



LEOPOLD CENTER  
FOR SUSTAINABLE AGRICULTURE

Annual  
Report  
2011-12

## Table of Contents

### Internal Affairs

- 3 // Director Named
- 4 // Interim Director's Letter
- 5 // New Director's Letter
- 6 // Kirschenmann Activities
- 8 // Staff and Advisory Board
- 9 // Financial Update

### Outreach

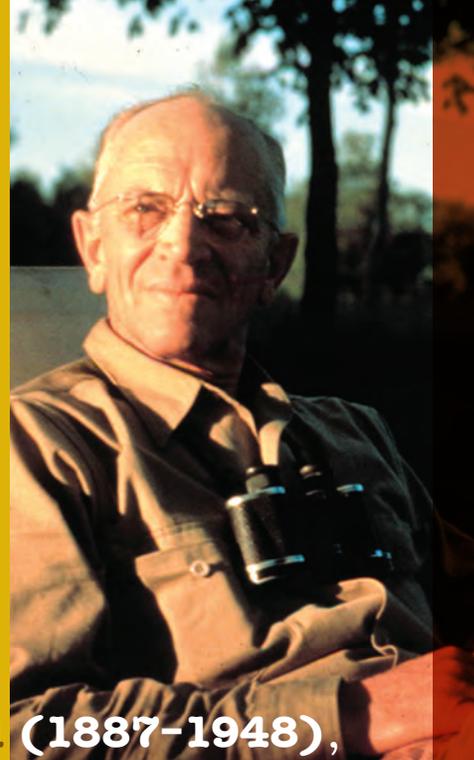
- 10 // Spencer Award
- 11 // Shivvers Lecture
- 12 // CESP Report
- 13 // Symphony of the Soil

### Strategic Investments

- 14 // GPSA Students
- 16 // Wallace Chair
- 17 // Iowa Learning Farms

### Research

- 18 // Ecology Initiative
- 20 // Marketing and Food Systems Initiative
- 22 // Policy Initiative
- 24 // Cross-Cutting Initiative
- 26 // Competitive Grants Program



**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.

Edited by Mary Adams  
Designed by julsdesign inc.,  
Ankeny, Iowa

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“On motionless wing they emerge  
from the lifting mists, sweep a final  
arc of sky, and settle in clangorous  
descending spirals to their feeding  
grounds. A new day has begun  
on the crane marsh.”

- Aldo Leopold, *A Sand County Almanac*,  
“Wisconsin- Marshland Elegy”

## A new day at the Leopold Center

After two years without a permanent director, when the Leopold Center staff sometimes felt betwixt and between several temporal planes, the second official search process yielded a new leader. Mark Rasmussen, a microbiologist with an extensive professional career in ruminant animal nutrition studies, was named as the Center’s director in January 2012 and officially took office on June 1.

Rasmussen inherits an operation with a seasoned, veteran staff, eager to continue to educate the public and encourage long-term sustainability and resilience in Iowa agriculture. He will oversee the robust competitive grants program, a modest portfolio of infrastructure investments in graduate students and on-farm conservation work, working groups of all stripes, an array of outreach activities and an advisory board primed and eager to explore some of the larger questions facing contemporary agriculture. All agree that if the Center keeps chasing yesterday’s questions, we may miss tomorrow’s answers.

The new Leopold Center director has already indicated his strong interest in asking “what if” questions about the future of agricultural enterprises of all sizes. Sometimes those questions will be straightforward and easy to research. Other times the Center will take a chance on cutting-edge projects or research that moves away from the well-trod academic path to uncover a new route to sustainability. As long-ago First Lady Eleanor Roosevelt opined, “With the new day comes new strength and new thoughts.”

At the March 2012 advisory board meeting, the board members took turns reading aloud the text from the Groundwater Protection Act of 1987 which created the Leopold Center. That exercise was a reminder for everyone in the room. The consensus was that the GWPA had granted the Center a wide-ranging mandate—perhaps an optimistically broad one given the resources available—to pursue economically and environmentally healthy alternatives for Iowa agriculture. With a new leader and renewed purpose, we hope to do precisely that in the years ahead.

Mary Adams  
*Editor*



## From the Interim Director

03/07/11  
06/01/12

In reflecting on my time as interim director of Leopold Center, I am amazed at all that occurred and was accomplished. A successful search for a permanent director was conducted, thanks to the work of many. A new website was launched after months of preparation. We said farewell to long-time staffer Rich Pirog and welcomed Craig Chase as leader of the Center's Marketing and Food Systems Initiative. The Center's initiatives continued to develop, particularly the Policy and Cross-Cutting units. The Iowa Farm and Food Plan was activated with Craig Chase's leadership. A successful Sustainability and Resilience Conference was held. The Center observed its 25th anniversary. The Value Chain working groups made the transition to self-government and self-sufficiency. The Center invested in the successful Iowa Learning Farms project.

Iowa and Iowa agriculture are better for the Leopold Center and the Center's efforts. Advancements such as riparian buffer strips, local foods, hoop barns for livestock, high tunnels for vegetables, niche markets, water quality, and soil conservation can all be traced to Iowa's Leopold Center.

The Center's leadership has had remarkable impact. I challenge the Leopold Center to continue this leadership role and to be a beacon of change rather than a lightning rod of controversy for Iowa and for agriculture.

Nearly 27 years ago as a graduate student at ISU, I was included on a task force to develop an outline for a new center related to farming and the environment. I had no idea that the report would one day result in legislation creating the Leopold Center. Later, I had the good fortune to benefit from the Center as a researcher and teacher. Recently, I was able to serve on the Leopold Center's leadership team as interim director. At all times, I benefitted from the stream of Leopold Center ideas, meetings, and interactions. Thank you to many who make the Center so vibrant. Keep up the good work.

Mark Honeyman  
*Interim Director*

## NEW DIRECTOR selected for Leopold Center

### Search Process

The search process begun in June 2011 yielded a new director for the Leopold Center at the end of the year. The official ISU search committee headed by Sharron Quisenberry, then-ISU Vice President for Research and Economic Development, included five ISU representatives and four members of the Center's advisory board (Jennifer Steffen, Bill Ehm, Keith Summerville and Dan Frieberg).

Applications were due September 30 and were vetted by the search committee. Three candidates were invited to campus for interviews with various interest groups and gave public presentations in November and December. The finalists were Abdullah Jaradat (research leader, USDA-ARS Soil Conservation Laboratory in Minnesota), Thanos Papanicolaou (engineer and professor in civil and environmental engineering at the University of Iowa) and Mark Rasmussen (supervisory microbiologist with the Food and Drug Administration's Center for Veterinary Medicine in Laurel, Maryland).

At the advisory board's December 9 meeting in Ames, the group discussed the three candidates in light of the recommendations from the search committee, and prepared their list of acceptable applicants to be submitted to the ISU chief executive for his decision. In early January 2012, outgoing ISU president Gregory Geoffroy appointed Rasmussen as the Leopold Center's director.





## Rasmussen Chosen

Rasmussen, a Nebraska native, grew up on a crop and livestock farm where his family relied on a number of conservation techniques (waterways, terraces, crop rotations) to keep the land in production. He holds degrees in agriculture and animal science from the University of Nebraska-Lincoln, a Ph.D. in dairy science from the University of Illinois-Champaign-Urbana, and an M.B.A. from Iowa State.

Rasmussen spent 18 years as a scientist and research leader at the U.S. Department of Agriculture's National Animal Disease Center in Ames before moving to the Washington, D.C. area to join the Food and Drug Administration research program in 2009. He also has worked on animal nutrient research for private industry in Anoka, Minnesota, and Kingsport, Tennessee.

The search committee was impressed with Rasmussen's record that combined on-farm experience with strong academic credentials, professional service in several science-based positions, and a high-quality background in livestock-related research.

My official tenure as director of the Leopold Center began as this fiscal year was drawing to a close. But my preparation for joining the Center started well before I arrived in Iowa in late May. I attended the premiere of the film "Symphony of the Soil" directed by Deborah Koons Garcia at its showing in Washington, D.C. at the Smithsonian Natural History Museum on March 25, and the Center hosted an Iowa showing just a few days later. In late April, I attended a workshop in Washington, D.C., on behalf of the Center. It explored "The True Cost of Food" and was organized by the Institute of Medicine of the National Academies. It was a good follow-up to the Center's local food summit that I participated in earlier that month in Ames. These events are indicative of the long-standing interest in sustainable agriculture that propelled me back to central Iowa after several years with the Food and Drug Administration.

This is an exciting time to return to Iowa and Iowa State and begin work at the Leopold Center. I have spent a great deal of time during my first months at the Center traveling throughout the state, looking at different farming practices and talking to people about agriculture and food systems. I came to this opportunity as the Leopold Center celebrates its 25th anniversary, but also in the middle of a drought of historic proportions that is still weighing heavily on people's minds. As you might imagine, there is a great diversity of opinions about the future, even in a heavily agricultural state like Iowa.

I am pleased that I can be a part of this organization with its long history of making a difference in Iowa agriculture. As I continue delving deeper into the work that the Leopold Center has supported over the years, I am impressed with the diversity and variety of work the Center has sponsored. This annual report provides summaries on the research, demonstration and education supported by the Center during the recently ended fiscal year. My goal is to add to and improve upon the significant record the Center has built over the last 25 years.

Mark Rasmussen  
*Director*

*Kirschenmann (right)  
received a PFI Award.*



## Distinguished Fellow contributes to wide-ranging agricultural outreach efforts

Fred Kirschenmann, who has been the Leopold Center's Distinguished Fellow since 2005, remains in high demand for speeches and presentations throughout Iowa and the nation. He annually responds to numerous requests for help in illuminating some of the more comprehensive and challenging issues related to sustainable agriculture. In his role at the Leopold Center in Iowa and as board president at the Stone Barns Center for Food and Agriculture in Pocantico Hills, New York, he has opportunities to engage farmers as well as food entrepreneurs, chefs and food citizens in both rural and urban communities.

