



LEOPOLD CENTER
FOR SUSTAINABLE AGRICULTURE

ANNUAL REPORT | 2012-2013

“When we
see land as a
community to
which we belong,
we may begin
to use it with love
and respect.”

- Aldo Leopold



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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.

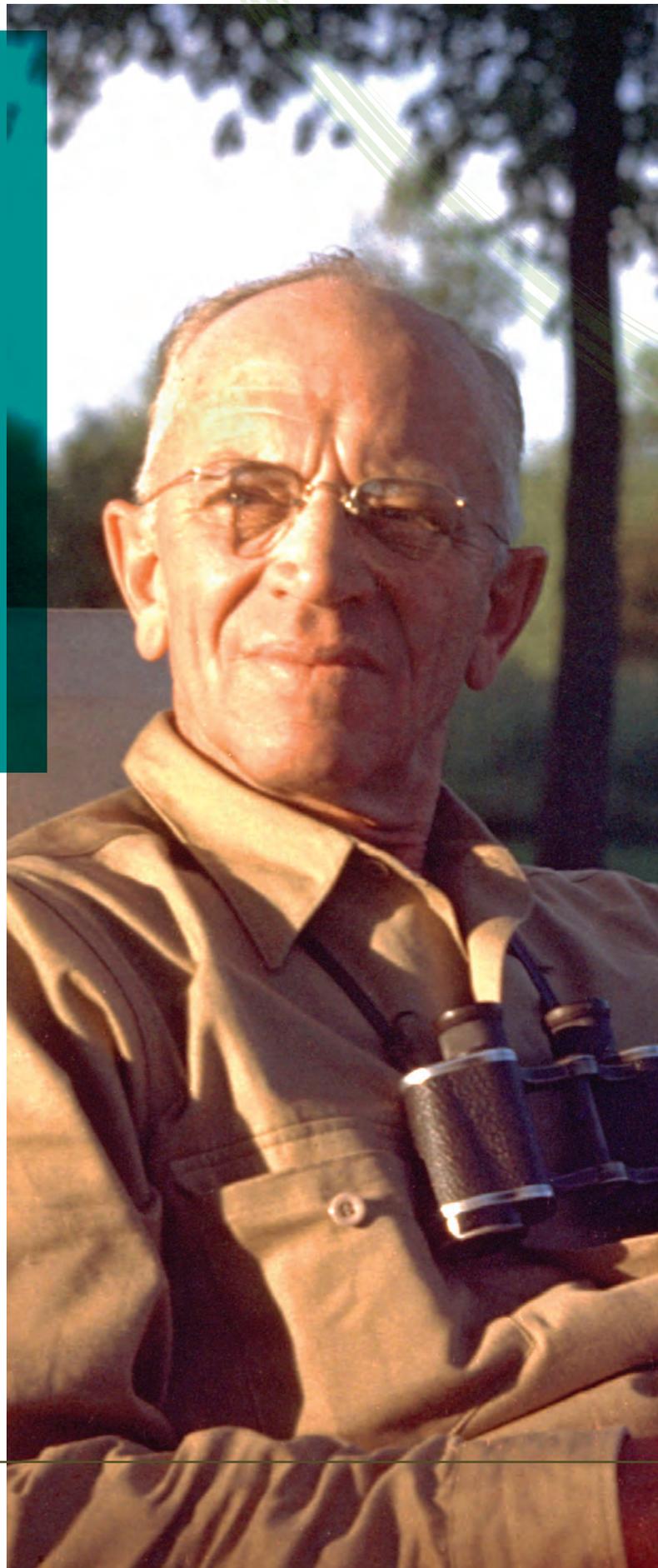
Vision: The Leopold Center for Sustainable Agriculture explores and cultivates alternatives that secure healthier people and landscapes in Iowa and the nation.

Photos by Leopold Center staff except where noted.

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
Design by julsdesign inc., Ankeny, Iowa

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*“Two roads diverged in a wood,
and I – I took the one less traveled by,
And, that has made all the difference.”*

Robert Frost, The Road Not Taken

For more than 25 years, the Leopold Center for Sustainable Agriculture has taken that famous road “less traveled by.” As it was originally charged to do in the Iowa Groundwater Protection Act of 1987, the Center has “conducted and sponsored research to identify and reduce negative environmental and socioeconomic impacts of agricultural practices; and researched and assisted in developing emerging alternative practices that are consistent with a sustainable agriculture.” Nearly \$20M dollars has been devoted to more than 500 projects during that time. The research program has evolved from issue teams to omnibus grants to research initiatives to research subject portals. Board members, directors and staff members have come and gone, but the standing orders and the Leopold ethic to honor the land remain paramount to the Center’s operations and activities.

What outcomes can the Center point to after two-and-a-half decades of passionate efforts to make Iowa’s agricultural landscape more resilient? There are some obvious successes: riparian buffer

strips established on Bear Creek north of Ames; the first livestock hoop house experiments in Iowa; strong, sustained support of ISU’s organic crop production program; the foundation and flowering of Iowa’s thriving local food systems; pioneering work on the value of crop rotations and cover crops as environmental assets; high tunnel growing structures as a way to extend vegetable production; bioreactors as water quality tools; the list goes on and on. The Center’s evaluation expert and her assistant are tabulating and analyzing the community and statewide impacts of some of these results (see page 9) and sharing them with the Center’s friends and detractors to show what has been accomplished.

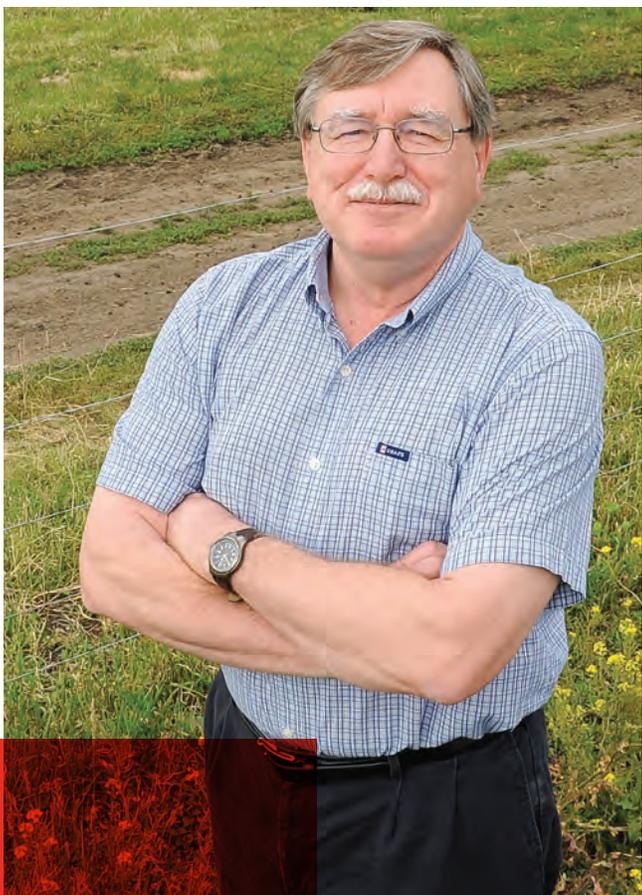
Despite the wealth of knowledge and practices that exist, thanks to the concerted efforts of the Leopold Center and its compatriots, there are formidable challenges that remain for Iowa agriculture. Water quality continues to be a far-reaching concern for rural and urban Iowans and the search for solutions is yielding no quick and easy answers. Climate change looms as a huge

unknown factor, and farmers will be among the groups most seriously affected by long-term, weather-fueled alterations in growing conditions. Soil loss and the health of the remaining soil require immediate public attention and action. (New England farmer/poet Robert Frost wrote, “Nature is always hinting at us. It hints over and over again. And suddenly we take the hint.”)

The challenge is not to be overwhelmed by the many things that need to be done to help Iowa farmers and instead to keep working on the things we can do to make a difference. This is the firm and lasting commitment that the Leopold Center makes to its many stakeholders, partners, collaborators, investigators and supporters: That we stand ready to work with them and beside them to achieve a more sustainable, ecologically and economically vibrant agriculture that will benefit Iowans today and in the future. Frost said it best, “...I have promises to keep, And miles to go before I sleep, And miles to go before I sleep.”

Mary Adams, *Editor*

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



DIRECTOR'S MESSAGE

As we begin another year at the Leopold Center, I look back on all of the changes that have occurred since I became Director. In addition to saying thanks to Mark Honeyman for a job well done as interim Director, we bid farewell to several advisory board members who have moved on to other challenges. We also said goodbye to the Center's accountant, Karen Jacobsen, and wished her well in retirement.

But while some have left, we also have welcomed new advisory board members as well as new staff members. These additions bring new perspectives and skills to the Center and help keep it vibrant and adaptable to change.

I have continued to travel around the state to familiarize myself with Iowans and the land. Once again this year, we have been confronted with erratic weather and an uncertain cropping season. Heavy rains caused large amounts of soil erosion, delayed planting and led to excessive runoff and water quality problems. Iowans are very familiar with these kinds of weather impacts and, in all likelihood we will be faced with more weather uncertainty in the future. Therefore, the Leopold Center will continue to work with others to identify specific problems and solutions that work for Iowa. The Center will continue to support research related to agriculture, farming and food. This is what we do best. The Center has a long history of agricultural achievements that I am dedicated to carrying on into the future.

