mae Rose Petrehn represented the Grass-Based Livestock Working Group with a display at the Cornbelt Cow-Calf Conference in February 2010, and distributed GBLWG literature at grazing events in Minnesota, South Dakota, Kansas and Nebraska.

2010 GBLWG research and demonstration projects

Creating a Nutritional Quality of Restored Grasslands Calendar
Mary Wiedenhoeft, Iowa State University Agronomy

South Central Iowa Grazing and Wildlife Project
Joe Sellers, ISU Extension

Northeast Iowa Alternative Forage Production and Fencing Costs Demonstration
Denise Schwab, ISU Extension

Rotational Grazing Brochure and Landowner Workshops
Teresa Opheim, Practical Farmers of Iowa, and Ron Windingstad, Audubon Society





Competitive grant projects, new and renewed, for FY2010

The Leopold Center funds a wide variety of research, education and demonstration projects aimed at increasing the sustainability of Iowa agriculture. The projects are selected after a rigorous competitive process that includes issuing a Request for Pre-proposals (RFP) in June, review and assessment of full proposals submitted in November, and ends with awarding of funds at the end of the year.

Four cross-disciplinary projects (see page 47) operate within the competitive grants program in response to special calls for ideas that span all three initiatives: grass-based livestock production, education for beginning farmers, multifunctional agriculture studies and on-farm energy needs.

Ecology Initiative

The Ecological Systems Research Initiative funded eight pre-proposals received from the Summer 2009 RFP. Thirteen projects received renewals for a second or third year of funding and ten projects were granted no-cost extensions or slated to end.

Ecology Initiative existing grants –
Renewals for second and third years of funding
Total amount awarded – \$224,162
Total number of projects – 13

New Ecology grants – FY2010
Total amount awarded – \$236,300
Total number of projects – eight

Agronomic, ecological and economic comparisons of conventional and low-external-input cropping systems, 3 years, ending

M. Liebman, ISU agronomy; C. Chase, ISU Extension; and M. Wander, University of Illinois, Urbana-Champaign

Building on earlier work, this project aims to (1) measure crop yields, weed growth and weed seed densities in conventional and low-external-input (LEI) cropping systems; (2) assess labor requirements, energy consumption, input costs and net returns for conventional and LEI systems; (3) determine the impacts of soil microbes on the survival of weed seeds in conventional and LEI systems; (4) determine the impacts of conventional and LEI systems on soil organic matter and fertility; and (5) distribute results and insights through an outreach program.

Agronomic, environmental and economic performance of alternative biomass cropping systems, 3 years

L. Schulte-Moore, ISU natural resource ecology and management; K. Moore, ISU agronomy; R. Hall, ISU natural resource ecology and management; A. Hallam, ISU economics; and M. Helmers, ISU agricultural and biosystems engineering

The project investigators are seeking biomass cropping systems that are productive, profitable and mitigate the negative effects of annual crops on soil and water quality.

Investigators are developing and testing several alternative systems that include sweet sorghum/triticale for superior biomass yields; a corn-soybean-triticale/soybean and corn-switchgrass rotation to reduce environmental impacts; and combining triticale with aspen and cottonwood plantings to achieve short-term biomass yields and superior long-term yields. All systems will be compared to conventional continuous corn for 1) energy/fertilizer inputs versus biomass outputs, 2) impacts on soil and water quality and 3) establishment, production, harvest and transport costs.

Assessment of woody biomass as a niche feedstock for biobased products in Iowa, 2 years

J. Tyndall, ISU natural resource ecology and management

This project will examine the wood-based feedstock supply in Iowa, including the availability, scalability and infrastructural requirements needed for woody feedstock to supply fiber for bioenergy fuel and other biobased products. Although cellulose biomass seems to be abundant in Iowa, this project will inform public policy initiatives, as well as public and private investments of woody cellulosic resources.



Corn silage test plot to increase profitability for dairy farmers and reduce winter wind and water erosion, 2 years

D. Lawstuen, dairy science, Northeast Iowa Community College, Calmar, and J. Bentley, Northeast Iowa Dairy Foundation Dairy Center, Calmar

This project is the only independent corn silage test plot in Iowa. The team hopes to increase farmers' profitability by testing corn hybrids for yield traits. An increased amount of corn planted for silage could improve soil conservation.

Crop availability of phosphorus in beef manure, 4 years NEW

A. P. Mallarino, ISU agronomy

This research will investigate how much phosphorus in beef manure is plant-available to be used as a fertilizer for cropping systems in Iowa. Current recommendations are outdated, and information from other states is incomplete. Determining true levels of phosphorus in beef manure as a fertilizer can help avoid application rates that are too high or too low.

Custom grazing in Iowa, 1 year, extended

T. Opheim, Practical Farmers of Iowa, Ames

This project evaluated existing grazing arrangements used in Iowa, will recommend how they could be improved and create educational materials based on the findings. Fifty producers were interviewed. Researchers will analyze data from an ongoing grazing and pasture rent survey done by the Natural Resources Conservation Service. Results will be shared at a series of workshops and field days, along with information on successful models for custom grazing contracts in Iowa. An Iowa Custom Graziers Directory will be prepared.