Kirschenmann continues to provide leadership for the Agriculture of the Middle project. This program seeks to promote opportunities for farmers to aggregate into marketing networks to produce differentiated food products with their own brand. The project organizers currently are exploring a potential collaboration with the Food Commons project that evolved on the West Coast. It will provide ways for farmers to work with regional food markets to create supply/demand relationships that would reward farmers while providing regional communities with food security based on mutually beneficial relationships. Recent inquiries about such farmer marketing networks have come from farmers as far away as Ireland. Through his affiliation with the National Sustainable Agriculture Coalition based in Washington, D.C., Kirschenmann also provides input to farm policy deliberations and discussions related to the needs of midsize farms.

At the Stone Barns Center, his work focuses primarily on the education of children (especially from urban areas), helping them to understand where food comes from, how to grow and prepare it, and how to appreciate and enjoy the experience of growing food. He also is heavily involved in the rapidly expanding beginning farmer program at Stone Barns. It aims to provide more training for beginning farmers in the Northeast and other regions.

During the past year, Kirschenmann gave 31 presentations on sustainable agriculture throughout the United States and Canada, including to the Iowa Environmental Council, Cornell College (Mount Vernon, Iowa), the Niman Ranch annual dinner and the Midwest Rural Agricultural Safety and Health Forum, both held in Des Moines. He also served as a "Scholar in Residence" at the Green Mountain College (Vermont) Sustainable Agriculture Graduate Program, and gave speeches on sustainable agriculture at the University of Florida, University of Vermont, University of Minnesota, Ramapo College of New Jersey, Monterey Bay Aquarium, New America Foundation, and the Cathedral of St. John the Divine (New York City). Kirschenmann was invited to do a TEDx presentation on soil for the TEDx Manhattan event that can be viewed at [www.leopold.iastate.edu/news/calendar/2012-01-21/changing-way-we-eat](http://www.leopold.iastate.edu/news/calendar/2012-01-21/changing-way-we-eat).

## Evaluation efforts begin to pinpoint Center

In the past decade, the Leopold Center has funded more than 480 projects totaling nearly \$18M to support agricultural research, education, and outreach that promotes healthy communities and landscapes in Iowa. In 2011, Leopold Center evaluator, Corry Bregendahl, convened a meeting with Leopold Center staff to outline first steps for determining the extent to which long-term funded work has achieved Leopold Center goals. At this initial meeting, six of the most influential projects were identified; each has received long-term funding from the Leopold Center. They are:

- **Low-Input-High-Diversity.** \$313,854, 2004-2012. Performance comparisons of conventional and diverse crop rotation systems.
- **Long-Term Agro-ecological Research.** \$900,000, 1998-2012. Comparison of organic and conventional agriculture and cropping.
- **Hoop houses.** \$430,300, 1997-2012. Comparison of hoop structures versus conventional facilities for livestock production.

# Leopold Center launches new website

The Leopold Center's new website went "live" in September 2011, sporting a new look and features designed to make it easier for users to find out what's been learned from the Center's many projects and partnerships. Visit the site at [www.leopold.iastate.edu](http://www.leopold.iastate.edu).

The revamped site offers a central location to showcase results of Leopold Center-supported research, programs and in-house projects. The site displays more than 200 "Pubs and Papers" including the Leopold Center's widely quoted "food miles" reports, directories, guides, extension publications and other materials. Users also can find details about nearly 500 projects that are or have been part of the Center's long-running competitive grants program. Competitive grants now can be followed from their award date to completion, with links to information related to the project.

Other features include:

- Home page photo showcasing a different partner or project every week;
- Cool Tools page, with links to online calculators, directories, planners and other websites that have been developed with Leopold Center support;
- "Share" button next to news items allowing users to post a link on Facebook or Twitter accounts, email or bookmark, and
- News feeds that will automatically send subscribers links to all news releases and the Center's monthly and quarterly newsletters.

The website takes advantage of new technology that offers consistency, more flexibility in maintenance, and the ability to connect content throughout the site. Web pages are

updated automatically when news releases, publications, photos and the Center's popular On the Ground videos are added.

Leopold Center communications specialist Laura Miller managed the project with support from graduate research assistant Melissa Lamberton and former undergraduate intern Amy Thompson. julsdesign, inc. of Ankeny (designer of this annual report) created the initial page design; former Leopold Center graphic design interns Tori Watson and Tina Marks supplied additional visual elements. Technical expertise was provided by John Rearick, ISU Brenton Center for Agricultural Instruction and Technology Transfer.

The Leopold Center's World Wide Web presence began in 1995. In 2004, user-friendly summaries of all completed research projects were added to the site using a new design. The latest upgrade rebuilt the site from the foundation up.



## achievements

- **Bear Creek Watershed Demonstration Project.** \$900,000, 1990-2012. Working with landowners to mitigate detrimental effects of agriculture on the landscape by installing a chain of riparian buffers.
- **Regional Food Systems Working Group.** \$646,640, 2003-2012. Engaging diverse value chain partners in regional food systems development.
- **Practical Farmers of Iowa.** \$650,000, 1997-2012. Connecting Iowa farmers with PFI staff and researchers to investigate on-farm research and demonstration priorities.

Sociology graduate student Laura Kleiman has been contacting project investigators and key partners from the six projects to expand on what we know about each program from existing project documents. Kleiman and Bregendahl also are preparing a brief for each project to share with stakeholders what outcomes were associated with Leopold Center investments. The briefs will distill into two pages a description of each project, partners, scientific goals and findings, personnel supported, products generated, outcomes, leverage and future opportunities.



## Leopold Center Staff 2011-2012

\*part-time or shared appointment // \*\*served part of the year

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**Malcolm Robertson\*** // Cross-Cutting Initiative Coordination and Outreach // [malcolmr@iastate.edu](mailto:malcolmr@iastate.edu)

## 2011-2012 Leopold Center Advisory Board

**Joe Colletti** // Senior Associate Dean  
*College of Agriculture and Life Sciences,  
Iowa State University*

**Bill Ehm** // Director  
*Environmental Protection Division,  
Iowa Department of Natural Resources*

**Dan Frieberg**  
*Agribusiness Association of Iowa, West Des Moines*

**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 (chair)*

**Patrick Pease** // Professor of Geography  
*University of Northern Iowa*

**John Sellers, Jr.** // Farmer  
*State Soil Conservation Committee, Corydon*

**Jennifer Steffen** // Farmer  
*District Soil and Water Commission, Birmingham*

**Keith Summerville** // Associate Dean  
*College of Arts and Sciences 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

The format of the financial statements in this annual report reflects the ongoing efforts for more transparency begun with last year's report. The state Agriculture Management Account (AMA) receipts are presented on an accrual basis and the Competitive Grants and Grant Infrastructure funds expended include only the cash paid out during the year (not the total amount awarded).

## Years Ended June 30, 2011 and 2012

<b>Funds Received</b>	2012	2011
State AMA Receipts	\$1,639,734	\$1,584,737
ISU Allocations	426,270	440,861
Foundation Funds	175,824	149,361
Staff Leveraged External Grants and Projects	103,249	223,574
Incentive/Discretionary Accounts	506	1,324
<b>Total Funds Received</b>	<b><u>2,345,583</u></b>	<b><u>2,399,857</u></b>
<b>Funds Expended</b>		
Personnel	737,936	822,895
Operations	161,957	196,766
Competitive Grants & Grant Infrastructure:		
Ecology Initiative	790,866	614,399
Policy Initiative	76,428	141,189
Marketing Initiative	337,186	504,357
Cross-Cutting Initiative	290,447	250,794
Monthly Competitive Education Program	9,082	4,600
Total Competitive Grants & Grant Infrastructure	1,504,009	1,515,339
Foundation Accounts	171,083	43,250
Staff Leveraged External Grants and Projects	138,310	284,200
<b>Total Funds Expended</b>	<b><u>2,713,295</u></b>	<b><u>2,862,450</u></b>
<b>Increase/(Decrease) in Funds</b>	<b>(367,712)</b>	<b>(462,593)</b>
<b>Funds, Beginning of Year</b>	<b><u>2,467,341</u></b>	<b><u>2,929,934</u></b>
<b>Funds, End of Year</b>	<b><u>\$2,099,629</u></b>	<b><u>\$2,467,341</u></b>
<b>Competitive Grants AWARDED by Initiative</b>		
Ecology	\$640,389	\$582,055
Policy	105,350	0
Marketing	237,104	208,691
Cross-Cutting (XP)	197,447	481,397
<b>Total</b>	<b><u>\$1,180,290</u></b>	<b><u>\$1,272,143</u></b>

## Leopold Center for Sustainable Agriculture by the Numbers

<b>Programs</b>	<b>FY2009</b>	<b>FY2010</b>	<b>FY2011</b>	<b>FY2012</b>
Active grants	98	96	89	71
New grants	52	44	33	31
Number of pre-proposals received	62	54	54	74
Active working groups	6	9	10	13
Iowa counties with active projects	34	52	58	49
Principal investigators	74	74	67	57
<b>Outreach</b>				
Publications (papers, books, etc.)	41	15	25	59
Website unique visitors (monthly average)	17,129	16,936	16,388	6,452*
Website activity (monthly average)	67,186	75,857	80,873	19,800*
Educational events	236	39	179	163
Reported leveraged funds by LC projects	\$5.147M	\$142,000	\$1.817M	\$1.820M
<b>Center Stats</b>				
Employees	12	12	10	10
Interns/students	12	15	10	4

(\*New website launched September 2011 with different tracking system)





*Spencer Award ceremony. (left to right)  
Joe Colletti, Mark Honeyman, Bernard Havlovic,  
Mickael Natvig, Laura Jackson*

## 2011 SPENCER AWARD - seeing double -



Faced with a difficult choice among several excellent applications, the nominations review committee for the 2011 Spencer Award for Sustainable Agriculture doubled down. For the first time, the Spencer Award was presented jointly to Michael Natvig, a northeast Iowa organic farmer, and Bernard Havlovic, a longtime ISU Research Farm superintendent. The committee was impressed by the qualities of these two men whose achievements complemented each other. They shared a strong interest in on-farm research: Natvig on his family farm near Cresco and Havlovic on four ISU research stations that he has managed around Iowa.