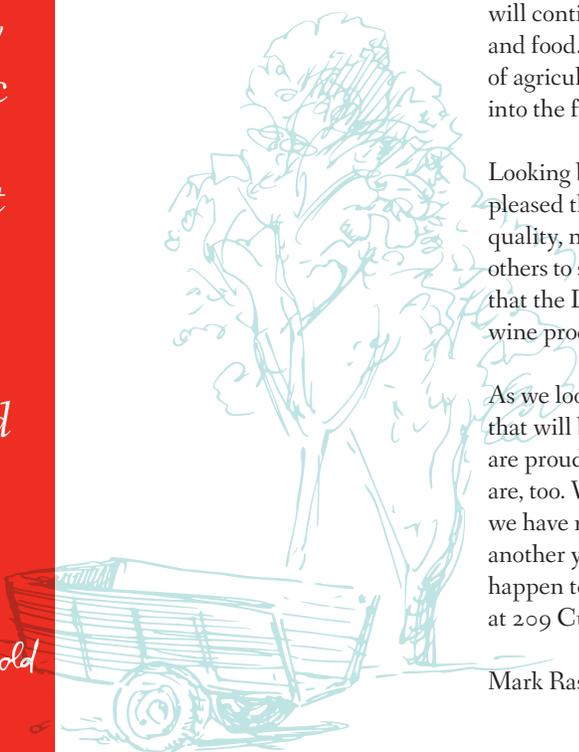
Looking back on the Center's 26 years of accomplishments, we are pleased that the research investments previously made in water quality, nutrient management and soil quality have been used by others to solve problems and improve life in Iowa. We are glad to see that the Leopold Center's significant early investment in grape and wine production has allowed that industry to expand.

As we look forward to the future, we are working on projects today that will be beneficial to the next generation of Iowa citizens. We are proud of the Center and its accomplishments and we know you are, too. We are thankful for the support and encouragement that we have received from many Iowans. So, as we move forward into another year, please stay in touch and let us hear from you. If you happen to be in Ames, stop by Curtiss Hall and say hello. The door at 209 Curtiss is always open.

Mark Rasmussen, *Director*

“That land is a community is the basic concept of ecology, but that land is to be loved and respected is an extension of ethics.”

- Aldo Leopold





From Left to Right: Heather Scott, Craig Chase, Lynn Heuss, Laura Kleiman, Arlene Enderton

CENTER WELCOMES NEW STAFF MEMBERS

The usually stable roster of Leopold Center employees received an infusion of new talent in FY2013. One of the new staffers filled a long-standing position and the other three newbies will be working primarily with the expanded and thriving food systems program. Two other staffers received promotions that acknowledged their added responsibilities and contributions to the Center's mission.

Karen Jacobson, who had served as the Center's administrative specialist since 2004, retired in August 2012. Her replacement, Heather Scott, started work for the Center in April 2013 and is in charge of the Center's financial recordkeeping and accounting. Scott is a half-time Leopold Center employee and spends her remaining time on campus working at the Iowa Pork Industry Center.

Craig Chase coordinates the Center's Marketing and Food Systems Initiative, as well as the Iowa Food Systems Working Group under ISU Extension and Outreach and the Local Food and Farm Initiative, a legislative creation since 2011. He needed some help to complete all tasks related to these three programs, so Lynn Heuss joined him as a part-time Program Assistant in July 2012. Laura Kleiman was hired as a Research

Associate in May 2013. In addition, Chase was promoted to Program Manager in late June 2013.

Corry Bregendahl's new role as an Associate Scientist includes expanded capacity for carrying out the Center's program evaluation functions and the responsibility of managing additional outside grant work. To assist her, Arlene Enderton was hired as a Program Assistant in May 2013.

A MESSAGE FROM THE ADVISORY BOARD CHAIR

I have long been a fan of the Leopold Center for Sustainable Agriculture. As a full-time farmer from the mid-70s to the mid-90s, I looked to the Center for management alternatives that could help me improve my beef and crop enterprises. Those were not easy times in agriculture, so any advantage I could glean from the Center and others was valuable information. It was with great excitement that I found myself as chair of the Advisory Board this past year. As a board member it has been my opportunity to give back to the institution that provided me so much in my previous life.

It has been an exciting year at the Leopold Center. Most importantly, we welcomed our new director, Dr. Mark Rasmussen. The fact that he began his distinguished career as a full-time farmer in Nebraska has not been lost on me. That background provides him with the credentials as well as the common sense to meet agricultural producers with an understanding of their needs, thus allowing him to translate those needs to potential Center researchers.

With a new director and a number of new board members, the time was right for the advisory board to rethink the strategic initiatives that will guide the Center over the next number of years. As General Eisenhower once stated, "plans are useless, but planning is indispensable." Of course, we have a plan on paper that will guide us into the next several years, but something more important

happened: As board members from varied backgrounds, we had the opportunity to interact with each other and our new director. We exchanged our visions for what is needed generally in agriculture and specifically at the Center. The exchanges that took place ranged from a vision for land-use to communication with producers and everything in between.

As we move forward in the coming years, we need to maximize the impact of Leopold Center's research on Iowa agriculture:

- ~ We must focus on initiatives that we believe can be delivered at a scale that will have an impact,
- ~ We must promote the good work that has been done in the past, and
- ~ We must communicate and collaborate with a wide variety of partners and audiences.

The Leopold Center enjoys a strong reputation. We must leverage that reputation by working with a wide variety of partners to extend our reach and fulfill the mandate of the legislation that created us, to "maintain economic and social viability while preserving the high productivity and quality of Iowa's land."

Bill Ehm, *Leopold Center Advisory Board Chair, 2012-13*



2012-2013 LEOPOLD CENTER STAFF

Mark Rasmussen, Director
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Frederick Kirschenmann, Distinguished Fellow*
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Craig Chase, Marketing & Food Systems Program Manager*
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Arlene Enderton, Program Assistant* **
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Lynn Heuss, Program Assistant*
leheuss@iastate.edu

Karen Jacobson, Administrative Specialist** (through August 10)

Laura Kleiman, Research Associate* **
lkleiman@iastate.edu

Blue Maas, Secretary
bluemaas@iastate.edu

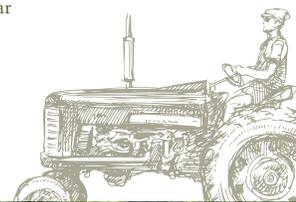
Laura Miller, Communications Specialist
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Jeri Neal, Ecological Systems & Research Program Coordinator
wink@iastate.edu

Malcolm Robertson, Cross-Cutting Initiative Coordination & Outreach*
malcolmr@iastate.edu

Heather Scott, Administrative Specialist* **
hscott@iastate.edu

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



2012-2013 LEOPOLD CENTER ADVISORY BOARD



Advisory Board

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

Dennis Dahms, Professor of Geography, University of Northern Iowa*

Bill Ehm, Director, Environmental Services Division, Iowa Department of Natural Resources (Chair)

Kamyar Enshayan, Director, Center for Energy and Environmental Education, University of Northern Iowa*

Dale Farnham, State Soil Conservation Committee, Ames*

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*

Jay Johnson, Deputy Director, Iowa Department of Agriculture and Land Stewardship*

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

Steve Mickelson, Professor of Agricultural and Biosystems Engineering, Iowa State University*

John Olthoff, Professor of Agriculture, Dordt College, Sioux Center

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

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

FINANCES FOR YEARS ENDED JUNE 30, 2013 & 2012

	2013	2012
Funds Received		
State AMA Receipts	\$1,291,419	\$1,639,734
ISU Allocations	430,927	426,270
Foundation Funds	191,749	175,824
Staff Leveraged External Grants and Projects	100,717	103,249
Incentive/Discretionary Accounts	610	506
Total Funds Received	2,015,422	2,345,583
Funds Expended		
Personnel	752,706	737,936
Operations	137,086	161,957
Competitive Grants and Grant Infrastructure:		
Ecology Initiative	592,888	790,866
Policy Initiative	67,592	76,428
Marketing Initiative	229,907	337,186
Cross-Cutting Initiative	296,638	290,447
Monthly Competitive Education Program	7,942	9,082
Total Competitive Grants and Grant Infrastructure	1,194,967	1,504,009
Foundation Accounts	328,541	171,083
Staff Leveraged External Grants and Projects	140,886	138,310
Total Funds Expended	2,554,186	2,713,295
Increase/(Decrease) in Funds	(538,764)	(367,712)
Funds, Beginning of Year	2,099,629	2,467,341
Funds, End of Year	\$1,560,865	\$2,099,629
Competitive Grants AWARDED by Initiative		
Ecology	\$126,660	\$640,389
Policy	62,955	105,350
Marketing	121,224	237,104
Cross-Cutting (XP)	98,396	197,447
Total	\$409,235	\$1,180,290

The format of the financial statements in this annual report reflects the on-going efforts for more transparency begun in prior years. 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 amount awarded).

LEOPOLD CENTER BY THE NUMBERS

Programs	FY2010	FY2011	FY2012	FY2013
Active Grants	96	89	71	81
New Grants	44	33	31	40
Number of Pre-proposals	54	54	74	54
Active Working Groups	9	10	13	10
Iowa Counties with Active Projects	52	58	49	47
Principal Investigators	74	67	57	64
Outreach				
Publications (Papers, Books, Etc.)	15	25	59	73
Website Unique Visitors (Monthly Average)	16,936	16,388	6,452*	6,483
Website Activity (Monthly Average)	75,857	80,873	19,800**	18,773
Educational Events	39	179	163	164
Reported Leveraged Funds by LC Projects	\$142,000	\$1.817M	\$1.820M	\$5.181M
Center Stats				
Employees	12	10	10	13
Interns/Students	15	10	4	4

*New website launched September 2011 with different web tracking system.