Defining the grazing season of restored natural grasslands, 2 years NEW

T. Hunt, Whiterock Conservancy, Coon Rapids

This project demonstrates for producers and land managers a two-step process: 1) testing the nutritional quality of on-farm forage in restored

grasslands and 2) adjusting strategic grazing planning to optimize use of grazing as a management tool in restored native grasslands while resting permanent pastures and sustaining pasture/livestock income.

Energy use and nutrient cycling in pig production systems, 2 years, ending

M. Honeyman, ISU Research Farms, and P. Lammers, National Center for Appropriate Technology

This project quantifies energy use in Iowa's pig production systems by using process analysis. All direct and indirect energy inputs in the construction and operation of a pig facility and in the cultivation and processing of feed ingredients will be considered. The results will provide an understanding of energy use and flows of an entire pig production system, for both conventional and alternative options.

Evaluating canola (*Brassica napus*) as an alternative oilseed crop and enhancing winter cover in Iowa, 3 years

M. Wiedenhoef and S. Gailans, ISU agronomy

One of the objectives of this project is to increase the amount of information available to growers about canola as a 'third' crop in Iowa. Investigators also want to gather more data about winter cover crops in Iowa. The team will assess the economical and ecological impacts of alternative cropping systems and different crop rotations. Data will be used to make recommendations to farmers.

Evaluating denitrifying bioreactors for edge-of-field nitrogen management in Iowa's tile-drained landscapes, 2 years

M. Helmers, ISU agricultural and biosystems engineering

The long-term goal of this project is to promote sustainable agriculture by facilitating the adoption of more efficient nitrogen management practices in Iowa and the upper Mississippi River Basin. Investigators will evaluate the performance of denitrifying bioreactors under Iowa field conditions, specifically using a design that allows high nitrate removal.





Forage double-cropping demonstration, 3 years, ending

I. Lamb, Iowa Native Lands; S. Barnhart, ISU agronomy; and M. Honeyman, ISU Research Farms

Research plots of cool-season legume crops (alfalfa and medium red clover) were inter-seeded with warm-season native prairie species to generate management and forage quality evaluation data. The investigators are seeking forage alternatives with improved diversity that will require fewer management inputs while exhibiting high-quality performance.

Grazing compatibility in and for future years, 5 years

C. Nelson, Southern Iowa Forage and Livestock Committee, and J. Klein, Natural Resources Conservation Service, Corning

Research and demonstrations were conducted on wildlife compatibility with grazing and grassland pasture conversion from cool- to warm-season grasses. In-field education is ongoing with high school and college agriculture students to inform them about rotational grazing management and conservation. Grazing curricula targeted to vocational agriculture instructors will be created.

Grazing prairie: Improving species diversity while maintaining cattle and goat productivity and resting home pastures, 3 years

D. Ryan and L. Appelgate, Iowa Heartland Resource Conservation and Development, Ankeny; L. Lown, Natural Resources Specialist, Polk County Conservation Board

The investigators seek to increase species diversity at Chichaqua Bottoms Wildlife Area in Polk County by grazing cattle on a 263-acre reconstructed prairie and browsing goats in three oak savanna areas degraded by invasive species. Calf-weaning weights, body condition scores, and the economic value of winter forage harvested or stockpiled on resting home pastures also will be measured.



Greenhorn Grazing: A modular pasture and animal management curriculum for beginning and transitioning graziers, 3 years

B. Leu, ISU Extension, Fairfield

Greenhorn Grazing is an educational program for beginning and transitioning producers who want to optimize production and achieve the benefits of conservation. The project aims to lower the perceived barriers associated with entry into the grass-based livestock industry, improve the productivity and use of land, help maintain or increase perennial grassland agriculture and encourage life-long learning among graziers.

The impact of biodiversity services in row crop production in annual versus perennial landscapes, 2 years, ending

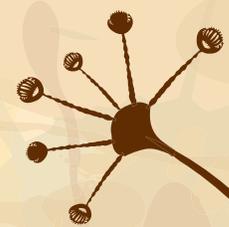
M. O'Neal, ISU entomology, and L. Schulte-Moore, ISU natural resource ecology and management

Investigators are comparing levels of insect biodiversity and insect pest suppression between integrated perennial-annual landscapes and landscapes dominated by corn-soybean production agriculture. This will offer a scientific foundation for enhancing biodiversity within landscapes dominated by annual row crops.

Impacts of conventional and diversified rotation systems on crop yields, profitability, soil functions and environmental quality, 3 years NEW

M. Liebman, ISU agronomy

This project is a continuation of a previously funded grant that compared the agronomic, ecological and economic effects of conventional and low external input cropping systems. It focuses on measurements of nitrate leaching, greenhouse gas emissions from soil, carbon sequestration, and soil organic matter transformations, especially those related to nitrogen availability to crops. For this effort, the soybean and corn plots have been split to allow side-by-side comparisons of genetically engineered and non-genetically engineered hybrids and varieties.