Bernard Havlovic's application showcased his ability to work with researchers and farmers to study a variety of agricultural practices for crops ranging from corn to high tunnel-raised tulips. His efforts with research, outreach and demonstration as part of ISU's outlying research farm system have made a significant contribution to all of Iowa agriculture.

Michael Natvig, a mid-career small-scale farmer from Howard County, has a diversified operation including organic corn and livestock, and has cooperated on Leopold Center research projects studying nutrient and organic matter budgeting. He uses rotational grazing in his pastures, has acreage managed as native prairie and is active in conservation circles. He farms part of the Norman Borlaug Heritage Farm, grazing beef cattle where Dr. Borlaug grew up.

In the view of the committee, both men made unique contributions to the sustainability and vitality of Iowa agriculture, illustrating the best qualities of the land grant university-farmer partnership. This reflects the Spencer family's wish to have the award highlight the significant contributions made by ISU and Iowa's family farmers.

The awards were given at a ceremony at a Leopold Center advisory board meeting held in Ames on March 1, 2012. Advisory board members Laura Jackson and Joe Colletti presented the awards to Natvig and Havlovic, respectively. The winners, their nominators, family and friends joined the board for lunch after the ceremony.

*Bernard Havlovic (top),  
Michael Natvig (left, bottom)  
and Dan Specht (right, bottom)*



## Sandra Steingraber wows crowd at 2012 Shivvers Lecture

Sandra Steingraber, a widely admired writer and ecologist, took to the stage at the ISU Memorial Union on March 4 to present the 2012 Shivvers Memorial Lecture. Speaking on “Environmental Pollution, Climate Change and Our Health,” she took aim at fossil fuel dependence as the root of a myriad of environmental ills.

A rapt ISU audience got an eye-opening first-hand introduction to the increasingly common industrial practice of “fracking,” the process of extracting natural gas from bedrock. It’s not a genteel exercise—the process involves pumping high-pressure fluid into the ground to shatter the bedrock with a host of attendant damage to the groundwater, the microbes in the area, and the larger environment.

How does Iowa figure into this? Steingraber explained that energy companies rely on a certain type of sand from Iowa to help keep open the earthen fractures so the natural gas can escape. The gas then is used to make a variety of petrochemical products that return to Iowa, ranging from farm chemicals to PVC pipes. So even though the state may not have the bountiful reserves of natural gas beneath its surface to draw the attention of energy companies, Iowa is part of the equation that makes fracking an attractive investment.

Steingraber is a biologist as well as a cancer survivor. In her latest book, “Raising Elijah: Protecting Children in an Age of Environmental Crisis,” she speaks as both a scientist and a mother about the joys of bringing up her son while searching for ways to shield him – and all children – in a world facing climate change and increased environmental pollution.

She is scholar-in-residence in the Department of Environmental Studies and Sciences at Ithaca College and has a doctorate in biological sciences from the University of Michigan. She recently was honored with the Heinz Award, given for significant achievements benefitting the environment, and presented her prize money to anti-fracking forces in upstate New York.

Steingraber’s lecture was part of the Shivvers Memorial Lecture series which commemorates L.C. (John) Shivvers, a farmer from Knoxville who had a deep interest in sustainable agriculture.



*Steingraber autographed  
copies of her books.*



## Competitive Educational Support

### Program fuels outreach

Most competitive grants sponsored under the Leopold Center umbrella include some outreach elements to help share their findings with the public. Another way that the Leopold Center helps promote sustainable agriculture outreach activity is through its Competitive Educational Support Program (CESP). Funds from this program support one-time events, programs, workshops, conferences or displays that are educational in nature and uphold the mission of the Center.

Iowa non-profit organizations, agencies and educational institutions are eligible to apply. Application forms can be found at [www.leopold.iastate.edu/grants/education](http://www.leopold.iastate.edu/grants/education) and requests are limited to \$1,000 for each program or event. Applications are reviewed by several Leopold Center staff members and an advisory board member. Administrative specialist Karen Jacobson managed the program this year.

During the past fiscal year, the Center funded 14 grants totaling \$9,082. Some examples:

- Iowa Valley RC&D – promoting aronia berries to RAGBRAI riders
- Iowa Food System Council – funds for speaker Mark Winne to appear at IFSC annual meeting
- Iowa Environmental Council – support for Agriculture for Life conference on local food and sustainable agriculture
- Iowa State Horticulture Society – support for keynote speaker Felder Rushing at 2012 All-Iowa Horticulture Exposition
- Women, Food and Agriculture Network – funding for speaker Debra Eschmeyer and registration scholarships for 2012 WFAN Annual Conference
- Pathfinders RC&D – transportation for presenters at “Cultivating Opportunities” food system workshop
- Iowa Stormwater Education Program – support for speaker Doug Siglin at Iowa Water Conference



*RAGBRAI rider enjoys one of 1,000 aronia berry smoothies given out at Homestead, Iowa.*





The Hollywood red carpet may have been absent, but there were stars of the soil and bags of popcorn at the Iowa premiere of the new documentary film *Symphony of the Soil*. Independent filmmaker Deborah Koons Garcia appeared at two Iowa showings of her latest work: March 28 at Coover Hall on the ISU campus sponsored by the Leopold Center and March 27 at the University of Northern Iowa in Cedar Falls.

*Symphony of the Soil* is a multi-film project that explores the world of soil, including how it is formed, its life cycle, human uses and misuses in agriculture, and soil's role in addressing global environmental problems. The project consists of the feature film as well as several short films on topics such as dry farming, composting, soil-water relationships, and carbon sequestration.

The vastness of the earth's soil riches are chronicled in this film, ranging from Norwegian glaciers to Hawaiian volcanoes to the minute life systems inside the roots of a plant. The film features sustainable agriculture practices of all kinds in an attempt to show how humans affect soil quality most directly by their agricultural systems.

Garcia joined in a lively panel discussion with two ISU agronomy faculty members (Michael Thompson and Robert Horton) following the presentation in Ames. The academics identified soil erosion as the most critical environmental dilemma facing Iowa agriculture. The panel was moderated by the Leopold Center's Fred Kirschenmann, who made a cameo appearance in the film, and noted wryly that "Nobody's going to be able to see this film and still treat soil like dirt." The Leopold Center's Ecology Initiative worked with UNI's Center for Energy and Environmental Education to bring Garcia to Iowa.

Garcia also spoke at the Graduate Program for Sustainable Agriculture Colloquium during her visit to Ames. She talked with the students about how she explains a complicated scientific topic in ways that the general public can understand and appreciate.

# SYMPHONY OF THE SOIL

A movie  
premieres  
in Ames

# Center helps students seeking degrees in sustainable agriculture

The Leopold Center has provided support for the ISU Graduate Program in Sustainable Agriculture (GPSA) since its inception a decade ago. The GPSA used Leopold Center dollars to fund three research assistantships in 2011-12. The FY2012 recipients describe their projects here:

## Justin Landhuis

Natural Resource Ecology and Management, M.S.

Faculty Advisor: John Tyndall

I worked on a project that looks at the Emerald Ash Borer (EAB), an invasive pest, and its likely impact on ash trees and Iowa communities. We designed surveys (mail and phone) for various businesses in three eastern Iowa cities, asking how they were preparing for EAB infestation. We asked when they thought the pest would arrive and how their community networks looked prior to the arrival of the pest. Using this data, we will be able to visualize the whole community network and perform a Social Network Analysis to determine different measures of the network and how information is diffused through it.

After conducting the surveys, we held EAB workshops in the three cities to help businesses and municipalities prepare for the pest. We brought in experts from Illinois to share their experiences with the bug, as well as pest and forest health experts from ISU Extension, the Iowa Department of Natural Resources and the Iowa Department of Agriculture and Land Stewardship. Participants received hands-on training with an on-site portable sawmill in an effort to show that the removal of ash trees also could generate a value-added product (lumber), not just waste products destined for the landfill. A follow-up survey will be used to determine the effects of the workshops and initial survey.

*Emerald ash borer, adults 3/8" - 5/8" long.*



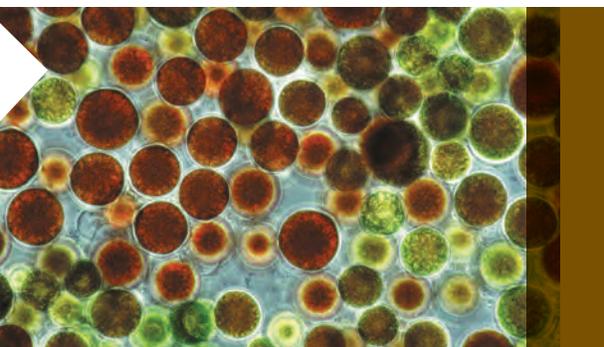
*Microalgae*



**Roshani Malla**  
 Industrial and Manufacturing Systems Engineering, M.S.  
 Faculty Advisor: Guiping Hu

I have been conducting research related to a techno-economic analysis of extraction of vitamin E from microalgae. Vitamin E can be categorized as both a synthetic and natural product and has beneficial effects on human health such as cancer prevention, resistance against aging, and immune enhancement. While 90 percent of today's vitamin E is synthetic, the production process is complex, tedious and expensive. Similarly, distillation, the commonly used process of extracting vitamin E from natural resources, is highly energy intensive and therefore not economically viable. Consequently, research on the development of novel extraction techniques for vitamin E from natural resources is of growing interest.

Brian Trewyn's research group has developed a process that uses a chemically functionalized solid porous silica material to extract vitamin E from microalgae. Microalgae are known to be the source for third-generation biofuels along with several proteins, carotenes, and vitamins. My research focuses on combining technological aspects of Trewyn's group research with economic aspects from Guiping Hu's group in the IMSE Department. I have been involved with designing the process flow diagram, analyzing it through ChemCad software, and evaluating the cost and energy requirements for this new technology in comparison with the distillation process.