**Includes only average monthly page views for nine months under different tracking system.

“That the situation appears hopeless should not prevent us from doing our best.”

- Aldo Leopold

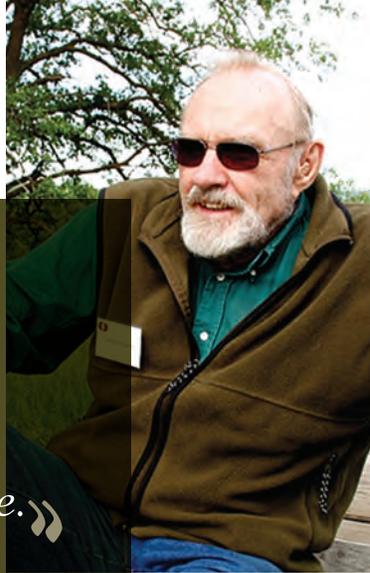
Jennifer Steffen, Farmer,
District Soil and Water
Commission, Birmingham

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*

* served part of the year

Fred Kirschenmann



“A thing is right when it tends to preserve the integrity, stability and beauty of the biotic community. It is wrong when it tends otherwise.”

- Aldo Leopold

KIRSCHENMANN SPEECHES OPEN TWO REGIONAL SARE CONFERENCES IN 2012-2013

Fred Kirschenmann, Distinguished Fellow at the Leopold Center, maintains a robust schedule of writing, public appearances and speeches, and active participation in a variety of national sustainable agriculture boards and organizations. He divides his time between the Leopold Center and the Stone Barns Center of Food and Agriculture in Pocantico Hills, New York, where he continues to serve as the President of the Board.

Kirschenmann gave 24 keynote speeches at various locations in the United States and Canada between July 1, 2012 and June 30, 2013. He offered the opening addresses at both the Western and Southern Sustainable Agriculture Research and Education (SARE) program conferences.

Notably, he spoke on “Agriculture of the Middle: A Development Model” at a

conference held in Wicklow, Ireland on August 31, 2012. The conference theme was Rural Cooperation in the 21st Century: Unique Opportunities for “Farm Families,” one of the topics he is frequently asked to discuss.

Kirschenmann was an active figure on the Iowa sustainable agriculture speaking circuit, with presentations at the:

- ~ Interfaith Power and Light conference,
- ~ Wallace Family Future of Agriculture convening,
- ~ Iowa Organic Conference,
- ~ Raccoon River Watershed Association conference, and
- ~ Des Moines Franklin Public Library Platinum LEED celebration.

He also made presentations and/or keynote speeches at locations outside of Iowa, including the:

- ~ Luther Seminary Annual Rutlen Faith and Creation Lecture (St. Paul, Minnesota),
- ~ University of Florida,
- ~ University of Kansas,
- ~ North Dakota State University,
- ~ Virginia Polytechnic Institute and State University,
- ~ University of California at Berkeley,
- ~ Dakota Rural Action annual conference,
- ~ U.S. Farmers and Ranchers Alliance panel,
- ~ Illinois Renewable Energy and Sustainable Life Conference, and
- ~ Institute for Postmodern Development in China (conference held in California).
- ~ Whiterock Conservancy Board of Directors,
- ~ Board of the Food Commons,
- ~ National Commission on Industrial Farm Animal Production (operated by Johns Hopkins School of Public Health and Pew Charitable Trusts),
- ~ Planning Committee of the Inter-Institutional Network of Food, Agriculture and Sustainability,
- ~ Unilever Corporation’s U.S. Sustainability Living Advisory Team,
- ~ American Farmland Trust Growing Food Connections Advisory Team,
- ~ National Agriculture of the Middle Coordinating Committee, and
- ~ Various academic programs, including the ISU Graduate Program in Sustainable Agriculture.

Public service continues to be an important part of Kirschenmann’s career. Among the organizations for which he provides continued guidance and counsel are the:

EVALUATION MEASURES LEOPOLD CENTER IMPACTS

Since its beginning in the late 1980s, the Leopold Center has funded more than 500 projects totaling nearly \$20M. These funds have supported sustainable agriculture research, education and outreach that promote healthy communities and landscapes in Iowa.

What difference has this funding made? To begin the arduous process of answering this question, Leopold Center evaluator Corry Bregendahl facilitated a process with staff to identify projects that were considered exemplary in achieving Leopold Center goals. Six projects met this criterion and each had received long-term funding from the Leopold Center. Among them, with the years and dollars evaluated, are:

1. Low-Input High-Diversity Systems (\$357,479; 2004-2012). Performance comparisons of conventional and diverse crop rotation systems.
2. Long-Term Agroecological Research (\$900,000; 1998-2012). Comparison of organic and conventional agriculture and cropping.
3. Hoop Houses for Alternative Hog Production (\$526,451; 1997-2012). Comparison of hoop structures versus conventional facilities for livestock production.
4. Regional Food Systems Working Group (\$922,837; 2003-2012). Engaging diverse value chain partners in regional food systems development.
5. Bear Creek Riparian Buffer Project (\$900,000; 1990-2012). Working with landowners to mitigate detrimental effects of agriculture on the landscape by installing a chain of riparian buffers.
6. Practical Farmers of Iowa (\$100,000 in 2011-2012 and \$167,117 for Pork Niche Market Working Group in 2001-2013). Connecting Iowa farmers with PFI staff and researchers to investigate on-farm research and demonstration priorities. Fostering the success of highly differentiated pork value chains that are profitable and sustaining.

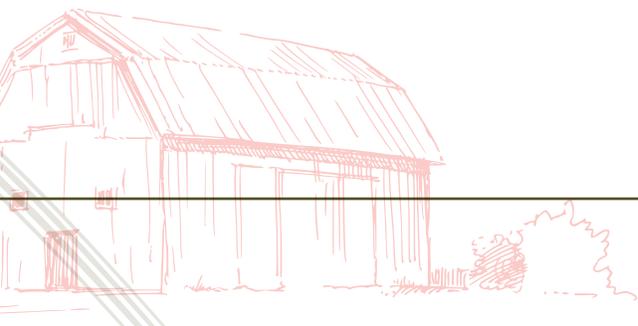
Bregendahl then worked with Sustainable Agriculture graduate student Laura Kleiman to develop a plan for documenting outcomes and impacts associated with these six projects. Kleiman led the effort, mining Leopold Center archives, combing research and project reports, and interviewing project investigators and other key personnel to systematically track and catalogue data. After coding and analyzing the data and reviewing results with project investigators, six two-page funding briefs were developed that capture the most significant impacts of each project. The briefs are a testament to the dedication and partnerships developed by principal investigators who carried out the work.

Analysis of data compiled from the Low-Input High-Diversity Systems, Long-Term Agroecological Research, Hoop Houses, Regional Food Systems Working Group, Bear Creek and Practical Farmers of Iowa showed that these six projects together have garnered 22 percent of Leopold Center grant funding in the past 10 years. Outcomes described below, therefore, represent only a small portion of the impacts of this work in Iowa.

- ~ The Leopold Center invested \$3,873,884 in these six projects.
- ~ The projects leveraged an additional \$17,911,553. This means that for every dollar the Leopold Center spent, an additional \$4.60 was leveraged to complement or expand the work. Leopold Center funding, therefore, offered seed money that continues to yield additional income and investment in the state of Iowa.
- ~ 22,500 acres were converted to conservation uses (i.e., riparian buffers to reduce nitrate runoff and soil erosion and to improve water quality and wildlife habitat).
- ~ 51,277 individuals participated in project-related outreach activities; 12,932 (25 percent) of whom were farmers and agricultural professionals.
- ~ 1,078 farmers either profited or changed their farming practices to implement conservation measures as a result of these projects, accounting for more than 100 farmers per year.
- ~ 121 key public, private and civic sector organizational partners were or still are involved in the work of these projects. (Individual partners were not counted.)
- ~ 255 ISU-affiliated individuals were supported by these projects, or 25 per year (132 undergraduates, 55 graduate students, 39 faculty members, and 29 visiting professors).

The Leopold Center is grateful to the many partners who have made this work a success, and to the target audiences who continue to take a lead role in changing the conditions that improve the health of Iowa's communities and landscapes.

To learn more about the briefs, visit the website at: www.leopold.iastate.edu/change





Spencer Award Ceremony (left to right): Mark Rasmussen, Jan Libbey, Tim Landgraf, Laura Jackson



SPENCER AWARD FOR 2012 HONORS TWO DEEPLY COMMITTED IOWA FARMERS

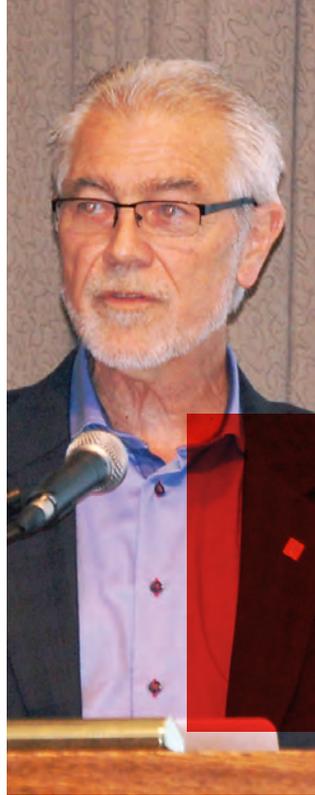
“The landscape of any farm is the owner’s portrait of himself.”
-Cecilia Leopold

Jan Libbey and Tim Landgraf farm in Hancock County. That simple statement doesn’t do justice to their accomplishments in operating their One Step at a Time Gardens community supported agriculture (CSA) enterprise, one of the first such businesses in their part of north central Iowa. It helps explain why they were chosen to receive the Spencer Award for Sustainable Agriculture after being nominated by Practical Farmers of Iowa, where they have been longtime active members.