Improving soil quality by conserving insect pathogens, 2 years NEW

A. Gassmann and E. Hodgson, ISU entomology

Naturally occurring fungi that act as insect pathogens live in the soil, but they might be reduced or compromised by conventional farming practices, specifically by different kinds of fungicides. This project will compare the abundance of these below-ground fungi in conventional and organic cropping systems. The project results will be used to better understand the role such insect-pathogenic fungi can play as part of a suite of integrated pest management practices.

Increasing carbon sequestration of working prairie by reducing invasive species in a fire and grazing system, 1 year NEW

R. Harr, ISU natural resource ecology and management

This project is related to previously funded work on patch-burn grazing in southern Iowa. It will look at how the invasion of cool-season grasses affects the carbon sequestration potential of native grasslands, and evaluate and demonstrate the effectiveness of patch-burn grazing as an ecologically sound, low-input means for tall grass prairie restoration.

The landowners' decision: Grazing and fire as management tools on Iowa grasslands and oak savannas, 3 years, ending

L. Wright Morton, ISU sociology

The project seeks to learn more about landowner attitudes, perceptions and knowledge of fire as a management tool for controlling invasive species and enhancing conditions for native plants and animals on recreational and productive agricultural lands. The investigators use survey, research, meetings and innovative qualitative analysis tools to integrate research and indigenous knowledge and explore the potential for a regional identity that includes patch burn grazing as a standard practice for land management.

Land use conversion to perennial vegetation: Quantifying soil water regime and aeration and the implications for enhancing soil resilience to climate change, 3 years

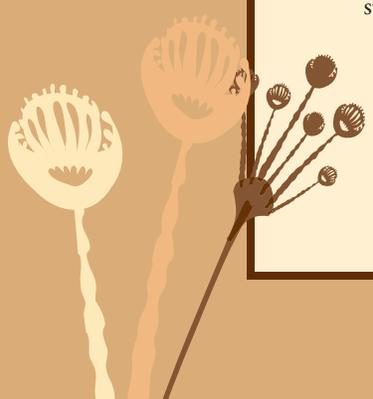
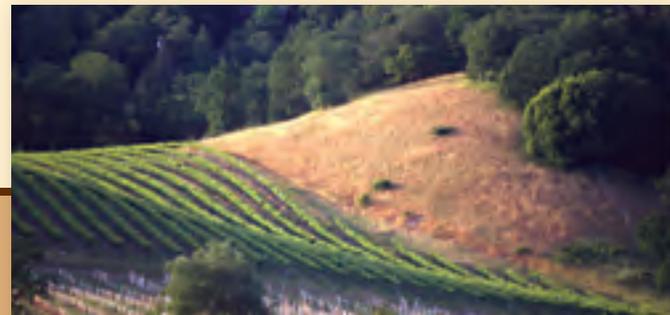
R. Horton, ISU agronomy, and T. Sauer, USDA National Laboratory for Agriculture and the Environment, Ames

This project will characterize the soil water regime, look at the dynamics of the composition of soil atmosphere and examine aeration effects on root activity and decomposition of organic matter. The project expands ongoing ISU research at the Comparison of Biofuel Systems (COBS) site supported by Conoco-Phillips. (The COBS project seeks to identify and develop cropping systems that produce high yields of biofuel feedstocks while protecting soil, water, and air resources. Feedstock production treatments include continuous corn grown for grain and stover, with and without a winter cover crop; a mixture of perennial prairie plants with and without fertilizer addition; and a conventional corn-soybean cash grain system for baseline comparison.)

Optimizing buffer strips for improved ecosystem services, 3 years

M. O'Neal, ISU entomology, and L. Schulte-Moore, ISU natural resource ecology and management

The goal of this project is to form a research base that can guide farmers, landowners and policy makers on the enhancement of ecosystem services derived from agricultural landscapes. Investigators hope to better understand how perennial vegetation can improve conditions for crop production. They plan to compare multiple options for buffer construction and improvement of buffer performance at on-farm sites. The project includes field days at the demonstration site.



Optimizing legume establishment in winter small grains, 3 years, ending

R. Horton, ISU agronomy, and J. Singer, USDA National Laboratory for Agriculture and the Environment, Ames

With some refinement of management techniques, winter cereal grains and frost-seeded forage legumes could play significant roles as third and fourth crops in the corn-soybean rotation. Establishing legumes under cereal grains requires attention to canopy structure, plant height and leaf orientation, all of which affect the amount of light that will be transmitted to the legume seedling. Investigators used frost seeding to determine which winter small grain plant traits enhanced forage legume establishment, and are developing a predictive modeling tool for selecting high-yielding cereal grain varieties suitable as companion crops for forage legume establishment.

Performance of cropping systems designed to reduce nitrate leaching into shallow municipal well aquifers, 3 years

R. DeHaan, Dordt College, Sioux Center

This on-farm project featuring public-private collaboration will assess cropping systems with the potential to produce a reasonable return for farmers, while simultaneously reducing the risk of nitrate-N movement into shallow aquifers. The results will be shared with farmers, municipalities, the Natural Resources Conservation Service, the Iowa Department of Natural Resources and the research community.