**Joseph Malual**  
 Sociology, Ph.D.  
 Faculty Advisor: Robert Mazur

My dissertation research was conducted with small-scale farmers in Lira, northern Uganda. Lira is one of the districts recovering from two decades of violent conflict between the government of Uganda and the rebel Lord Resistance Army, which has resulted in massive loss of life and displacement of rural populations. Following the peace agreement signed in 2006, most of the 1.8 million internally displaced persons have returned home. With large numbers returning to areas devastated by war, these people suffer from lack of food and health services. Disputes over resources, particularly land, are widespread, making it difficult for vulnerable groups, such as female-headed households, the elderly and those living with HIV/AIDS, to improve food security.

My research focus is to understand how agricultural technical support enhances the capacity of small-scale farmers to improve access to productive resources, particularly land, labor, credit and market information. My study also seeks to understand motivations for adopting new agricultural technologies and the impact of these technologies on agricultural productivity and food security in post-conflict Lira.

My experiences in Uganda highlighted issues of population growth, poor or depleted soil, and limited access and inequitable distribution of productive resources, set in the larger context of climate change (manifested by erratic rainfall). I observed growing socio-economic inequality and saw how vulnerable groups suffered from lack of sufficient food and health services. Women dominate agricultural work in Lira, but comprise the most food-insecure segment of the population. International assistance is fragmented in the region and tends to be funneled from the top down, with resources flowing to relatively richer groups.



# CENTER HELPS FUND WALLACE CHAIR GRADUATE STUDIES

The Leopold Center annually provides \$20,000 to support the Henry A. Wallace Chair for Sustainable Agriculture at ISU. The current chair holder, ISU Agronomy professor Matt Liebman, invests the funding in a variety of research, outreach and teaching activities. Work at the Wallace Chair focuses on how to use ecological processes to reduce dependency on agrichemicals and fossil fuels (see [www.wallacechair.iastate.edu](http://www.wallacechair.iastate.edu) for more information). Liebman is pursuing research on:

1) perennial crops and prairie species as biofuel feedstocks; 2) weed suppression via diverse crop rotations and rodents and insects that consume weed seeds; 3) nutrient cycling in integrated crop-livestock systems; 4) energy costs and economic returns related to simple and diverse rotation systems; and 5) the workings of native plant communities in filter and buffer strips constructed in and around corn and soybean fields.

In 2011-2012, Leopold Center funds administered by the Wallace Chair supported two graduate students, Sarah Hirsh and Ranae Dietzel, for whom Liebman serves as major professor. Hirsh studied for a M.S in Sustainable Agriculture and Ecology and Evolutionary Biology. She graduated in the spring 2012 and accepted a job as a program associate at the University of Arkansas Rice Research and Extension Center in Stuttgart, Arkansas. In addition to the financial support Hirsch received from the Center, the Department of Agronomy provided \$12,500. Her research focused on vegetation dynamics in cropping systems using perennial strips in the STRIPS experiment conducted at the Neal Smith National Wildlife Refuge. (The Leopold Center currently funds ISU faculty research on the same project.) Hirsch studied the species composition and relative abundance of different plants in prairie strips, with special attention to the conservation of native species. She also determined the extent to which weeds within the strips migrate into the crop portion of the field and prepared two publications on her work.

Dietzel is pursuing a Ph.D. in Sustainable Agriculture and Agronomy (Crop Production and Physiology). Her research compares carbon cycling in corn- and prairie-based biofuel cropping systems to determine which systems will remove the most carbon from the atmosphere while adding the most carbon to the soil. Work conducted during the last year included measuring and analyzing root growth, developing a model to help determine how much carbon is lost from the systems, and calibrating a model to simulate bio-geochemical processes at the research site. Dietzel was awarded a National Institute of Food and Agriculture (NIFA) Pre-doctoral Fellowship, which will cover her stipend, tuition and fees for the upcoming year.





ILF Conservation Stations

## Leopold Center and Iowa Learning Farms team up for conservation education

Beginning in early 2012, the Leopold Center provided \$50,000 annually for three years to the Iowa Learning Farms (ILF) to enhance and expand its operations. ILF is a partnership among the Leopold Center, Iowa Department of Agriculture and Land Stewardship, Iowa Department of Natural Resources, Natural Resources Conservation Service, and Iowa State University Extension and Outreach.

Thanks to more than 20 yearly workshops and/or field days, Iowa Learning Farms continues to expand its outreach efforts with farmers and educators. ILF added several new farmer partners and many of the field days were held at new locations. The whole-farm demonstrations encouraged by ILF allow farmers who practice conservation to share their successes. Their experiences have been valuable in guiding other farmers toward adoption of improved conservation practices.

People frequently turn to the expertise of ILF staff for partnership on events and projects. There were numerous requests for appearances by the Conservation Station and

Lil' Conservation Station. By the end of August 2012, the Conservation Station fleet reached 95 of the 99 counties in Iowa, appearing at 90 events. Because of increased demand from schools and communities for hands-on conservation and natural resource education, ILF is adding a third trailer, with the help of Leopold Center funds. The Conservation Station 3, or CS3, will serve primarily as an outdoor classroom for youth. It will be equipped with audio equipment and photographic microscopes and will transport other activities for field days with students across the state. The CS3 is the home of the Conservation Pack and a new statewide youth initiative, Water Rocks!

ILF's video work also was recognized during the past year. "Out to the Lakes," the final video in the Culture of Conservation series, received three Iowa Motion Picture Association Awards. The film was honored in the categories of documentary, educational production, and original music score at a red carpet-style awards ceremony on May 19. The Culture of Conservation video series, also fueled by Leopold Center funding, currently has more than 4,000 copies in circulation.



## Ecology Initiative keeps an ear to the ground

Ecology Initiative coordinator Jeri Neal summarizes the initiative's focus using "the coffee shop" version — more living roots in the ground and more farmers on the land. "It's a tough challenge," she notes, "to get a handle on the research questions that will help us get ready for a very uncertain future, let alone figure out how to talk about it!" Neal notes that working with multiple-year grants, typical of those funded by the Ecology Initiative, requires even more precision in telling the story.

### New videos on Ecology grants

The most successful recent communications tool for the initiative is "On the Ground with the Leopold Center" initiated in FY2011 ([www.leopold.iastate.edu/news/on-the-ground](http://www.leopold.iastate.edu/news/on-the-ground)). These short videos, 3-7 minutes long, introduce researchers and their students, explain the current progress in their work and explore how their work relates to sustainability. The popular videos have been valuable in helping people understand the research being done in the Initiative. Videos on competitive grants produced this year included: Bird use of prairie strips in row crops, Dordt College/Sioux Center on-farm rotations for water quality, canola production as a possible third crop to diversify cropping systems in Iowa, Whiterock Conservancy conservation and grazing, and livestock mob grazing research.

### Competitive grant explorations

Six new multi-year research projects were launched in FY2012. They complement the 26 active projects already in various stages of implementation. According to Neal, "we are very interested in what's happening in our Iowa soils and how our agricultural practices do and don't contribute to increasing soil organic matter." One of the new projects looks specifically at variability in root traits and predicting changes in soil carbon pools under different cropping systems. The research findings will be used to improve understanding of how to create a sustainable landscape for producing biomass as well as food, fuel and fiber.

Research with more immediate options for on-farm adoption comes from a grant studying winter rye as a cover crop. Adding living cover on the land for more of the year can help Iowa protect and improve the state's soils, but tactics for managing cover crops and commodity crops are not well understood. The project investigators are responding to farmer observations about decreases in corn yield following winter rye cover crops. They will try to determine if the rye is affecting corn seedling pathogens, and this knowledge will help farmers better manage rye cover crops grown in conjunction with corn.

Three of the new grants further the Center's aim to keep livestock on the land. One project, conducted as part of ongoing land conservation-production management work in Iowa's Grand River Grasslands area, seeks to better understand fire/ grazing interactions with management of tall fescue. A second effort builds on a successful Greenhorn Grazing education program to create a higher level of management skills and knowledge through the creation of a Master Grazier certification. This program is focused on farmer adoption and adaptation of improved grazing management practices, building mentoring skills and developing social networks. A third 'keeping livestock on the land' grant explores the greenhouse gas contributions and sequestration that occur as animals graze forages (emphasis is primarily on cool-season pastures in southern Iowa). The investigators hope to begin correlating soil characteristics and greenhouse gas flux for different grazing systems in southern Iowa.

A new research direction for the initiative is an investigation of the complexities of how, why, where and when antibiotic-resistant bacteria move off the farm. The primary concern of farmers and the public is to better understand the implications for water quality arising from production systems for confinement swine and beef grazing. The researchers will study bacterial transport mechanisms and bacterial resistance mechanisms, and the findings are expected to be useful for improving recommendations for in-field and edge-of-field practices that reduce bacterial and nutrient transport.





Patch-burn grazing team: (from left) Shannon Rusk, Lois Wright Morton, Ryan Harr, Diane Debinski, Jim Miller, David Engle



Two significant community events were hosted by the initiative: Ames Reads Leopold (in conjunction with similar celebrations in other communities during the first weekend in March) and Symphony of the Soil, an Iowa premiere showing of Deborah Koons Garcia's documentary film (see p. 13).

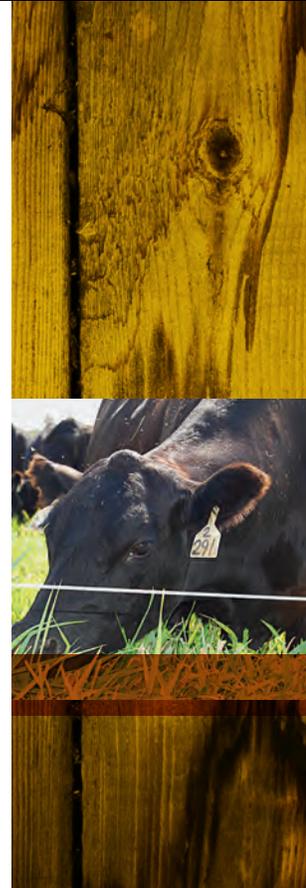
Neal represented the Center on a "Research Development and Knowledge Sharing" work team that drafted recommendations for a policy white paper, "Solutions from the Land." The goal is to describe national-level policy and program building blocks needed for sustainable farms, ranches and forests. Neal also was an author on "The Future of Food and Life: Four Visions Focused on Iowa," published in *The International Journal of Agricultural Sustainability*.