Libbey and Landgraf started their CSA enterprise in 1996 as a part-time gig, and expanded to full-time operators in 2002. Nine of their 132 acres are reserved for growing vegetables. Another 45 acres have been shifted to permanent cover, giving the couple an opportunity to plant prairie grasses and flowers, shrubs and trees, and restore wetlands on the property. Their sustainable agriculture credibility is enhanced by their use of composted animal manures, diverse crop rotations, shallow cultivation, mulching and grass pathways. In addition to growing produce for their CSA customers, they market nearly 650 chickens that are raised in a pastured poultry setup each summer. They have hired summer interns since 2003 and appreciate their energy and enthusiasm.

One of the letters supporting their nomination commented: “What was most fascinating was how – even in the early years – they were clear about this being a full-fledged farm. . . . Their work was a model, but it was not an impossible ideal. It was something others could do and have done since then, because Tim and Jan also are deeply committed to sharing what they have learned, one step at a time.”

Leopold Center advisory board member Laura Jackson, who had studied prairie plant life at the Libbey-Landgraf farm, presented the award to the couple at the Practical Farmers of Iowa annual conference January 11, 2013 in Ames.



Hans Herren,
2013 Shivvers Lecturer

“There can be no doubt that a society rooted in the soil is more stable than one rooted in pavements.”
-Odo Leopold

“CHANGING COURSE IN GLOBAL AGRICULTURE” EXPLAINED BY HANS HERREN

The annual Shivvers Memorial Lecture often has focused on the many challenges – economic and environmental – facing U.S. agriculture. The 2013 Shivvers Lecture, presented by Hans Herren, had a decidedly international flavor. Herren, a World Food Prize Laureate, is president of the Washington-based Millennium Institute, an international NGO that promotes sustainable development. His April 7 speech at Iowa State University stressed the need for transforming world food production systems with reliance on principles that will allow agriculture to thrive in all the world’s cultures.

“We have to find solutions on how to produce more food in a sustainable way,” Herren said, “We should also refocus agricultural research toward development of sustainable production systems, value of

ecosystem services, adaptation to climate risk and adding value at the farm level to improve farmer’s income.”

He frequently referred to his work as co-leader of the task force that delivered a 2008 United Nations report called “Agriculture at the Crossroads.” The report emerged from the International Assessment of Agricultural Knowledge, Science and Technology for Development (IAASTD), a multi-year project, commissioned by six U.N. agencies.

Some of the points he stressed with his Iowa audience:

~ The current food production system is wasteful, too energy-intensive, puts too much carbon in the air and too little water in the ground, is tied to health problems and is not sustainable.

- ~ We need to eat less meat and more fruits and vegetables.
- ~ We are relying on too few crops, and a small number of genotypes within those crops.
- ~ More public sector money needs to go to public-sector agriculture research.
- ~ We need more life in the soil.
- ~ Biological approaches can be applied to our food systems, but this requires dissemination and re-establishment of knowledge to growers.
- ~ New agricultural systems should focus on small-scale and family farmers and women.

Herren grew up on a farm in the lower Rhone Valley of Switzerland, near Lake Geneva, and shared the details

of his personal farming roots. He received the World Food Prize in 1995 for his work on a biological pest campaign to control the cassava mealy bug, which infects a staple root crop used by more than 200 million people in Africa. In the end, he challenged the audience of 180 in ISU’s Memorial Union: “We can do many things, but they need to be done with the brain and not just the wallet. The question is not whether alternative systems can feed the world, but how is the present model feeding and nourishing the world?”

The podcast of his presentation appears at: www.leopold.iastate.edu/news/calendar/2013-04-07/2013-shivvers-memorial-lecture-hans-herren



Above: Lydia Rae Levinson
Below: Eric Ports



GPSA ENTERS SECOND DECADE WITH LEOPOLD BACKING

The Graduate Program in Sustainable Agriculture (GPSA), which offers students a unique educational opportunity, is one of the proudest accomplishments of the ISU sustainable agriculture community. The Leopold Center has provided support for the GPSA during its 11 years of existence. The GPSA used Leopold Center dollars to fund three research assistantships in FY2013. The stipend recipients describe their work:

Eric Ports

Master's degree in Community and Regional Planning

My two interests in planning are the provision of adequate affordable housing and the preservation of agricultural land near growing metropolitan areas. Unfortunately, these two goals often are at odds. Agricultural land protection frequently slows the development of residential suburbs and

raises the overall housing cost of the metropolitan area. My work is aimed at finding a way for cities to balance housing and agriculture while recognizing the difficult trade-offs that are part and parcel of pursuing sustainability. Sustainable development cannot happen at the expense of the poor. The field research for my thesis will take place in a few municipalities in metropolitan Atlanta.

Lydia Rae Levinson

Master's degree in Community and Regional Planning

During the fall 2012 semester I researched the potential for the inclusion of urban agriculture within the Des Moines Metro's Tomorrow Plan, as well as pursuing research with my major professor regarding educational inequality in Latin American countries. In the spring 2013 semester, I conducted a literature review

of the use of the Gini coefficient as a metric for educational inequality. I worked with ISU Design Extension and Outreach and the Iowa Department of Public Health on the award-winning IWALK program for creating sustainable, walkable communities through coalition-building and participatory geospatial research. I helped write several journal articles (pending submission by ISU Extension and Outreach) and one grant.

Amy Alesch

PhD in Plant Pathology

Amy provided teaching and logistical support for SUSAG 509, Agroecosystems Analysis, for the fall 2012 term. She also accompanied the group on the two-week field trip and facilitated learning among student groups by leading discussions.

“No matter how intently one studies the hundred little dramas of the woods and meadows, one can never learn all the salient facts about any one of them.”

- Aldo Leopold

COMPETITIVE EDUCATIONAL SUPPORT PROGRAM SUPPORTS 10 IOWA EVENTS

The Leopold Center provides financial assistance to sustainable agriculture outreach activities sponsored by other groups through its Competitive Educational Support Program (CESP). The program offers participants up to \$1,000 to stage one-time educational events, programs, workshops, conferences or displays that further the mandated mission of the Center. Iowa nonprofit organizations, agencies and educational institutions are eligible to apply for funds. Applications are reviewed by several Leopold Center staff members and an advisory board member, with program management provided by communications specialist Laura Miller. See more details at www.leopold.iastate.edu/grants/education.

CESP provided support for these FY2013 events at a cost of \$7,942:

July 2012

- ~ ISU Dining, Farm to ISU Farm Crawl; ISU dining employees toured area farms that provide produce, including De Moss Pumpkin Farm, Gilbert, and Berry Patch Farm and Table Top Farm, Nevada.
- ~ ISU Sustainable Agriculture Student Association; dormitory costs for 70 youth attending the 2012 Rooted in Community's 14th annual Summer Summit at Iowa State University, including field trips to area farms, youth-led workshops on trellis building, history of the food movement, food access and a mock press conference.

September 2012

- ~ ISU Extension and Outreach; for displays and two farm tours (produce value chain and local meats) that were part of a training session, Building Partnerships in the Iowa Food System, Ames, for 70 extension professionals.
- ~ Seed Savers Exchange, Decorah; one CESP grant covered the cost for three speakers who presented the fall 2012 Harvest Lecture series; first was public plant breeder Bill Tracy.

October 2012

- ~ Iowa Environmental Council; afternoon speakers at the IEC's annual conference, Finding Iowa's Way: Economic Solutions for a Healthier Environment, Des Moines.

- ~ Central College, Pella; two-day residency by Novella Carpenter, author of *Farm City: The Education of an Urban Farmer*, that included speaking to several classes, a public presentation and an all-Iowa meal.
- ~ Wallace Chair for Sustainable Agriculture; speaker costs for 2012 Pesek Colloquium for Sustainable Agriculture featuring landscape ecologist Erle Ellis, and attended by about 400 people. (Lecture is archived at: www.leopold.iastate.edu/news/calendar/archive)
- ~ Seed Savers Exchange, Decorah; one CESP grant covered the cost for speakers who presented the fall 2012 Harvest Lecture series; second were food system/food access experts Dan Carmody and Emily Torgimson (Audio podcast archived at: www.leopold.iastate.edu/news/calendar/archive)

November 2012

- ~ Maharishi University of Management Department of Sustainable Living; travel expenses for permaculture expert Darren Doherty of Australia to present a free evening lecture and one-day workshop on the basics of keyline design, "Drought-Proofing Your Farm". (Lecture is archived at: www.leopold.iastate.edu/news/calendar/archive)
- ~ Seed Savers Exchange, Decorah; one CESP grant covered the cost for speakers who presented the fall 2012 Harvest Lecture series; third was apple breeder Dan Bussey. (Audio podcast archived at: www.leopold.iastate.edu/news/calendar/archive)

February 2013

- ~ Iowa Valley RC&D; keynote speaker expenses for Angie Hawk Maiden from ACEnet in Athens, Ohio (food business incubators) at the Third Annual Come to the Table Summit in Johnson County. (Panel discussion archived at: www.leopold.iastate.edu/news/calendar/archive)

March 2013

- ~ Iowa Network for Community Agriculture; scholarships for students/farmers to attend the Eat Fresh Southern Iowa Local Foods Conference in Albia.