Providing shaded pasture with perennial biomass energy plantings, 3 years

R. Hall, ISU natural resource ecology and management; J. Randall, ISU Extension forester for southern Iowa; and R. Abbott, landowner and cow-calf operation manager, Diagonal

On-farm trials continue for agroforestry techniques to improve pastures (silvo-pasture) with tree shade and additional forage while producing woody biomass. Investigators will evaluate the mid-rotation growth phase of one cycle of woody biomass harvest and alley-cropped hay production, which is then converted to

shaded pasture. They also will look at the continued success of initial tilling, a weed mat cover and mowing for hay in reducing competition between planted poplars and red clover/orchard grass pasture.

Quantifying the effect of perennial vegetation on soil and water quality, 3 years

T. Isenbart and R. Schultz, ISU natural resource ecology and management, and K. Schilling, Iowa Department of Natural Resources

The investigators are using data from an established research site (Bear Creek in Story County) to interpret the influence of perennial vegetation on soil biogeochemical processes over time. The information will be used to develop a tool to assess the potential impact of changes in land use on the quality of stream water. The researchers hope to document the influences of perennial plants on various plant communities and groundwater over a period of time.

Quantifying the role of perennial vegetation in removing nitrate from groundwater in riparian buffers, 1 year, ending

W. Simpkins, ISU geological and atmospheric sciences; R. Schultz and T. Isenbart, ISU natural resource ecology and management; and T. Parkin, USDA National Laboratory for Agriculture and the Environment, Ames

This project continues to collect data that document the potential ecosystem services resulting from the conversion of row-cropped lands to perennial vegetation for biofuel feedstock. Ongoing analyses include soil aggregation, carbon dynamics (total and particulate organic matter), microbial biomass and infiltration.

Reconnecting Iowa riparian buffers with tile drainage, 3 years NEW

D. B. Jaynes, USDA National Laboratory for Agriculture and the Environment, Ames

This project will quantify the removal of nitrate from tile drainage by redirecting a fraction of the tile drainage as interflow through riparian buffers. The researchers think that the buffers will allow for the removal of nitrates through the denitrification and sequestration processes, thereby improving water quality in the receiving stream.





**Reducing pesticide use in Iowa vineyards:
Alternatives to herbicides for vineyard weed
management, 2 years, ending**

*G. Nonnecke and P. Domoto, ISU horticulture,
and T. Loynachan, ISU agronomy*

Weed management treatments for Iowa vineyards will be evaluated using a holistic approach by measuring weed growth, grapevine growth and development, and soil characteristics. The project will look at two conventional (tillage and herbicide), and two alternative (straw mulch and living mulch), weed management systems and their influence on weed and grapevine growth and development, fruit quality, and selected physical, chemical and biological soil properties. It also will investigate the influence of using trickle irrigation within conventional and alternative weed management systems.

**Screening winter triticale cultivars and breeding lines
for forage and biomass production, 3 years, ending**

E. Heaton, ISU agronomy

The project objective is to quantify Iowa's forage and biomass production from commercially available winter triticale and rye cultivars, and screening breeding lines of winter triticale for forage and biomass production (double-cropping). Field experimentation and trait assessment trials at Ames and Nashua from 2007 to 2009 include 15 commercial triticale cultivars, 19 experimental triticale lines, five commercial rye cultivars, and two rye/triticale blends. Heaton also has initiated work on other crops (such as miscanthus) suitable for biomass production.

**Site-specific implementation of practices that alter
the spatial/temporal distribution of grazing cattle
to improve water quality of pasture streams in the
Rathbun Lake watershed, 2 years**

J. Russell, ISU animal science

This project will evaluate and demonstrate the effectiveness of site-specific management practices that alter the distribution of grazing cattle. The

goal is to reduce the risk of point-source pollution of streams in pastures of varying size, shape and shade distribution. The researcher will identify site characteristics that optimize these practices, such as stabilized stream access points with or without buffer fencing.

**Soil moisture dynamics and plant transpiration
under contrasting annual-perennial cover types,
2 years, ending**

*M. Helmers and A. Kaleita, ISU agricultural and
biosystems engineering, and H. Asbjornsen, ISU natural
resource ecology and management*

Investigators hope to gain a better understanding of how soil moisture and plant water use vary under differing annual-perennial plant communities. This information will help land use managers understand how placement of different vegetative cover types on the landscape can influence the hydrologic balance and potentially enhance the sustainability of agricultural production systems. Sixteen different treatments (three replications) are being studied, including corn, soybeans, brome grass, switchgrass, winter cover crops in a corn/soybean system and four different native perennial species both in monoculture and polyculture plots (big bluestem, Canada wild rye, false blue indigo and stiff goldenrod).

**Transitioning to ecologically functional
production systems, 3 years NEW**

*K. Hofmockel, ISU ecology, evolution and
organismal biology*

The project seeks to quantify how the composition of different biomass production systems influences above- and below-ground carbon allocation, soil microbial dynamics and greenhouse gas emissions. The goal is to better understand the below-ground mechanisms that regulate carbon and nitrogen cycling in agricultural soils.