### Collaborating with outside groups

The Ecology Initiative sponsors several working groups and research teams critical in moving research findings to the real world. These groups encourage collaboration, reframe research in a systems context, better leverage Leopold investment dollars, and eventually move findings to farms and communities. The teams and working groups cover topics from agroforestry to cover crops to patch-burn grazing.

The Science-based Trials of Rowcrops Integrated with Prairies (STRIPs) research team gained significant traction this year. The team is investigating the soil, water, yield and biodiversity impacts of strategically integrated strips of prairie within row-cropped agricultural landscapes. The significant gains that can be realized in soil and water management have triggered widespread interest from conservation groups, agencies and farmers and have resulted in identification of Iowa's first on-farm demonstration site. Another working group making good progress in on-farm adoption and practices is the cover crops working group, an Iowa subgroup of the Midwest Cover Crops Council, a larger multi-state working group.

Outside partnerships and grants complement the program activities. The Ecology Initiative is collaborating with the University of Iowa and the USDA National Laboratory for Agriculture and the Environment on a NASA ESPcOR grant, "Agricultural Soil Erosion and Carbon Cycle Observations: Gaps Threaten Climate Mitigation Policies." A new research and education project that focuses on windbreaks and riparian areas was funded through NCR-SARE, "Agroforestry: Evaluation of Bioenergy Feedstock and Carbon Sequestration as Potential Long-Term Revenue Streams to Diversify Landowner Income."



# Marketing and Food Systems Initiative

## Marketing and Food Systems Initiative embraces new model of operations

The Marketing and Food Systems Initiative (MFSI) was directed by interim program leader Craig Chase with support from program assistant Lynn Heuss who came to the Center in October 2011.

Among the key efforts during the year were:

- continuing work on the initiative's competitive grants,
- developing and administrating mini-grants,
- transitioning of the Value Chain Partnerships and the Regional Food Systems Working Group (RFSWG) to independently-run organizations,
- creating a strategy for advancing the Local Food and Farm Initiative, and
- deploying small grant projects to further connect citizens and organizations active in local food systems.

### Value Chain Partnerships (VCP) units evolve

Each of the remaining Value Chain Partnerships groups developed a transition plan that was carried out by the end of December 2011. The Fruit and Vegetable Working Group ended operations when it was determined that its programs and members were very similar to those of a Practical Farmers of Iowa group. The Farm Energy Working Group is led by Carole Yates and continues to be operated by the Center for Energy and Environmental Education at the University of Northern Iowa. The Food Access and Health Work Group will continue to be managed by registered dietitian Angie Tagtow and will be administered through the Iowa Food Systems Council. Pete Lammers, a postdoc research associate in Vet Diagnostic and Animal Medicine, will take the lead on revitalizing the Pork Niche Marketing Working Group as it begins meeting again to reorganize. Continued non-Center funding is in place for the Grass-Based Livestock Working Group, led by Andy Larson, ISU Extension program specialist, and the group is seeking a new administrative home, possibly with the Green Lands, Blue Waters consortium.

### Regional Food Systems Working Group (RFSWG) moves forward

The RFSWG transition is progressing and support was deemed appropriate beyond the original closing deadline of December 2011. The group was awarded a competitive grant from the Leopold Center in January, created a steering committee and operating plan and hired a half-time coordinator. The steering committee also received a small special grant from the Center to help pay the coordinator. The RFSWG continues to meet quarterly and considered adding a 17th region or area in summer 2012 (as outlined in the competitive grant proposal). The working group includes local food groups poised to cover nearly 90 of Iowa's 99 counties.



*Regional Food Systems Working Groups*



David Dahlquist, keynote speaker at local food summit in April.

### Local Food and Farm Initiative (formerly known as the Iowa Local Food and Farm Plan)

The final report for the FY 2011-12 Local Food and Farm Initiative (SF-509) was submitted to the Iowa legislature and the governor in June. In addition to describing the progress made this past year, the report outlined recommendations for future funding for special projects related to food hub development, expansion of farm-to-school and school garden programs, and beginning farmer programs such as farm incubator and mentoring programs. The Iowa legislature approved and Governor Branstad signed a renewal of the Initiative for 2012-13 in May. The funding level remained at \$75,000; of that amount it is expected that \$30,000 will be used to fund projects and the remainder will support staff and food system-related activities.

A local food system summit was held April 3 in Ames with 130 people attending. Participants at the event had an opportunity to help plan the logical next steps for Iowa's local food system development that related to the Initiative's goals. Special projects funded for this fiscal year by the local food initiative were awarded to:

- Prairie Winds RC&D to begin discussions on how farmers in north central Iowa can begin to market produce collaboratively,
- Practical Farmers of Iowa to survey farmers on the barriers to increased fruit and vegetable production,
- Women, Food and Agriculture Network to provide some support for the beginning farmer mentor program, and
- Prairie Rivers of Iowa RC&D to further develop and expand the farm garden program in the Ames Public School District.

### MFSI mini-grants

Several non-competitive mini-grants were funded through the Marketing and Food Systems Initiative. Among them: GPSA graduate student John Dean looked at different approaches to develop a permanent funding mechanism for the Local Food and Farm Initiative; former Center intern Joanna Hamilton developed three publications (an overview of RFSWG local groups, a grower's manual for post-harvest handling procedures, and an overview of state food regulations); horticulture graduate student Kevin Duerfeldt conducted a needs assessment for food hubs in Iowa; and the National Center for Appropriate Technology determined how to initiate a farm-to-school program within the Des Moines Public School District.



### New publications and cool tools from MFSI

Among the publications and cool tools developed through or for the Marketing Initiative:

- local food resource directory for Iowa State University developed by ISU Honors student Ashlee Hesperen,
- research report summarizing vegetable production budgets for high tunnels,
- an overview report looking at the current state of regional food system work by ISU,
- a grower's manual for post-harvest handling procedures, and
- development of a two-page checklist for produce buyers on questions they should ask growers.

# Policy Initiative



Ed Cox, Drake University Agricultural Law Center

The Leopold Center's Policy Initiative conducts 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 initiatives, and does not engage in advocacy or promotion of specific policy alternatives. Mary Adams, Leopold Center outreach and policy coordinator, organized initiative activities this year.

## Land Tenure Policy Working Group

The Land Tenure Policy Working Group, funded by the Policy Initiative, met three times in Des Moines and Ames. The meetings offered opportunities for stakeholders from government agencies, NGOs, private enterprises and university staff members to gather and discuss what their groups were doing in the land tenure arena. Information was shared about surveys that had been done with non-resident landowners and women landowners. The group also talked about their ideas for the Leopold Center Request for Proposals (RFP), and several group members submitted pre-proposals in 2011 and 2012.

## Crop Enterprise Budgets

Mike Duffy, ISU agricultural extension economist, began work on new agricultural enterprise budget sheets covering sod and barley production. These will join the eight earlier publications in the series: raspberries, dairy goats, Christmas trees, popcorn, beekeeping, sheep, sorghum, and sweet corn (see [www.leopold.iastate.edu/policy/resources](http://www.leopold.iastate.edu/policy/resources)).

Duffy and Ed Cox of the Drake University Agricultural Law Center are developing additional questions for the upcoming Iowa land ownership survey to determine the extent of ownership of farmland by trusts and the corresponding impact on the sustainability and resiliency of Iowa's land. Cox is preparing more in-depth questions for a separate survey of land trustees.

## Sustainable Agricultural Land Tenure (SALT) Project

The first phase of the SALT project ended in 2011, and the Policy Initiative then provided modest infrastructure funding for some related activities. The Drake Agricultural Law Center, partnering with the Women, Food, and Agriculture Network (WFAN), conducted video interviews of six women landowners and two farmers which will be edited into additional educational videos. "The Landowner's Guide to Sustainable Farm Leasing"



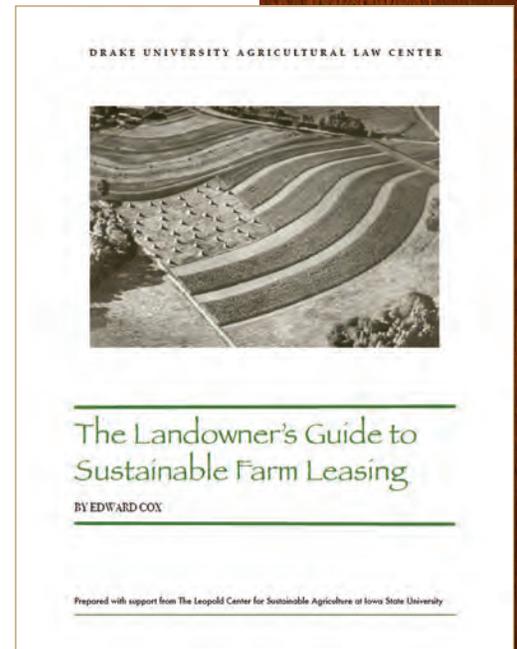
was reprinted and distributed to landowner and farmer organizations. Videos done as part of SALT I are linked on the Leopold Center Policy resources web page at: [www.leopold.iastate.edu/policy/land-tenure-and-land-ethics-videos](http://www.leopold.iastate.edu/policy/land-tenure-and-land-ethics-videos). Two of the films feature former Leopold Center director Jerry DeWitt and former Leopold Center board member Neil Hamilton.

The SALT Initiative continues to provide results in terms of impact from the original project as well as ongoing development of educational resources and outreach partnerships. The principal output of the original project, the Sustainable Farm Lease website ([www.SustainableFarmLease.org](http://www.SustainableFarmLease.org)), has now been visited by more than 12,000 unique users, approximately one-quarter of those from Iowa.

In May 2012 a proposal was submitted by the Allamakee Soil and Water Conservation District to the McKnight Foundation to create a Conservation Lease Expert position to assist landowners and tenants in developing conservation-related leases. The project relies on the information and expertise of Drake Agricultural Law Center staff that is derived directly from the SALT project and fosters practical implementation of SALT resources. Updates have been posted on the [SustainableFarmLease.org](http://SustainableFarmLease.org) website to promote access to new resources, such as the Center's STRIPs (Science-based Trials of Rowcrops Integrated with Prairies) project and the latest Farm and Rural Life Poll.