Left: Darren Doherty (November 2012), photo by Molly Reiff
Center: ISU Dining at Berry Patch Farm (July 2012), photo by Courtney Long
Right: Lee Burras at Sustainable Ag Students event (July 2012), photo by Julie Whitson





Left: Joe Hannan
Right: Ajay Nair

LEOPOLD CENTER SUPPORTS TWO ISU HORTICULTURE STAFF MEMBERS AND THEIR EARLY CAREER ACTIVITIES

The Leopold Center has been able to provide financial assistance for two new ISU horticulture staff members since 2010, thanks to an unrestricted estate gift. Their three-year funding commitments end this year, and both have made good use of Leopold Center assets. They have been working with fruit and vegetable growers who are a prime target of the Center's marketing and food systems activities.

Joe Hannan is an ISU Extension field specialist in horticulture. One of his first tasks was building a one-stop shop website for commercial fruit and vegetable growers. The website (at www.IowaProduce.org) features production guides, research reports, business plans, links to other resources and common vendors. He also created and edits a monthly e-newsletter that reaches more than 265 subscribers including ISU Extension and Outreach employees, farmers and industry supporters. Seasonal topics, workshop and field day announcements, and other industry matters are covered.

He works very closely with fellow horticulturists Ajay Nair and Linda Naeve on high tunnel programs. Hannan and Naeve offer several "High Tunnel 101" courses each year to meet the growing demand from new Iowa high tunnel farmers taking advantage of the NRCS-USDA EQIP program. These workshops are designed to provide the basic knowledge the farmers need to construct and start producing in their high tunnels. In fall 2012, the team completely redesigned and updated the workshop with fresh content, a friendlier format, and a new web-based interactive resource guide. To meet the needs of the established and more sophisticated high tunnel growers, they partnered with the Iowa Fruit and Vegetable Growers Association (IFVGA) to create an advanced high tunnel series. The first workshop in the series was a Tomato Production workshop offered as part of the annual IFVGA conference in January 2013, and it will be offered in the fall. It was so successful that Hannan and his colleagues will partner with the IFVGA to offer a brambles workshop at their 2014 conference. Hannan also served on the IFVGA board as an advisory member.

As chair of the Iowa Food System Working Group's (IFSWG) resource development committee, Hannan led the effort to develop a new web hub at Iowa State University. The ISU Local Foods Hub (IowaFoodsystem.org) brings together all other ISU sites, videos, blogs, news articles, publications and materials, and digital content related to local foods. An embedded video player uses a newly created local foods playlist from the ISU Extension and Outreach YouTube Channel.

Ajay Nair, an assistant professor of horticulture, set up the ISU Sustainable Vegetable Production Laboratory to focus on applied and fundamental research aspects in vegetable production. In the past two years, the lab has undertaken key projects in vegetable crop production including transplant production, cover crops, high tunnels, weed management and food safety. A number of these projects, including establishment of the lab, were supported by the Leopold Center.

The Sustainable Vegetable Production Lab (www.extension.iastate.edu/vegetablelab) features up-to-date tools, equipment and instruments to carry out greenhouse and field-based research. The lab also conducts nutrient extraction for soil and tissue samples. In addition to chemical analyses, the lab recently expanded to study the effect of production systems on soil quality and health. One of the assays conducted in the lab, called Community Level Physiological Profiling, sheds information on microbial population diversity and population shifts in the soil. By focusing on soil quality indicators such as microbial diversity, researchers hope to document the relationship between grower practices and their effects on soil microbial populations.

Leopold Center funds also were instrumental in attracting talented graduate students and undergraduate research-aides. The lab recruited three M.S. graduate students who are investigating the role of sustainable production practices such as the use of biochar, summer cover crops, and strip tillage to improve chemical, physical and biological properties of soils. Currently the lab is conducting



Above: Yellow mustard and oilseed radish at Rinehart Farms
Below: Hairy vetch cover crop at Muscatine Island research station

studies on the use of biochar for commercial vegetable production, cover crops to improve soil quality and health, the role of plastic mulches in vegetable production, mitigating plant stress in high tunnels, season extension strategies, and new and diversified crops for Iowa. The lab has trained six undergraduate students in research methodologies and helps them acquire skills in conducting field and lab experiments in vegetable production.

The laboratory has emphasized dissemination of research results to growers through field days, seminars and workshops. There have been several workshops in partnership with Leopold Center, Practical Farmers of Iowa and the IFVGA, including:

- ~ Transplant production workshop,
- ~ Tomato grafting and pest management workshop,
- ~ Cover crop workshops, and
- ~ Advanced high tunnel workshops.

These events yielded grower inputs and feedback that helped address practical challenges and issues in vegetable production. On-farm trials also have been a key component in research activities. In the last two years, there were five on-farm trials that examined cover crops and high tunnel crop production. The lab has actively engaged grower organizations, researchers, growers, extension staff and vegetable industry personnel in developing a roadmap to support increased vegetable production in Iowa. Among the important collaborators are: IFSWG, Practical Farmers of Iowa, IFVGA, Natural Resources Conservation Services staff in Iowa, Iowa Department of Agriculture and Land Stewardship, and USDA-Sustainable Agriculture Research and Education.

“A thing is right when it tends to preserve the integrity, stability and beauty of the biotic community. It is wrong when it tends otherwise.”

- Aldo Leopold



HENRY A. WALLACE CHAIR USES LEOPOLD CENTER SUPPORT TO AID GRAD STUDENT

“Individual thinkers since the days of Ezekiel and Isaiah have asserted that the despoliation of land is not only inexpedient but wrong. Society, however, has not yet affirmed their belief.”

- Aldo Leopold

The Henry A. Wallace Chair for Sustainable Agriculture, currently held by ISU Agronomy professor Matt Liebman, annually receives \$20,000 of support from the Leopold Center. Liebman’s current research, outreach and teaching activities focus on ways to use ecological processes to reduce dependency on agrichemicals and fossil fuels.

His academic interests that dovetail with the goals of the Wallace Chair include: (1) use of perennial crops and prairie species as biofuel feedstocks; (2) weed suppression by diverse crop rotations and rodents and insects that consume weed seeds; (3) nutrient cycling in integrated crop-livestock systems; (4) energy costs and economic returns associated with simple and diverse rotation

systems; and (5) dynamics of native plant communities in filter and buffer strips constructed in and around corn and soybean fields. For more details about the research being conducted by the Wallace Chair program, see www.wallacechair.iastate.edu.

Funding from the Leopold Center contributed to the support of a graduate student pursuing a degree in the ISU Graduate Program for Sustainable Agriculture. The Center’s grant award was used to support a stipend, tuition, fees and benefits for Julie Mueller. In addition to the financial support Mueller received from this grant, the Department of Agronomy provided \$15,358 to supplement that funding. Mueller began her work at Iowa State University in 2012

and is pursuing a Master’s degree in Sustainable Agriculture. Her research is based at the Neal Smith National Wildlife Refuge near Prairie City, Iowa, and is a part of the Science-based Trials of Rowcrops Integrated with Prairies (STRIPS) project located there. Her work compares the soil health, particularly the microbial communities, of prairie landscapes and conventional cropping systems. (For more information about STRIPS, see www.prairiestrips.org)

The funds from the Leopold Center also support other segments of the Wallace Chair program, including support staff salary, transportation costs to research plots, and materials and supplies for lab and field research led by Liebman.



Nate Stevenson, graphic designer and educator, explains the rainfall simulator



“Conservation will ultimately boil down to rewarding the private landowner who conserves the public interest.”

- Aldo Leopold

IOWA LEARNING FARMS AIMS EDUCATION AT IOWANS OF ALL AGES

The Leopold Center is providing \$50,000 annually for three years to the Iowa Learning Farms (ILF) for use in outreach activities to promote water quality. 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. (See www.extension.iastate.edu/ilf/)

Water Rocks!

Teaching Iowans about the importance of good soil and clean water and how to sustain them is the goal of Iowa Learning Farms and its new sister program Water Rocks! (See: www.waterrocks.org/)

Water Rocks! uses multimedia tools to teach youth about soil and water and agriculture in Iowa. An online game “Rock Your Watershed!” was developed using science to teach about land treatments including tillage, cover crops, prairies and wetlands. The game won national recognition for educational aids from the American Society of Agricultural and Biological Engineers (ASABE) in 2013.

Other Water Rocks! components include educational videos, music videos, geocaching, classroom visits by the Water Rocks! Team, Conservation Station visits and a teacher-education summit. The videos are shown on the program’s website and offer a light-hearted approach to teaching about water and its importance to all Iowans.

Water Rocks! programmers are working with many Iowa state parks, establishing geocaches within them. Geocaching is a treasure hunt of sorts, locating caches hidden within the parks using specific coordinates on GPS devices or smart phones.

The Leopold Center, Iowa Department of Natural Resources and Iowa State University Extension and Outreach fund this campaign.

Education for farmers

Iowa Learning Farms holds field days, workshops and presentations year-round, gathering farmers together to share experiences and success stories of how conservation practices such as no-till and strip-till, cover crops and drainage water management have worked on Iowa’s farms.

Between July 2012 and June 2013, Iowa Learning Farms held 26 field days and workshops for farmers with a total of 1,381 attendees. The numbers show that Iowa Learning Farms truly is making a difference on the land. According to the responses of those who completed the ILF 2012 evaluations:

- ~ An average of 34 percent of farmers increased surface residue management on more than 71,000 new acres of strip-till or no-till.
- ~ An average per farm increase of 422 acres was put into strip-till or no-till.
- ~ An average of 39 percent of farmers increased surface residue management on more than 18,000 new acres of cover crops since 2010.
- ~ An average of 197 increased acres saw cover crops added since 2010.