Use of mob grazing to improve cattle production, enhance legume establishment and increase carbon sequestration in Iowa pastures, 2 years NEW

J. Russell, ISU animal science

The investigator aims to identify the grazing system that best optimizes the performance of grazing animals, forage mass and quality, legume establishment and the chemical and physical quality of soils in Midwestern pastures. The findings will allow the researchers to compare the effects of mob-grazing, strip-grazing, and rotational grazing on cow body weight and condition score, forage productivity and botanical composition and the chemical and physical properties of the soils in endophyte-free tall fescue pastures seeded with red clover.

Variations in water and nutrient cycling and soil properties during agricultural landscape restoration, 5 years, continued

H. Asbjornsen, ISU natural resource ecology and management; M. Helmers, ISU agricultural and biosystems engineering; M. Liebman, ISU agronomy; L. Schulte-Moore, ISU natural resource ecology and management; and R. Kolka, USDA Forest Service, North Central Research Station

The research team is examining differences in nutrient, water, and carbon storage and output for selected mixtures of annual and perennial plant communities, and providing educational opportunities about the results. They theorize that producers can reduce nutrient loads, improve water management and maintain or improve agricultural productivity by strategic integration of perennial plants in agricultural landscapes. This project work has been continued as a working group, see page 24.



Marketing and Food Systems Initiative

The Marketing and Food Systems Initiative funded 16 pre-proposals received from the Summer 2009 RFP. Another 13 projects were renewed for a second year of funding or given extensions to complete their work.

Marketing Initiative existing grants – Renewals were given to 8 projects for second year of funding.

Total amount awarded – \$135,036

Total number of projects – eight

New Marketing Initiative grants – FY2010

Total amount awarded – \$298,739

Total number of projects – 16

Accelerating Latino leadership in educational initiatives for entrepreneurial and ecological farming: Building a culturally-responsive community of practice, 2 years

K. Richardson Bruna, ISU multicultural and international curriculum studies

Project was cancelled in 2010 due to continued delays and changed community circumstances.

The actual cost of food systems on roadway infrastructure, 1 year, extended

O. Smadi, ISU Institute for Transportation

Using Iowa Department of Transportation data on the highway system, this project will develop a systematic approach for evaluating the actual cost of moving food from farms to markets. Investigators will look at these topics: environment (carbon emissions and air quality), infrastructure, energy (fuel), congestion, safety and user costs.



Assessing the business development strengths and needs of women and Latino farmers in Iowa, 1 year NEW

H. Van Auken, ISU management; L. Adcock, Women, Food and Agriculture Network; and H. Lewis, National Center for Appropriate Technology

This project will assess the business skills and decision-making of women and both male and female Latino farmers in rural Iowa who are engaged in small-market farming.

An automated mechanical intra-row weed removal system for vegetable crops, 2 years

L. Tang, ISU agricultural and biosystems engineering

The investigators want to develop a practical mechanical intra-row weed control solution for automatically removing weeds from vegetable crops for small and mid-scale Iowa growers. After conversations with several growers, the researchers began to design sensing and actuation systems, searched for appropriate electric motors and linear drives, and began developing software for the real-time stereo camera that will capture color and depth images. They constructed a prototype weeder, and began field tests to continue through 2010.

Building a food system framework to advance the health of Iowans - A blueprint for action, 2 years NEW

M. Devlin, University of Northern Iowa, Cedar Falls, and A. Tagtow, Elkhart

Investigators will conduct an assessment of food security, public health and agriculture to create a blueprint for a healthy food system that can support healthy Iowans, farms and communities. Their Food Access and Health Working Group, which first met in May, has joined the Value Chain Partnerships project, Iowa's network for food and agriculture working groups.

Building the Iowa wine culture through improved quality, 1 year NEW

R. Hansen, ISU Extension Value Added Agriculture Program, and M. Dharmadhikari, Midwest Grape and Wine Institute

The researchers will assemble the first-ever "State of the Viticulture Industry" quality report for Iowa by conducting quality analyses of wines collected across the entire state, and correlating that quality review with vineyard and landscape characteristics such as slope and soil type.

Building student awareness and involvement in the Farm to ISU Program, 1 year, extended

N. Levandowski, ISU Dining Services

This project will attempt to increase ISU students' awareness of the Farm to ISU Program and interest in local foods. A graduate researcher will create an educational campaign and ways for students to get involved and then will conduct a longitudinal survey of ISU students to evaluate changes in their perceptions of local products.

Connecting family, community, and health from a food system perspective, 2 years NEW

K. Greder, ISU human development and family studies

Looking for ways to increase the amount of locally grown food consumed by area residents, the project will test methods such as linking families to where food is grown, engaging families in facilitated parent/child food cooking workshops and facilitating dialogue with families, local growers and community leaders.

Cultivating the agrarian dream: Aspiring agri-entrepreneurs helping one another choose their path, 2 years

J. Lawrence and A. Larson, ISU Agriculture and Natural Resources Extension

The delivery of half-day farm business planning workshops begun in February 2010 will continue in the second year of the project, along with follow-up communication with local cohorts of agri-entrepreneurs, and evaluation work to measure intermediate-term impacts of the program. The





programming helps participants assess their current position and determine what resources and direction they need to pursue their ambitions.