In response to stakeholder feedback on the SALT project and a desire for more condensed information, the Ag Law Center has published a series of two-page brochures on a variety of topics relevant to sustainable land tenure and decision-making, including "Iowa's Duty of Stewardship," "Principles of Iowa Drainage Law," "Land Contracts for Beginning Farmers," and the "NRCS Hoop House Program on Leased Land." These brochures can be seen on the Leopold Center website at [www.leopold.iastate.edu/pubs](http://www.leopold.iastate.edu/pubs).

The second phase of SALT includes the creation of an online conservation-oriented landowner forum. This forum attempts to replicate the learning circle environment used by many organizations that provide outreach to non-operator landowners. The prototype forum for WFAN has been developed and is now being tested by Drake Law Center and WFAN staff and other agriculture and outreach professionals.



## Cross-Cutting Initiative advances in its second year of operations

Established in 2010, the Center's Cross-Cutting Initiative is steadily gaining momentum in its focal area of enhancing agricultural sustainability through science-based systems research. Under the leadership of coordinator Malcolm Robertson, the initiative supports projects aimed at:

- Assessing agro-systems beyond yield, by incorporating economics, environmental, policy and social aspects in research and outreach programs;
- Increasing the knowledge of mechanisms that regulate processes within farms, fields and communities to optimize management by using a multi-disciplinary research approach; and
- Identifying trade-offs and synergies among various farming options while quantifying the effects that these options have on soil, land, watersheds and communities.

### Collaboration with Practical Farmers of Iowa via their on-farm research program

In 2011 the Cross-Cutting Initiative began three years of funding for the Practical Farmers of Iowa (PFI) Cooperators Program. This program uses research, record-keeping and demonstration projects to provide farmers with readily applicable answers to their questions about a variety of on-farm challenges. The Cooperators' Program was begun by PFI in 1987 with farmers who wanted to save money through more judicious use of inputs.

The project has a strong peer-to-peer component as farmers share their findings with other farmers while looking at ways to improve the design and hypothesis of their demonstrations, or recruit more locations to participate. In FY2012, nearly 80 farmers and cooperators across Iowa were involved in 53 on-farm research and demonstration projects to answer questions about on-farm challenges. The year's research priorities identified by Practical Farmers of Iowa members fell into seven program areas: Field Crops, On-Farm Energy, Grazing, Horticulture, Next Generation, Niche Pork and Poultry.

### Investing in organic agriculture

The Leopold Center has been a strong supporter of the Long-Term Agroecological Research (LTAR) plots since their establishment in 1998 at the ISU Neely-Kinyon Research and Demonstration Farm near Greenfield in Adair County.

LTAR is a randomized, side-by-side comparison of organic and conventional crop production and is frequently heralded as one of the longest running replicated comparisons of this type in the country.

Each year of the LTAR trials yields more information about the effects of producing organic crops over a long period under significant climate and weather variations. Results from these trials suggest that organic systems provide similar yields to conventional systems, along with much higher economic returns while enhancing soil qualities and health.

The project compares and contrasts the following crop rotations using identical crop varieties, each repeated four times in 44 plots:

- Conventional corn-soybean (two-year)
- Organic corn-soybean-oat/alfalfa (three-year)
- Organic corn-soybean-oat/alfalfa-alfalfa (four-year)
- Organic soybean-wheat/red clover (two-year)

### Encouraging and educating the new young farmer base

Local production of fruits and vegetables is a rapidly expanding segment of Iowa agriculture. The ISU College of Agriculture and Life Sciences in 2011 began offering a new undergraduate course, "Horticulture Enterprise Management," in the departments of Agricultural Education and Studies and Horticulture. Cross-Cutting Initiative leader Malcolm Robertson has developed the course focused on educating and training future growers in the management and operation of diversified horticultural enterprises in an Iowa farm situation. Financial management, production and marketing are carried out by students enrolled in the program. The course is



*Horticulture class members. (left to right) Dylan Rolfe, Holden Nyhus, Benjamin Metcalf, and Laura Kleiman*

structured as a business and is guided by decisions made by the students. They investigate the feasibility of a desired enterprise according to the demands of their respective areas before coming together under the direction of the group to make a final decision. Crops are grown at the ISU Horticulture Station north of Ames.

### Course Structure

The on-farm learning process gives students hands-on experience in horticultural enterprise planning (business plan development, budgeting, crop scheduling, record-keeping and marketing) crop production (crop nutrition, crop protection, food safety and post-harvest handling) and practical implementation of the decisions made by the class. Students may enroll in the three-credit course up to three times.

*Spring* – Business planning and early season high tunnel production. Spring session focuses on business planning and crop selection and production according to needs identified from the market research.

*Summer* – Crop production and operations. The summer semester centers on all aspects of production, crop maintenance, record-keeping and operations. Students actively participate in the operation of farm equipment during this period.

*Fall* – Marketing, food safety and late season high tunnel production. The fall semester concentrates on marketing and training and understanding of Good Agricultural Practices (GAPs), which include the new federal standards involving food safety in the fields at harvest and post-harvest. Additionally, students select and grow a crop in the high tunnel to take advantage of an extension of the cropping season.



# Center competitive grants program ranges widely for FY2012

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, multiple reviews and assessment of full proposals submitted in November, and ends with awarding of funds in January.

## // Ecology Initiative

The Ecological Systems Research Initiative funded six proposals received from the Summer 2011 RFP. Fifteen projects received renewals for a second or third year of funding and seven 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 – \$229,548  
Total number of projects – 22

New Ecology grants – FY2012  
Total amount awarded – \$707,543  
Total number of projects – 6

**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.

**Biochar and managed perennial ecosystems: Testing for synergy in ecosystem function and biodiversity, 3 years**  
S. Harpole and L. Biederman, ISU ecology, evolution and organismal biology

Biochar is a major by-product of low-temperature pyrolysis from the thermal decomposition of wood or grasses to produce heat, electricity or biofuels. The goal is to investigate the ecological impacts of biochar on the interactions among native prairie plants, soil organisms and their soil environments. Information will stem from field-based initiatives to determine the effects of these soil amendments prior to widespread application.

**Blurring the lines between working and conservation lands: Bird use of prairie strips in row-cropped watersheds, 2 years**  
L. Schulte-Moore, ISU natural resource ecology and management

The research will quantify how grassland birds respond to the STRIPs (Science-based Trials of Rowcrops Integrated with Prairies) row crop conservation practice, and disseminate research results to knowledge users. This study seeks to expand knowledge about a new conservation practice, the development of strategically integrated prairie strips that improve the health and functioning of the row-crop dominated landscapes found throughout much of Iowa and adjacent states.

**NEW // The complex role of tall fescue in grassland ecology, 3 years**

D. Debinski, ISU ecology, evolution and organismal biology; R. McCulley, University of Kentucky plant and soil sciences; and D. Engle and J. D. Scasta, Oklahoma State University natural resource ecology and management

The effects of grazing and burning management on tallgrass prairie remnants and restorations are explored. Researchers investigate the potential of fire and grazing interaction to reduce tall fescue abundance and/or alter the endophyte infection rates of tall fescue, an exotic grass commonly used as forage for beef cattle and that also shows up as a prairie invasive.



Crop availability of phosphorus in beef manure, 4 years

**A. P. Mallarino, ISU agronomy**

This research attempts to determine 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 plant-available phosphorus in beef manure as a fertilizer can help avoid incorrect application rates.

Enhancing botanical composition, wildlife habitat and carbon sequestration of pastures in south central Iowa through soil disturbance by mob grazing of beef cattle, 3 years

**J. Russell, ISU animal science**

Mob-grazing is ultra-high stock density grazing, a practice where a large concentration of animals is restricted to graze a small area, usually for a very short period of time. This project looks at how mob grazing affects forage type and structure and soil quality over multiple years. The long-term objective of the study is to evaluate the strategic use of mob-grazing on pastures in south central Iowa to improve their botanical composition for forage, as well as wildlife habitat, carbon sequestration and water infiltration.

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

**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 gathered will be used to assess the viability of canola as a crop for Iowa and make cropping recommendations to farmers.

Farmer perspectives on ecosystem service management, land-use targeting and the future of Corn Belt agriculture, 2 years

**J. Tyndall, ISU natural resource ecology and management**

Analysis of the economic, agronomic, social and cultural aspects of farmer decision-making regarding ecosystem service management on their farms specifically, as well as for Iowa as a whole (focusing on water quality and carbon) is the goal for this project. Investigators will attempt to characterize pathways for farmer decision-making regarding ecosystem service management and facilitate the incorporation of these pathways into models for decision support systems.

Getting the most from Iowa's forests: Linking forest understory composition to stream water quality and enhancing nutrient capture in forest remnants in agricultural landscapes, 2 years

**J. Thompson, ISU natural resource ecology and management**

Research for this project will compare soil nutrient content and nutrient and sediment loads in headwater streams located within intact (natural) forests to those in degraded (disturbed) forests. The goal is to identify and disseminate information on practices that enhance riparian forest function in Iowa and the upper Midwest through actions that reduce pollutant inputs to streams and enhance natural ecological processing of nutrients in streams.

Grazing compatibility in and for future years, 5 years, extended

**C. Nelson, Southern Iowa Forage and Livestock Committee**

Research and demonstrations were conducted on wildlife compatibility with grazing and grassland pasture conversion from cool- to warm-season grasses. In-field education occurred with high school and college agriculture students to inform them about rotational grazing management and conservation. Materials are being prepared for farmers and voc-ag instructors.



Grazing prairie: Improving species diversity while maintaining cattle and goat productivity and resting home pastures, 5 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, extended

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.

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

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.