Iowa Learning Farms and the Iowa Cover Crop Working Group continue to explore cover crops usage. On-farm demonstration work continues on 8 sites across the state using a cereal rye cover crop on corn-soybean acres. These plots are in their fifth year of study. A series of field days and workshops that focused on cover crops were held and drew large attendance numbers, showing the growing interest in this conservation practice.

ILF has established five research and demonstration plots across the state using cover crop mixtures, which will be seeded in fall 2013. Cover crop mixtures include tillage radish, turnips, winter peas, clover and other varieties.



ECOLOGY INITIATIVE



ECOLOGY INITIATIVE FOCUSES ON MOVING PRACTICES FROM DEMONSTRATION TO USAGE

A key challenge for the Leopold Center's Ecology Initiative is moving competitive grants research results into practices that link Leopold's philosophy with solutions to the current list of "wicked problems" (climate, resource and waste use and limits, loss of biodiversity'). Soil health and agricultural and ecological diversity have been identified as priorities for basic research, but the question remains of how to translate the research gains into production systems. One strategic approach is to encourage research teams and working groups to bridge the divide. FY2013 was a productive year for highlighting how these "slow investments" in small, multi-year research projects are transformed by teams and working groups into 'Leopold-appropriate practices' that catalyze both public attention and agricultural entrepreneur's interest. Work in the Ecology Initiative is coordinated by Jeri Neal.

Cover Crops

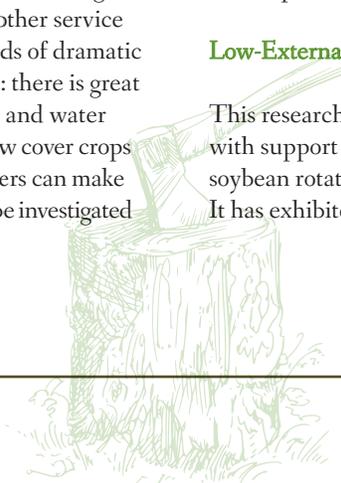
Initial investments in Iowa cover crops research, participation in the Midwest Cover Crops Council and support of development of Iowa cover crops selector tools has helped expand the use of cover crops by Iowa corn and soybean producers. Cover crops are poised to become part of mainstream Iowa agriculture after being featured in major farm magazines, with demonstrations and on-farm applications. Their use also has been supported by technical consulting from the Center's partners at Practical Farmers of Iowa, as well as Iowa Learning Farms, Natural Resources Conservation Service and other service agencies. Adoption was further spurred by the demands of dramatic weather events such as the 2012 drought. Bottom line: there is great positive potential for cover crops to better manage soil and water resources. Practical research questions (for example, how cover crops function in the soil and with other crops, and how farmers can make best choices about what and when to plant) continue to be investigated through ecology competitive grants.

Science-based Trials of Rowcrops Integrated with Prairies (STRIPS)

Planting prairie strips in row-cropped fields is an immediately applicable conservation approach pioneered by the Science-based Trials of Rowcrops Integrated with Prairies (STRIPS) research team. Research shows that planting 10 to 20 percent of a watershed in native prairie reduces the amount of sediment leaving the watershed by more than 90 percent. Nitrate and phosphorus movement also decrease, protecting the quality of nearby waterways. Why rely on prairie? The deep roots and stiff, upright stems of native prairie plants slow surface runoff and hold soil in place more effectively than cool-season plantings such as brome, and also create better wildlife habitat. Even small patches of prairie have the potential to greatly improve a farm's resilience to extreme climatic events, such as heavy rainfall and flooding. The Ecology Initiative provided funding for initial pre-STRIPS conversations in 2002 and has supported the project since then. In FY2013 landowners and agency stakeholders, seeing the significant difference STRIPS can make, have joined forces to work with the research team to launch an "implementation" stage for the research. The team has its first farmer adopter with strips plantings installed, and there is interest across the state from farmers and landowners who want to pilot the practice. Bottom line: Adoption of research findings is the ultimate goal of the Center's investments. STRIPS practices can make a difference, and the initiative and its partners are working to establish them on the ground.

Low-External Input (LEI) cropping

This research began with a Leopold competitive grant in 2003 and with support for the rest of the decade has compared two-year corn-soybean rotations with longer-term (three- and four-year) rotations. It has exhibited so many advantages, such as higher yields, lower





“The destruction of soil is the most fundamental kind of economic loss which the human race can suffer.”
- Aldo Leopold

energy use and effective weed and pest management with far fewer chemicals, and comparable economic return that it has made an outsized impact. The results, published in a peer-reviewed online journal, *PLoS ONE*, on October 10, 2012, have been viewed more than 26,000 times: “Substantial improvements in the environmental sustainability of agriculture are achievable now, without sacrificing food production or farmer livelihoods...More diverse cropping systems can use small amounts of synthetic agrichemical inputs as powerful tools with which to tune, rather than drive, agroecosystem performance, while meeting or exceeding the performance of less diverse systems.”²

The research has been featured in national media such as the *New York Times*, *Discover*, *Wired Science* and *Grist*, as well as local and regional newspapers and radio programs Talk of Iowa and Successful Farming Radio. The study has been tagged in more than 350 Facebook posts and 100 Twitter tweets.

This research makes the case for diversity in cropping systems that can create positive synergistic effects. The key to the success is diversity. Bottom line: widespread adoption of extended rotations is a desirable change in practices that will require engagement and commitment from stakeholders in and beyond the agricultural community.

MidAmerican Agroforestry Working Group (MAAWG)

Agroforestry intentionally mixes trees and shrubs into crop and animal production systems to generate environmental, economic and social benefits. The working group, convened and facilitated through the Ecology Initiative, provides a resource for advancing the science, practice and adoption of agroforestry by landowners and natural resource managers in the Midwest region of the United States. The team’s focus this year has been on communications. It

served as a working group for a Mississippi Basin consortium, Green Lands, Blue Waters; acquired Sustainable Agriculture Research and Education (SARE) funds to create and conduct two five-day training academies; and leveraged National Agroforestry Center dollars to launch a communications plan that included a website, case studies, print materials, and news releases. Team members also are conducting demonstration and outreach efforts in Minnesota and researching carbon sequestration on marginal lands in the Midwest. Bottom line: although often overlooked, agroforestry offers a diverse set of services – food, fiber, energy and enterprise options; sediment and nutrient runoff reduction; carbon sequestration; soil improvement; biodiversity increases; and improved habitat for pollinators, insects, fish and wildlife – that could contribute significantly to working landscape sustainability.

Neal was an invited participant in several regional working groups, networks and trainings initiated by Center partners. Among them were:

- ~ “Grand Opportunities and Challenges” workshop, Minnesota;
- ~ Carbon, Energy and Climate training, Michigan, Nebraska and Illinois;
- ~ Leopold Leadership training, West Virginia; and
- ~ Midwest Conservation Biomass Initiative (a new public-private effort).

She serves as co-chair for the steering committee for the Green Lands, Blue Waters Mississippi River Basin collaborative, and as a technical advisor on the Research, Development and Knowledge Sharing Work Group for the nationwide effort ‘Solutions from the Land,’ which is sponsored by the United Nations Foundation and Conservation International with support from The Nature Conservancy.

¹Rockström, J, Steffen, WL, and 26 others (2009), “Planetary Boundaries: Exploring the Safe Operating Space for Humanity”, *Ecology and Society* 14(2): 32

²Davis, AS, Hill, JD, Chase, CA, Johanns, AM, Liebman, M (2012), Increasing Cropping System Diversity Balances Productivity, Profitability and Environmental Health. *PLoS ONE* 7(10): e47149. doi:10.1371/journal.pone.0047149



MARKETING AND FOOD SYSTEMS INITIATIVE



The Marketing and Food Systems Initiative (MFSI) work in FY2013 was directed by program manager Craig Chase with support from Lynn Heuss and Laura Kleiman (beginning in May 2013). Among the Center's key food systems enhancement efforts during the year were:

- ~ managing of Leopold Center-funded competitive grants, developing and administering mini-grants,
- ~ further transitioning of Value Chain Partnerships and the Regional Food Systems Working Group (RFSWG) to independently functioning organizations,
- ~ making progress on food system development through the Local Food and Farm Initiative,
- ~ initiating the development and coordination of the Iowa Food System Working Group (IFSWG) within ISU Extension and Outreach, and
- ~ further connecting local food system participants and organizations through small grant projects.

Value Chain Partnerships (VCP)

Each of the VCP groups completed their transition from Leopold Center jurisdiction to independent functioning in 2012-13. All have shifted to being run by independent leadership with no coordination being provided by MFSI. The RFSWG steering committee is developing a strategic plan to determine a permanent funding strategy when their funds from the Leopold Center come to an end in 2014. The RFSWG still meets quarterly and has 15 member groups active in 90 of the 99 Iowa counties.

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

The final report for the FY2012 Local Food and Farm Initiative efforts (SF-509) was submitted in July 2012. In addition to describing the progress made during the year, the report outlined recommendations for further work related to business development (food hubs, food processing centers, etc.). Several special projects were funded during FY 2013. The Iowa Legislature approved and the Governor signed a renewal of the Initiative for FY2013 in June. The funding level remained at \$75,000; of that amount it is expected that approximately \$9,000 will be used to fund special projects. A research assistant (Laura Kleiman) was added to the Leopold Center staff to help determine what is currently known about business development strategies and what research needs are not being met. A local food system summit was held in March 2013 with approximately 100 people attending. They discussed progress made related to business development, beginning farmer programs, and food incentives (primarily through farm to school programs). National and state experts shared their knowledge and experience to energize the discussion on logical next steps in local food system development in Iowa.