Developing and implementing a strategic plan for farm-to-school programs in northeast Iowa, 2 years

B. Ranum, ISU Extension, Winneshiek County

School districts and colleges, distributors, farmers and other local partners will work together to help increase access to and the consumption of fresh, local healthy foods for kindergarten through 12th grade and college students and faculty. Farm-to-school sites were selected, lessons featuring local food items were developed for teachers to use in future education programs, a workshop was held for the pilot school teams, meetings were held for food service directors and producers, and word was begun on school garden projects with the help of Master Gardeners.

Developing production, processing and marketing of aronia berries on small family farms in southeast Iowa, 2 years

P. O'Malley, ISU Extension, Johnson County, and J. Lawrence, ISU Agriculture and Natural Resources Extension

Four family farmers were selected to participate and they planted approximately five acres of commercial aronia plantings in four southern Iowa counties. An initial berry analysis was conducted to determine a baseline assessment of characteristics of the aronia berry and its juice. Initial market research was conducted by the ISU Value Added Agriculture program and a web-page established on the Agricultural Marketing Resource Center website.

Engaging community planners with local food systems producers to integrate local food systems into community plans and policies, 1 year NEW

A. Vandelaar, ISU Extension, Perry

The goal of this project is to engage community planners and local elected officials with local food systems stakeholders and leaders to better integrate local food systems into community plans and policies. Several focus groups will be conducted later in 2010.

Enhancing value and marketing options for pawpaw (*Asimina triloba*) by developing pulp separation and preservation techniques, 2 years

P. O'Malley, ISU Extension, Johnson County

Six hundred pounds of pawpaw fruits from an ongoing pawpaw cultivar trial orchard in Louisa County (funded by the Leopold Center earlier) were delivered to an ISU food science lab. After several attempts, the last run through a modified pulper produced a yield of 53 percent seed- and skin-free pulp. Pulp was frozen with and without ascorbic acid and was analyzed and evaluated for content and recipe use. Pulping methodology was to be further refined in 2010.

Evaluating the impact of regional food system work on growers, 1 year NEW

A. Geary, Center for Energy and Environmental Education, University of Northern Iowa, Cedar Falls

The investigator will evaluate the impact on Cedar Valley growers from regional food system development over the past decade. The study will examine to what extent growers have experienced greater profitability or increased market access that can be attributed to regional food systems projects.

Experiential educational engagement with working groups and communities of practice, 1 year

B. Wells, ISU sociology

This project helped create a spring 2010 model course for teaching, outreach and extension at ISU that linked networks established by the Center's Marketing and Food Systems Initiative with the ISU Graduate Program in Sustainable Agriculture.

Feasibility study for the creation of a meat processing training program in Iowa through the community colleges, 1 year, extended

G. Sandholm, Webster City Area Development

The project objective is to measure current interest, commitment and demand for formally trained meat cutters in Iowa. Investigators will involve the entire range of meat processors opportunities in Iowa – all 15 community colleges, ISU meat science training programs and other available training resources.



A food distribution network for the Northern Iowa Food and Farm Partnership, 1 year, extended

A. Geary, Center for Energy and Environmental Education, University of Northern Iowa, Cedar Falls

The Northern Iowa Food and Farm Partnership will help growers build a pilot distribution network, working with a group of 12 producers who have been meeting for some time. The project will include an analysis of the group's business development options and development of distribution logistics and a business/marketing plan.

From farm to market in northwest Iowa, 1 year NEW

D. Heissel and D. McDonald, Iowa Lakes Resource Conservation and Development

Educators will determine the feasibility of a specialty food grower cooperative for northwest Iowa, specifically for the Spirit Lake and Dickinson County area which has a large seasonal population influx due to summer tourism.

Growing Up Local: A Value Chain Analysis of Local Produce in Iowa, 2 years

B. Mennecke, ISU supply chain and information systems

The researchers conducted site visits and interviews to identify the values and experiences for stakeholders in the local produce chain. Data collection and analysis of constraints in the produce supply chain will continue in the second year of the project, and investigators will drill down further to gauge what structure and antecedents have led to success for some local supply chains.

High-tunnel resource manual and producer resource kit providing the tools for profitability, 2 years

R. Hansen, ISU Extension Value Added Agriculture Program

The Iowa High Tunnel Fruit and Vegetable Production Manual developed in 2009 was used in the second year of the project as the training manual and workbook for several workshops at the Armstrong Research and Demonstration Farm and Marshalltown Community College. Follow-up surveys will be sent to determine if

participants used the high tunnel production strategies and if so, whether they have increased their productivity and profitability. The goal of this work is to boost the number of full- and part-time specialty growers in Iowa, and increase the supply of local fruits and vegetables.

Impacts of GAPs and post-harvest handling practices certificate training on producers' on-farm food safety behaviors and perceptions of customer assurance, 2 years NEW

C. Strobbeln, ISU apparel, educational studies and hospitality management, and M. Smith, ISU Extension Value Added Agriculture Program

Training will be provided for fruit and vegetable growers on good agricultural practices (GAPs) and post-harvest handling best practices recognized and accepted by medium- and high-volume retailers and food service companies. Investigators also will assess the impact of this training on farmers' knowledge and implementation of GAPs and post-harvest handling best practices, and how it has been used to develop an on-farm food safety plan.