**NEW //** Implementing an ISU Extension Master Grazer Certification course, 3 years

B. Leu, ISU Extension, Fairfield; and M. Drewnoski, ISU animal science

Development of a Master Grazer Certification Program for Iowa State University potentially can increase the animal and environmental performance and economic competitiveness of Iowa's grazing livestock systems. This project builds on the successful Leopold Center-funded "Greenhorn Grazing" program. It will focus on farmer adoption and adaption of practices, building mentoring skills and developing social networks.

Improving soil quality by conserving insect pathogens, 2 years

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 compares 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.

**NEW //** Investigation of bacteria transport and resistance mechanisms and implications for water quality from confinement swine and beef grazing production systems in Iowa, 3 years

M. Soupir, M. Helmets, and R. Kanwar, ISU agricultural and biosystems engineering; M. Thompson and A. Mallarino, ISU agronomy; and L. Jarboe, ISU chemical and biological engineering

This research team will investigate the fate and transport of bacteria from land that receives manure applications. A monitoring study will examine the impact of different agricultural systems on water quality and address emerging issues related to antibiotic resistance in pathogens. In addition, investigators will study the mechanisms of pathogen transport, specifically, if pathogens are attached to manure, soil or sediment particles during transport, and identify related environmental factors.





Dan Jaynes, saturated buffer,  
Bear Creek, Story County, Iowa

Performance of cropping systems designed to reduce nitrate leaching into shallow municipal well aquifers, 5 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 the shallow aquifers that supply water for the city of Sioux Center.

Providing shaded pasture with perennial biomass energy plantings, 3 years, extended

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, extended

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

The investigators are using data from a well-established research site (Bear Creek in Story County) to interpret the influence of perennial vegetation on soil biogeochemical processes. 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.

Reconnecting Iowa riparian buffers with tile drainage, 3 years

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 are testing whether the buffers will allow for the removal of nitrates through the denitrification and sequestration processes, thereby improving water quality in the receiving stream.

Transitioning to ecologically functional production systems, 3 years

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.

**NEW //** Understanding soil organic matter change: Modeling root and soil interactions across agricultural landscapes, 2 years

C. Cambardella, USDA-ARS National Laboratory for Agriculture and the Environment; T. Ontl and L. Schulte-Moore, ISU natural resource ecology and management; and R. Kolka, USDA Forest Service-Northern Research Station

The research team aims to quantify spatial variability in root traits associated with three cropping systems (continuous corn, triticale/sorghum and perennial switchgrass), and predict changes in soil carbon pools by modeling the interactions among roots and soil characteristics. Investigators plan to use the knowledge to devise farming strategies that keep living roots in the ground and contribute to increased soil organic matter, increased carbon sequestration and reduced erosion. The project is part of the larger Landscape Biomass Project which focuses on the development of environmentally and economically viable biomass cropping systems.



**NEW //** Use of grazing management to mitigate greenhouse gas emissions while increasing soil organic matter and water-holding capacity of cool season pastures in southern Iowa, 3 years

J. Russell, ISU animal science; W. Powers, Michigan State University; and T. Isenhardt, ISU natural resource ecology and management

The investigator's long-term goal is to quantify the effects of grazing management on the flux of major greenhouse gases, and assess the relationships among greenhouse gases, soil organic carbon sequestration, botanical and chemical composition of vegetation, and physical characteristics of soil in southern Iowa grasslands. The grazing systems compared are continuous stocking, rotational stocking and mob-stocking, with the intermediate goal of demonstrating that proper grazing management can improve cow performance while providing ecological services.

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

J. Russell, ISU animal science

The investigator seeks to identify the grazing system that best optimizes the performance of grazing animals, forage and the chemical and soil quality 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.

What drives corn yield stability in the context of climate variability? 2 years

M. Castellano, ISU Agronomy

Can corn genotype affect the soil rooting environment (also known as the rhizosphere) to modulate yield amount and yield stability? Investigators will examine the ability of rhizosphere properties to promote agroecosystem (crop and soil) resilience. They seek to identify causal relationships between genotype-controls on rhizosphere properties and yield amount, yield stability and soil quality.

**NEW //** Winter rye cover crop effect on corn seedling pathogens, 3 years

T. Kaspar and T. Moorman, USDA-ARS National Laboratory for Agriculture and the Environment

While cover crops are an excellent management tool for sustainable agriculture, decreases in corn yield have been observed following winter rye cover crops. This project tests the hypothesis that glyphosate-killed rye cover crops are hosts for corn seedling pathogens. There will be studies in a controlled environment and on-farm field studies, as well as testing of management strategies to prevent or minimize corn yield decreases.

## // Marketing and Food Systems Initiative

The Marketing and Food Systems Initiative funded eight pre-proposals received from the Summer 2011 RFP. Three projects were renewed for a second year of funding and four were given extensions to complete their work or were slated to end.

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

Total amount awarded – \$54,614

Total number of projects – 3

New Marketing Initiative grants – FY2012

Total amount awarded – \$258,104

Total number of projects – 8

**NEW //** Convening the Regional Food Systems Working Group (RFSWG), 2 years

A. Geary, University of Northern Iowa; D. Dettman, K. Enshayan, J. Grimm, M. Houser, L. Kuennen, J. Libbey, B. Ranum and T. Wiemerslage, RFSWG Steering Committee

This grant supports the continued convening of the RFSWG, including support for quarterly meetings and the development of new leadership to guide and facilitate the group. Group members will continue to encourage food and agriculture producers, businesses and state and federal organizations to network, share information and tools and collectively address challenges.

Developing and implementing a strategic plan for farm-to-school programs in northeast Iowa, 2 years, extended  
**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 graders 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 work was begun on school garden projects with the help of Master Gardeners.

Developing permaculture techniques for increased production and profit in sustainable year-round agriculture for beginning farmers and ranchers in southwest Iowa, 2 years

**B. Deuel and B. Barry, Golden Hills Resource Conservation and Development (RC&D), Oakland**

This project, coordinated by the Southwest Iowa Food and Farming Initiative, seeks to 1) design and implement a year-round pilot project to demonstrate year-round growing techniques in high-tunnels that includes composting and vermi-composting techniques; 2) establish a formal growers association in the southwest part of the state; and 3) recruit and mentor at least four new growers in Pottawattamie County to build the local food system.

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

**P. O'Malley, ISU Extension, Johnson County**

With several different modifications to the pulper, researchers were able to optimize the pulper for mechanically processing pawpaws at an ISU food science lab. Pawpaw fruits from year 2 were sorted according to ripeness. The ripe fruits were processed to obtain pulp in the pilot plant using the same modified equipment and method as last year's successful run. This provided crop year effects, as well as a replication of the process.

**NEW //** Establishing shared-use processing facilities at three possible locations in central and south central Iowa, 1 year

**J. Porter, Neighborhood Investment Corporation, and G. Huber, Iowa Food Cooperative**

The nonprofit Neighborhood Investment Corporation has been working with the Iowa Food Cooperative to develop a shared-use processing facility in the unused kitchen at the Robert W. Mickle Neighborhood Resource Center in Des Moines. The kitchen is a potential location for the development of new food-related small business enterprises. In addition to the Mickle Center, two additional sites will be analyzed as potential locations; a former bakery in the Valley Junction historical district of West Des Moines and an existing kitchen in Chariton, Iowa.

**NEW //** Field evaluation and system improvement of a semi-automated mechanical intra-row weeder for vegetable crops, 1 year

**L. Tang, ISU agricultural and biosystems engineering, and K. Delate, ISU horticulture and agronomy**

Here is an expansion of a previous Leopold Center competitive grant (M2009-23), which supported the development of a basic semi-automated mechanical intra-row weed removal system for vegetable crops. The investigators will conduct field trials to evaluate and improve the prototype.

**NEW //** Improving profitability for small and very small meat processors in Iowa, 2 years

**N. McCann, ISU Extension, Winneshiek County**

Funding for this grant supports the development of a productivity curriculum for small meat processors in Iowa, as well as quarterly one-day classes and one-on-one follow-up services. The curriculum will focus on scheduling, product mix decisions, retail inventory management, and shop floor performance measurement. The project builds on earlier efforts of the Leopold Center's Small Meat Processors Working Group.



*School garden, Kate Mitchell  
Elementary School (Ames, Iowa)*





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

**A. Geary, Northern Iowa Food and Farm Partnership**

The investigator organized a workshop on “Growing Local Lunches,” aimed at local farmers interested in selling to schools or otherwise being more involved in farm to school programming. In consultation with Waverly-Shell Rock schools and Genuine Faux Farm, they revised ISU Extension’s “Checklist for Retail Purchasing of Local Produce” to target schools’ specific needs, and are in the process of becoming a clearinghouse for these forms. They held an event to bring together local growers who are interested in selling to institutions, and area businesses that are interested in buying more locally grown food.

Involving new immigrants and minorities in local food systems, 1 year, extended

**J. Flora and C. Flora, ISU rural sociology**

Investigators hope to increase participation among immigrants and members of other minority populations in development of local food systems in Iowa. They will develop curricula for participatory research to be conducted by youth and for training sessions, and a website of resources for minority farmers, processors and distributors, retailers and consumers in each region.

Local food in every pot: Growing farmers in northeastern Iowa through public and private partnerships, 2 years, extended

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

This project, coordinated by the Northern Iowa Food and Farm Partnership, will help facilitate more growers entering the local food marketplace by providing access to county-owned land, production and marketing technical assistance, and business skills development. Target groups for the program are women, minorities, and new and transitioning farmers.

**NEW // Machinery management for small- and medium-sized horticultural farms, 2 years**  
**G. Artz and W. Edwards, ISU economics, and D. Jarboe, ISU Center for Crops Utilization Research and BioCentury Research Farm**

The investigators will design and implement a survey of Iowa fruit and vegetable growers and develop a set of case study interviews with growers who have expanded their operations. The knowledge gained will be used to develop a user-friendly decision tool and educational materials to help growers who face a variety of machinery-related challenges.

**NEW // Micro-farming: Reducing rural and urban food deserts through job training, 1 year**

**M. Mancuso, Iowa Western Community College**

The project leader is developing an innovative 42-hour continuing education course at Iowa Western Community College in Council Bluffs to train a new generation of farmers and increase the amount of fresh, healthy and affordable food available in southwest Iowa’s regional food deserts. The course will cover business and financial planning, land acquisition, equipment selection and maintenance, crop/animal selection, water and soil quality, and marketing and promotion.