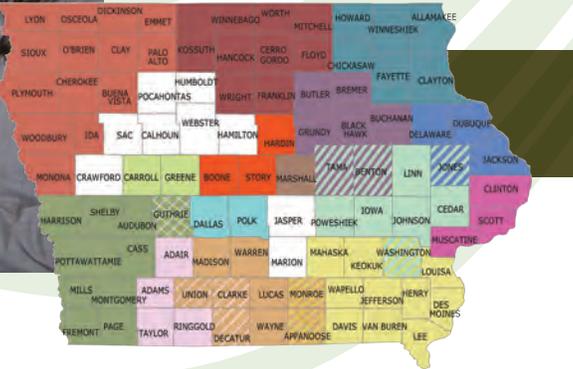
Several groups received funding for special projects during FY2013:

- ~ **National Center for Appropriate Technology**, to increase awareness and understanding of Iowa's Farm to School movement by researching best practices and stories from across the state and archiving them on a newly created website (www.iowafarmtoschool.org).
- ~ **Winnebago County Extension and Outreach District**, to develop a process to manage and replenish inventory in grocery stores. More efficient inventory management will lead to improvements in profit margins and sales volumes, further enticing growers and processors to participate in joint food hub marketing efforts.





John O'Sullivan, keynote speaker at the March 2013 Iowa Local Food Conference, talks to Jessica Burt Fogarty, RFSWG assistant coordinator



“The last word in ignorance is the man who says of an animal or plant: ‘What good is it?’”
- Aldo Leopold

~ **Wallace Centers of Iowa**, to develop a unique and comprehensive small farm apprenticeship program for individuals who want to farm in a sustainable agriculture program. The training will provide hands-on experience ranging from planning crops to canning produce, along with learning about the financial side of the farming business.

MFSI Mini-grants

Three non-competitive mini-grants were funded through the Marketing and Food System Initiative. They were awarded to:

- ~ Joanna Hamilton (former Leopold Center intern from Tufts University) to develop a guide for decision makers or practitioners outlining the best practices related to starting a food hub. Organizational structure (form versus function), decision-making processes, food hub deliverables (aggregation point, light processing, marketing, and/or other food hub activities), and review of USDA case studies will be included in the guide.
- ~ Phase II of graduate student Kevin Duerfeldt's study on food hubs focusing on a SWOT (strengths, weaknesses, opportunities, and threats) analysis for the various types of food hubs in Iowa.
- ~ The Winneshiek County Extension and Outreach District to develop a potential structure for a food brokerage business. The framework includes profit margin determination, delivery schedule, product promotion and other typical small business operations.

Iowa Food System Working Group (IFSWG)

The Iowa Food System Working Group was established to increase the efficiency and effectiveness of an overall ISU Extension and Outreach program in local food systems and maximize the resources

available to all Extension units. ISU Extension units are grounded in both academic disciplines and geography. However, many topics of interest to Extension clientele such as local food system development are interdisciplinary, complex and must involve multiple programming activities and delivery methods. A connection with IFSWG (and ISU Extension and Outreach) will help expand the efforts funded through MFSI and the Local Food and Farm Initiative. Learn more about the IFSWG at www.iowafoodsystem.org.

New Publications and Cool Tools

Among the publications and cool tools developed or updated through the Marketing and Food Systems Initiative during FY2013:

Cool Tools (See www.leopold.iastate.edu/cool_tools)

- ~ Transplant Production Decision Tool

Publications (Locate by title at www.leopold.iastate.edu/pubs/alpha)

- ~ Iowa Food Marketing Regulations: A Guide for Small Scale Producers
- ~ Scaling Up: Perspectives from Growers and Buyers on Barriers and Benefits to Wholesale Marketing of Local Fruits and Vegetables
- ~ RFSWG Data Collection Guide
- ~ Sharing the Lessons Learned from the March 2013 Iowa Local Food Conference
- ~ Food Facts: Results from Marketing and Food Systems Research (updated)



POLICY INITIATIVE



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 public advocacy or promotion of specific policy alternatives. Mary Adams, Leopold Center outreach and policy coordinator, managed the initiative activities this year.

Sustainable Agricultural Land Tenure (SALT)

The Sustainable Agricultural Land Tenure (SALT) program, now in its third year, continued to conduct related research as well as produce new outreach materials. After the 2012 drought, the Drake Agricultural Law Center staff adapted research to begin examining the impact of the drought on land tenure arrangements. The Law Center, in partnership with the Women, Food and Agriculture Network (WFAN), completed a new video series that looks at the unique issues faced by women landowners and how outreach can be tailored to meet their needs. (These videos are available at SustainableFarmLease.org, WFAN.org and the Leopold Center website.) The project has launched a new website, WomenCaringfortheLand.org, a site that supplements WFAN's Conservation Outreach Curriculum for non-operator landowners. More than 500 copies of "The Landowner's Guide to Sustainable Farm Leasing" were printed and distributed to organizations and landowners across the state.

Ed Cox, Drake Agricultural Law Center Fellow, met with several NRCS District Conservationists and SWCD Commissioners to discuss their experiences with non-operator landowners, corresponding outreach efforts and potential impact on implementation and enforcement of government conservation programs. Information gained from these meetings will lead to development of educational materials for local agency personnel on reaching out to non-operator landowners and dealing with multiple ownership structures in implementing conservation programs.

The Drake Agricultural Law Center's continuing efforts on the SALT initiative resulted in an invitation to give presentations on two panels at the 2013 Iowa Bar Association Annual Conference. One panel addresses the impact of the *Sallee* case and resulting legislation on farm recreational use. As part of the SALT initiative, Drake staff produced an article on the *Sallee* case, which provided clarification on the Iowa Supreme Court's ruling on Iowa's recreational use statute. The Center's publication sought to quell confusion and provide practical advice on how to deal with liability while allowing the public to utilize private land for non-farming events. The publication was used by the Iowa Legislature in successfully drafting a law to reform the recreational use statute that specifically extends the protection of the statute to educational events.

The other panel at the Iowa Bar Association meeting provided information on the recently completed Trust Ownership survey (part of a grant funded by the Policy Initiative) and how trust documents can be drafted to ensure the long-term protection of land assets that are owned by a trust. The survey was conducted by Cox and Mike Duffy, ISU Extension economist.



Left: SALT website
Right: Ed Cox, Drake
University Agricultural
Law Center

“There are two spiritual dangers in not owning a farm. One is the danger of supposing that breakfast comes from the grocery, and the other that heat comes from the furnace.”

- Aldo Leopold

A survey was developed and sent to conservation professionals, including NRCS District Conservationists and County Conservation Commissioners. This survey posed several questions about current outreach efforts to non-operator landowners, participation of such landowners in conservation programs and opinions about how to improve outreach and participation.

The Agricultural Law Center also is in the process of identifying both non-operator landowners and tenants for in-depth interviews on the impact of extreme climatic events on their operations on rented land and the potential for lease agreements to help mitigate the impact of climate change on the farm and globally.

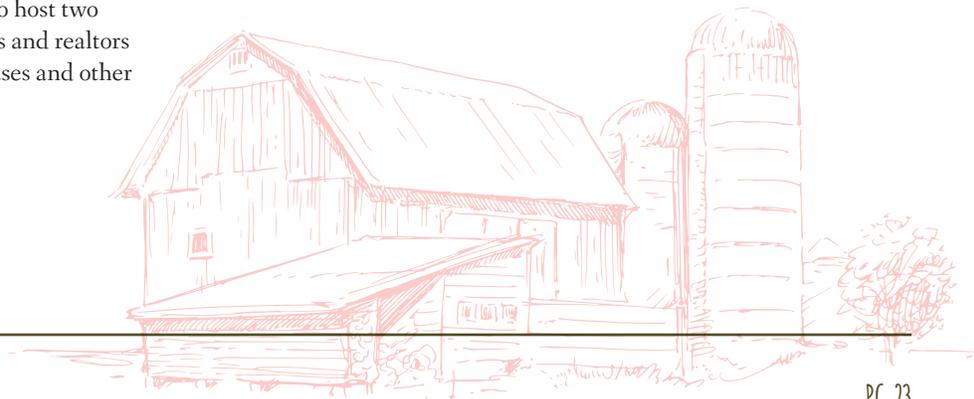
Funds leveraged by SALT

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. The Allamakee SWCD received the grant in fall 2012. The Law Center collaborated with the Allamakee County Conservation District to host two landowner workshops and one meeting with bankers and realtors to provide educational resources on conservation leases and other legal instruments.

Sustainable Land Tenure Working Group

The Sustainable Land Tenure Policy Working Group, funded by the Policy Initiative, met twice at Drake University’s Law Clinic in Des Moines. The group heard a presentation by Leigh Adcock of WFAN on a project devoted to gauging the attitudes of women landowners about conservation and sustainability. Mark Rasmussen talked to the group about the future direction of the Leopold Center’s policy work and his interest in pursuing research on the “vulnerabilities” (economic, political and biological) in the current agricultural structure.

Mike Duffy is using Policy Initiative infrastructure funds to prepare two ISU Extension publications on the costs/mechanics of adding conservation practices for landowners and renters. Duffy and an ISU student have been working on the publications, which are in draft stage with plans to publish by the end of 2013.