Improving veterinary care for organic livestock producers, 1 year NEW

B. Wells and J. O'Neill, ISU sociology

A survey of organic livestock producers in Iowa will assess the quality of available veterinary care and develop recommendations to improve veterinary outreach and education for this group.

Increasing access to healthy, fresh, and local food to students in three rural public schools in northeast Iowa, 2 years NEW

A. Geary, Northern Iowa Food and Farm Partnership

This project will seek to develop reliable supply lines from local farmers to participating schools, including Dike-New Hartford, Beaman-Conrad-Liscomb-Union-Whitten and Clarksville. Plans are to convene a working group of participants/stakeholders, offer mini-grants to participating schools and create a communications plan to market the fresh and healthy meals to students, parents, and school staff.





Mapping potential foodsheds in Iowa: A system optimization modeling approach, 2 years NEW

G. Hu, ISU industrial and manufacturing systems engineering

The investigator and collaborators will gather information on the dietary needs of population centers in Iowa, determine each area's capabilities to grow food locally and create a model that shows food transportation costs throughout the state. The aim is to develop a software tool that will help food system practitioners, planners and policy makers better utilize land and transportation resources in developing more local and regional food systems.

Measuring the economic impacts of local food initiatives at the regional level, 1 year

D. Swenson, ISU economics

Three regional groups (Southeast Iowa Food Network in Jefferson, Van Buren and Davis counties; an eight-county group surrounding Waterloo and Cedar Falls; and the Cultivators in southwest Iowa) received help to gauge potential economic impacts of increased production and consumption of local food products. Swenson provided reports on local food potential in southwest (www.leopold.iastate.edu/research/marketing_files/swiowa.html) and southeast (www.leopold.iastate.edu/research/marketing_files/seiowa.html) Iowa.

New champions expanded scope: Developing an action plan for building an expanded regional food economy in Black Hawk and surrounding counties, 3 years, extended

K. Ensbayan, Center for Energy and Environmental Education, University of Northern Iowa, Cedar Falls

This grant has built capacity for a stronger regional food economy in the eight-county region around Black Hawk County. The Northern Iowa Food and Farm Partnership formed in winter 2007-8 included members who are farmers, retailers, bankers and educators.

Pottawattamie County Farm to Fork (Phase III), 2 years

S. Frederiksen and M. Houser, Golden Hills Resource Conservation and Development, Oakland

The goal of this project is to build the production capacity of the local foods economy in Pottawattamie County. The newly hired local food coordinator began work on a database of local food producers, helped stage cooking demonstrations in concert with local farmers, and started organizing a farm-to-school committee for Pottawattamie County. A web site (www.swiffi.org) and a blog were created to help increase awareness of local food councils, the regional food group, and the coordinator's activities.

Producer machinery and labor sharing arrangements workshops, 2 years, extended

D. Jarboe, ISU Center for Crops Utilization Research

Three workshops were conducted in 2007 to explain the pros and cons of producer machinery and labor sharing arrangements to producers and agribusinesses. Building on these events managed by former ISU Extension economist Roger Ginder, the investigator will prepare two new case studies on intergenerational transfer to supplement the case studies already done on producer resource sharing. Information from these case studies will help them develop additional workshops on machinery and labor sharing arrangements. Information from these case studies will be shared at future Extension workshops.

Regional flavors, 2 years NEW

S. McGill and A. Gaffey, ISU Extension, Flavors of Northwest Iowa

The organizers will create a Loess Hills marketing plan and brand for local and regional foods, dedicate staff to make the partnership effort more effective and create more delivery mechanisms, educational materials, maps and other information for potential consumers and farmers.



Research and assistance in support of the foodsheds in the upper Midwest initiative to measure the economic impacts of increased local food production and consumption, 1 year, extended

D. Swenson, ISU economics

This study analyzed various foodsheds in a six-state region. The report is available at www.leopold.iastate.edu/research/marketing_files/Midwest_032910.pdf

Routing foods into southeast Iowa, 1 year

E. Humble and D. Dettman, Pathfinders Resource Conservation and Development, Fairfield

The Routing Foods into Southeast Iowa initiative will determine the ease of creating a farmer-led cooperative brokerage in an area including, but not limited to, Davis, Jefferson, Keokuk, Mahaska, Van Buren and Wapello counties. To do this, the team will research existing local food cooperatives, meet with food producers to assess their interest in a supplier network and production capacity and meet with buyers to determine their willingness to purchase local food.

South central Iowa local foods network, 1 year NEW

J. Sellers, ISU Extension, Chariton, and K. Dennis and T. Wheeler, South Central Iowa Area Partnership

Educational programs will be launched to develop local markets for producers and help consumers understand the importance and benefits of local foods. The project also will examine the feasibility of creating a south central Iowa local foods network to link the efforts of 20 area food producers.