**NEW // Procurement tools to develop sustainable local food purchasing models for farm to school chapters, 2 years**

**J. Grimm, Iowa Valley Resource Conservation and Development RC&D, Amana**

The Iowa Corridor Food and Agriculture Coalition will hire a two-year local food procurement coordinator to assist schools in purchasing from local growers. The project seeks to develop templates and procedures for tools that will make local food procurement for school meals and snacks less reliant on outside technical assistance and funding, and will result in an Iowa-based online toolkit.

**Research and development of an online local foods buying club cooperative, 2 years**

**C. Elwood-Gehrke and J. Grimm, Iowa Valley Resource Conservation and Development RC&D, Amana, and J. Singerman, Prairie Ventures L.L.C.**

The project seeks to develop the Iowa Valley Food Cooperative (IVFC), a web-based, direct to consumer, marketplace for food, fiber and other producers in eastern Iowa. A case study of the cooperative will be developed so that it can be replicated elsewhere and linked with other cooperatives such as the Iowa Food Cooperative in Des Moines.



**NEW //** Transitioning farmers to produce for wholesale markets, 2 years

**J. Cross, GROWN Locally, Decorah**

The principal investigator will work with producers in northeast Iowa on Good Agriculture Practices (GAP) assessments and safety plans, coordinate the creation of marketing materials, seek out new producers and help existing producers expand, coordinate a peer mentor program, and set up a training workshop for good handling practices and post-harvest handling procedures. Project findings will help GROWN Locally meet increased demands for products.

**Transplant production decision tool for vegetable producers, 2 years**

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

Two tools will be developed for financial analysis of transplant production options: a budget template for transplant production to be used in comparing production options and farm-based production to the cost of purchased transplants; and a discussion of cost-benefit analyses for various operational improvements. The latter will include a narrative discussion of risk mitigation and quality-of-life considerations.

## // Policy Initiative

The Policy Research Initiative funded three proposals received from the Summer 2011 RFP. One project was given an extension to complete final reporting.

**Policy Initiative existing grants**

Total amount awarded – \$0

Total number of projects – one no cost-extension

**New Policy Initiative grants – FY2012**

Total amount awarded – \$105,350

Total number of projects – 3

**NEW //** The extent and impact of trust ownership on the sustainability and resiliency of Iowa's agricultural landscape, 2 years

**E. Cox, Drake University Agricultural Law Center, Des Moines; and M. Duffy, ISU economics**

First, survey questions will be added to the existing ISU Farmland Ownership Survey to increase knowledge about the extent and nature of land trusts in Iowa. A second survey of the Iowa Trust Association will determine whether public policies are affecting the expansion of land ownership in trusts. The investigators also will conduct research to illuminate how trusts impact sustainable land management and the resilience of the agricultural system.

**NEW //** Investigating opportunities for enhancing farmer adoption of strategically targeted prairie strips in Iowa, 1 year

**J. G. Arbuckle, ISU sociology, J. Tyndall and D. Larsen, ISU natural resource ecology and management**

This planning grant looks at ways to transfer scientific knowledge gained from the STRIPs (Science-based Trials of Rowcrops Integrated with Prairies) project at the Neal Smith National Wildlife Refuge. The investigators will interview project stakeholders and identify potential ways for establishing a network of demonstration sites, with the goal of identifying practical steps needed to gain widespread support for incorporating targeted prairie strips into the Iowa landscape.

**NEW //** Sustainable Agricultural Land Tenure (SALT) Initiative II, 1 year

**E. Cox, Drake University Agricultural Law Center, Des Moines**

This project builds on the SALT Initiative (2009-2011), focusing on critical land tenure policy issues. The objectives are to tailor outreach efforts to landowners with the highest potential impact on sustainability and resilience, enable landowners to be confident in the lease negotiation process and be able to monitor compliance with sustainable lease provisions, and understand how public conservation agencies utilize land tenure trends and documents.



## // Cross-Cutting Initiative

The Cross-Cutting Initiative funded four proposals received from the Summer 2011 RFP. Another eight projects were renewed for a second or third year of funding or given extensions to complete their work.

Cross-Cutting Initiative existing grants – Renewals were given to four projects for a second year of funding.

Total amount awarded – \$175,358

Total number of projects – 8

New Cross-Cutting Initiative grants – FY2012

Total amount awarded – \$99,117

Total number of projects – 4

**NEW // Attracting pollinators and natural enemies to add value to Iowa agriculture, 3 years**

M. O'Neal and D. Lewis, ISU entomology; M. Gleason, ISU plant pathology and microbiology; C. Haynes, ISU horticulture and agriculture education; A. Joseph, Iowa Department of Agriculture and Land Stewardship; and M. Duffy, ISU economics

The investigators will develop an outreach program to show Iowa stakeholders how they can increase the ecosystem services of wild pollinators and natural pest enemies. They will implement a paired-comparison experiment on five ISU farms throughout the state to test the hypothesis that adding a refuge of perennial plants attractive to beneficial insects will improve the delivery of ecosystems services to soybean and melon production. They will calculate a partial budget to isolate the effects of the beneficial insects-enhancement treatment on the value of the marketable harvest of muskmelon and soybean.

**Building social networks to capture synergies in wood-based energy production and invasive pest mitigation, 2 years**

J. Randall and J. Tyndall, ISU natural resource ecology and management

This project seeks to develop comprehensive strategies for addressing the high costs associated with managing the spread of emerald ash borer in Iowa. The project will build effective partnerships and business networks to support sustainable land management activities and economic opportunities that capture value in low-quality woody material, and specifically emerald ash borer-infested wood. Investigators also will design, deliver and evaluate a collaborative tool while leading the development of the "action" component of Iowa's Emerald Ash Borer Readiness Plan.

**NEW // Demonstrating farrowing alternatives for small farms: Insulated tents for sows and pigs, 3 years**  
J. Harmon, ISU agricultural and biosystems engineering

The work of the ISU Hoop Group continues with this demonstration of a circular, insulated tent, or yurt, for farrowing pigs in a bedded, crate-free environment, and by developing a management guide for farmers regarding managing sows and pigs in bedded, crate-free systems. The demonstration yurt will be erected at ISU's Allee Demonstration Farm near Newell and operated for farrowing pigs.

**Drainage water quality impacts of current and future agricultural management practices, 1 year**

M. Helmers and R. Kanwar, ISU agricultural and biosystems engineering; and A. Mallarino, ISU agronomy

The researchers will continue data collection from a previously funded project for one more year to account for additional variability in weather. This is a systems-level study where the overall objectives are to evaluate the drainage water quality impacts of various cropping and nutrient management systems and it includes these comparisons: cropping practices through the use of a winter cover crop, use of swine manure before corn and soybeans or just corn, continuous corn systems with and without stover removal compared to a corn-soybean system, and use of a no-till corn-soybean system.

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

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.

**NEW // Farm metered energy analyses: Getting baseline data, ground-truthing changes, 2 years**

T. Opheim, Practical Farmers of Iowa

Practical Farmers of Iowa will prepare metered energy analyses for 25 farms. The investigators will gather and analyze five years of the farms' metered energy use (both before and after the farmers have taken steps to enhance energy efficiency and renewable energy), and develop reports on the farmers' energy use, costs, and carbon dioxide emissions. Results will be shared via workshops, field days and media outlets.

Grass-Based Livestock Working Group, 3 years, extended

A. Larson, ISU Extension

The group met 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 provided 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.

Increasing Iowa farmers' resiliency through the Practical Farmers of Iowa (PFI) cooperators' program, 3 years

T. Opheim, Practical Farmers of Iowa

This project is focused on supporting the PFI Cooperators' Program, through which Iowa farmers in conjunction with PFI staff and academic researchers investigate farmers' most pressing on-farm research and demonstration questions. Farmers set their research and demonstration priorities, and PFI staff help them follow up on investigating those priorities through a variety of research, demonstration, and record-keeping projects.

Iowa Farm Energy Working Group, 2 years

C. Yates and K. Enshayan, UNI Center for Energy and Environmental Education

This project supports a statewide Farm Energy Working Group that will encourage implementation of a variety of energy conservation, efficiency and renewable energy practices for small and midsize farms in Iowa. The group meets quarterly and offers mini-grants for research, education and on-farm case studies.

The Long-Term Agro-ecological Research (LTAR)

Experiment: Ecological benefits of organic crop rotations in terms of crop yields, soil quality, economic performance and potential global climate change mitigation, 3 years

K. Delate, ISU agronomy and horticulture; C. Cambardella, USDA-ARS National Laboratory for Agriculture and the Environment; and C. Chase, ISU Extension

The Long-Term Agro-ecological Research (LTAR) Experiment was established in 1998 at the ISU Neely-Kinyon Farm in Greenfield to compare conventional and organic cropping systems. The proposed research evaluates alternatives to the traditional corn-soybean rotation in Iowa, and investigates production processes based on agroecological principles, designed to reduce off-farm energy demand and to increase the internal resilience of agroecosystems, which consequently increases their adaptability to potential climate changes.

Meeting on-farm energy needs through conservation,

efficiency and renewable energy, 2 years, ending 2012

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.

**NEW //** The University of Iowa Biomass Partnership Project, 1 year

F. Milster, Facilities Management, University of Iowa; J. Tyndall, J. Randall and R. Hall, Iowa State University; R. Zalesny, Jr., G. Domke and M. Nelson, USDA Forest Service-Northern Research Station; N. Young, Iowa Flood Center; and D. Smith, Tallgrass Prairie Center and University of Northern Iowa biology

A unique Biomass Partnership Project (BPP) to plan and develop a large supply of biorenewable fuel is being funded by this project. The fuel will replace coal at the University of Iowa Main Power Plant, while simultaneously improving environmental performance of Iowa lands and resources and stimulating the local rural economy. The project objectives are to develop a plan to increase energy sustainability at UI, develop a biorenewable fuel financial and procurement work plan, and produce, disseminate and share processes and plans useful as a model to others.





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