Transitioning the Pork Niche Market Working Group to self-sufficiency, 1 year NEW

G. Huber, Practical Farmers of Iowa

Huber will develop a business plan to best position the Pork Niche Market Working Group for the future.

Transplant production decision tool for vegetable producers, 2 years NEW

J. Ward, Iowa Organic Association, and C. Blanchard, Decorah

A web-based tool will be developed for producers that will help them invest appropriately in growing and adapting systems as market opportunities arise. The tool will inform producers about their options for purchasing transplant equipment

Update of the Iowa Produce Market Calculator Web site, 1 year, extended

S. Nambisan, ISU Institute for Transportation

The project investigator developed a new revised version of the Produce Market Potential Calculator that will allow the user to map fruit and vegetable demand within a designated distribution region originating from any municipality in the state of Iowa.

Policy Initiative

The Policy Research Initiative funded one pre-proposal received from the Summer 2009 RFP.

Policy Initiative existing grants - Renewals for second year of funding

Total amount awarded - \$35,539

Total number of projects - one

New Policy grants - FY2010

Total amount awarded - \$25,000

Total number of projects - one

Iowa farmers and credit, crop insurance and sustainable agriculture, 2 years

C. Peterson, Iowa Farmers Union, Ames

Through the results of the project surveys and focus groups, more people involved in agriculture will be educated regarding the interaction between sustainable agriculture and agricultural financial and risk management initiatives.





Renewable energy feed-in tariffs: Potential opportunities for Iowa’s small farmers, 1 year NEW

N. Baer, Iowa Environmental Council, Des Moines

The Iowa Environmental Council, Iowa Farmers Union, and National Center for Appropriate Technology will conduct research on a promising policy mechanism to significantly boost renewable energy production on Iowa farms, known as a feed-in tariff. This study looks at the impacts that feed-in tariffs are having in areas where they are currently being used and will create some Iowa-specific modeling to examine the positive and/or negative impacts that such a policy might have on Iowa farmers as well as the utility companies that serve Iowa farms.

State policy alternatives for biofuels industry support of sustainable production of biofuels feedstocks, 2 years, extended

D. Sand, Iowa Natural Heritage Foundation, Des Moines

This project will research public policy options that reward linking the growing bioeconomy to environmental stewardship. It will explore and articulate some traditional funding options as well as some new, creative ideas. The ideas will evolve and improve during the project, as a variety of perspectives and information emerge during a series of interviews with policy makers.

Grass-Based Livestock Working Group, 3 years

J. Lawrence and A. Larson, ISU Agriculture and Natural Resources Extension

The group meets quarterly to build community and facilitate information exchange among grass-based livestock producers and marketers, as well as their supporters in academia, state government and not-for-profit organizations. It also provides small grants to interdisciplinary teams of researchers and outreach professionals for projects to address topics of concern in grass-based livestock production, marketing, ecology and policy.

Meeting on-farm energy needs through conservation, efficiency and renewable energy, 2 years

K. Enshayan, Center for Energy and Environmental Education, University of Northern Iowa, Cedar Falls

A Farm Energy Working Group was formed to support the implementation of a variety of energy conservation, efficiency and renewable energy practices to meet on-farm energy needs of Iowa’s small and midsize farms. Group members include representatives from organizations such as Practical Farmers of Iowa, Iowa Farm Bureau Federation and the Iowa Energy Center, as well as farmers with an interest or expertise in using renewable resources for on-farm energy uses.

Cross-initiative projects with aspects related to all three initiatives

Exploring the role of multifunctional agriculture on the future of agriculture and rural development, 2 years NEW

T. N. Papanicolaou, University of Iowa hydroscience and engineering, Iowa City

The project researchers intend to gain an understanding of the interplay between climate shifts and management practices as applied to the sustainability of healthy soils and the development of sound agricultural policies in the United States.

Toward a new Homestead Act: Designing a farmstead transfer and leasing program for high-value farming and farmstead preservation, 1 year NEW

H. Lewis, National Center for Appropriate Technology

What motivates landowners, beginning farmers and immigrant farmers to participate in preserving and transitioning Iowa farmsteads? The investigator will use the findings to make recommendations for policy and programs that could help increase farmland transfer to new operators such as beginning and immigrant farmers.



LEOPOLD CENTER
FOR SUSTAINABLE AGRICULTURE

209 CURTISS HALL - AMES, IA 50011-1050
PHONE (515) 294-3711 - FAX (515) 294-9696
E-MAIL LEOCENTER@IASTATE.EDU - WEB WWW.LEOPOLD.IASTATE.EDU

Join us in preserving our natural resources.

Environmental savings from the printing of this report:

-  17 trees preserved for the future
-  7,218 gallons wastewater flow saved
-  799 pounds solid waste not generated
-  1,572 pounds net greenhouse gases prevented
-  12 million BTUs energy not consumed



This report is printed with soy ink on Cascades Rolland Opaque50, and is 50% post-consumer recycled. This environmentally responsible paper choice is FSC Mixed Sources certified, EcoLogo certified, Permanent Paper, Elemental Chlorine Free and manufactured using biogas energy.