CROSS-CUTTING INITIATIVE



Malcolm Robertson
Cross-Cutting Initiative Coordinator

STRENGTHENING THE CENTER'S FOCUS ON ALTERNATIVE AND SYSTEMS AGRICULTURE

Since the beginning of the “Green Revolution” in the 1940s, much of the research associated with agriculture has been focused on yield maximization through the manipulation of one or two elements within an agricultural system. While the “Green Revolution” research paved the way to high-production modern agriculture, there recently has been a growing movement and increased understanding toward looking at farming operations as a system rather than as separate individual elements. This systems research, which is the basis of the Cross-Cutting Initiative, is focused on enhancing sustainable economic, social and environmental impacts by examining agricultural production elements together rather than approaching them individually.

Under the leadership of coordinator Malcolm Robertson, the Cross-Cutting Initiative (the newest of the Leopold Center’s research programs), uses a systems approach to assess agro-ecosystems beyond yield, by incorporating economics, environmental, policy and social aspects in research and outreach programs. This multidisciplinary research approach allows for the identification of trade-offs and synergies among various farming options. The systems approach increases the knowledge base of mechanisms that regulate processes within farms, fields and communities to optimize management while protecting soil, land, watersheds and communities.

Key agroecological systems research areas of interest for the Cross-Cutting Initiative

- ~ **Cropping Systems:** research that investigates alternative crops, crop selection, crop development, cultivation practices and factors that contribute to plant health or productivity
- ~ **Energy:** research that relates to the creation and utilization of energy in agriculture and food production
- ~ **Climate:** a new research area primarily focused on investigating the impact of weather and climate on all aspects of agriculture and food production

Exploring alternatives to conventional agriculture in Iowa

Creating a new young farmer base

To help encourage diversity on the landscape and develop alternative agriculture practices, the Leopold Center allocated a portion of the Cross-Cutting Initiative coordinator’s time (from 2011 to 2013) to develop a new course at Iowa State University. This “capstone” course is designed to give seniors and graduate students experience in the day-to-day planning and operations associated with small and midsize horticultural fruit and vegetable production in Iowa. In the course, business strategies, financial management, production and marketing of the crops grown are carried out by the students. During FY2013, 15 students enrolled in the course to gain hands-on experience needed to help them become successful new farmers in Iowa.



Oak Savanna, Loess Hills

“A conservationist is one who is humbly aware that with each stroke [of the axe] he is writing his signature on the face of the land.”

- Aldo Leopold

Niche enterprises create alternative income sources and diversification for agriculture

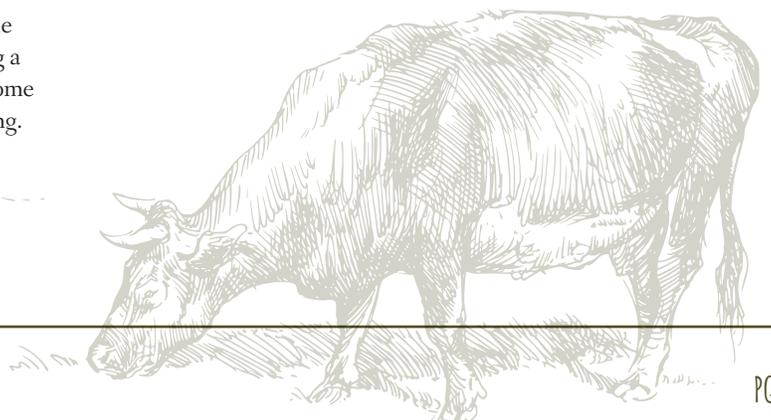
The first step to sustainability is to determine an economically viable path for the farm, whether this means establishing a niche market through alternative agriculture or taking marginal land out of conventional crop production to create biological or financial diversity. During FY2013 the Cross-Cutting Initiative supplied seed money for two specialty grants, both of which could provide an alternative income source for small or midsize farming operations while generating environmental advantages:

- 1) A one-year special grant was awarded to an ISU Extension fisheries specialist to study the potential of aquaponics as an efficient and economically viable form of agriculture for Iowa farms. In this niche enterprise, two unique types of food production take place: hydroponic crop growing in a closed system with fish production (aquaculture). This niche enterprise has the potential to add another income source to a farming operation and can be carried out via small, intensive production systems that do not need a large amount of land space.
- 2) A second specialty grant, funded from both the Ecology and Cross-Cutting Initiatives, was awarded to develop a guide describing how to create a game-bird preserve business in the Midwest. As part of the Leopold Center’s vision of fostering a diverse Iowa landscape, the guide provides an alternative income option for marginal lands that currently are used for cropping.

Partnerships – catalysts for change

The Cross-Cutting Initiative partners directly or indirectly sponsors several Iowa-based working groups or outreach programs centered in the initiative’s key agroecological system focus areas. The aim is to bring together producers, businesses, and state and federal agencies. These working groups/programs focus areas are:

- ~ bioenergy,
- ~ beneficial insects,
- ~ on-farm cooperator research and demonstration, and
- ~ farm energy.



ECOLOGY INITIATIVE

CENTER COMPETITIVE GRANTS PROGRAM FY 2013

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.

The Ecological Systems Research Initiative funded six proposals received from the Summer 2012 RFP. Ten projects received renewals for a second or third year of funding and 11 projects were granted no-cost extensions or were slated to end.

New Ecology grants – FY2013

Total amount awarded – \$124,597

Total number of projects – 6

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, extended 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 Comparison of Biofuel Systems (COBS) Project: Biomass energy conversion and energy return on investment analyses for 2012 growing season, 1 year

F. Miquez, ISU agronomy and V. Nichols, ISU Graduate Program in Sustainable Agriculture and agronomy

Investigators will calculate the theoretical energy yields of corn stover and prairie biomass produced at the COBS (Comparison of Biofuel Systems) site during the 2012 growing season using three different methods. The results will provide data continuity for the multi-year project. The results will inform the Energy Return on Investment calculations and the choice of analytical method used in the ongoing research, as well as the comparison of the economic and environmental aspects of the five mixed annual and perennial cropping systems at the COBS site.

“One of the penalties of an ecological education is that one lives alone in a world of wounds. Much of the damage inflicted on land is quite invisible to laymen.”

- Aldo Leopold

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. Wiedenhoft 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 economic 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.

NEW Evaluating perennial crop options for inclusion in agroforestry systems, 1 year

J. Jensen, Trees Forever, Fenton

Trees Forever will investigate landowner challenges and opportunities for converting ecologically sensitive areas from row-crop production to a perennial agroforestry crop. The project will result in a case-study guide for landowners that includes economic information and an assessment of threats to growing black walnuts, chestnuts, hazelnuts, aronia berries, elderberry and Christmas trees.

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

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.

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 vocational agriculture instructors.

Grazing prairie: Improving species diversity while maintaining cattle and goat productivity and resting home pastures, 4 years, extended

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 will be measured. Vegetation changes will be noted and plant inventories will be conducted.

Impacts of conventional and diversified rotation systems on crop yields, profitability, soil functions and environmental quality, 3 years, extended
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. Investigators have split the soybean and corn plots to allow side-by-side comparisons of genetically engineered and non-genetically engineered hybrids and varieties.

» **NEW Integrating project knowledge and models: The next step in developing a Payment for Ecosystem Services scheme for the Big Creek watershed, 1 year**

L. Schulte-Moore, J. Tyndall and T. Isenhardt, ISU natural resource ecology and management; J. Gordon Arbuckle, ISU sociology; K. Franz, ISU geological and atmospheric sciences; E. Heaton and M. Liebman, ISU agronomy; M. Helmers, ISU agricultural and biosystems engineering

The investigators will further the development of a pilot Payment for Ecosystem Services (PES) framework. Focusing on central Iowa, they will integrate data and knowledge from prior research in the Big Creek watershed in preparation for using an ecosystem services model called InVEST. Widely used outside of Iowa, this model is popular for its capacity to link providers (farmers, landowners) with beneficiaries (the public) by estimating the dollar value of multiple ecosystem services.

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. Helmers, 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 will identify related environmental factors.

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.

» **NEW Predicting long term cover crop impacts on soil quality using a cropping systems model, 1 year**

F. Miquez, S. Archontoulis and A. Basche, ISU agronomy

This project will monitor crops and soils at a corn-soybean field site with a winter rye cover crop to provide information for a process-based model, APSIM. The model is eventually expected to facilitate use of cover crops in Iowa by providing improved understanding of crop production/cover crop management under Iowa soil and climate conditions. The model's simulations will answer questions regarding the impact of cover crops on soil organic carbon, nitrogen availability, soil erosion, soil water dynamics, average yields and yields following extreme climate events.

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

T. Isenhardt 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, extended
D. B. Jaynes, USDA-ARS 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.

» **NEW Reconnecting riparian buffers with tile drainage: An emerging technology to reduce nitrate loss from croplands, 1 year**
T. Isenhart, ISU natural resource ecology and management;
D. Jaynes and T. Parkin, USDA-ARS National Laboratory for Agriculture and the Environment, Ames

Although Midwest riparian buffers effectively remove sediment and phosphorus, they do little for removing nitrate because most drainage bypasses the buffers in the tile pipes. Investigators will continue research on the efficacy of saturated buffers to address this problem at long-time Leopold-funded demonstration sites in the Bear Creek and South Skunk watersheds. They will quantify nitrate loss at both sites.

» **NEW Suitability of winter canola (*Brassica napus*) for enhancing summer annual crop rotations in Iowa, 1 year**
M. Wiedenhoeft, R. Martinez-Feria and A. Lenssen, ISU agronomy;
and T. Kaspar, USDA-ARS National Laboratory for Agriculture and the Environment, Ames

Growing winter canola after summer annual crops such as corn or soybean might improve grain production and soil management, but represents a challenge in the cooler climates of the Upper Midwest. Investigators will conduct field trials to test the viability and short-term profitability of incorporating winter canola into the corn-soybean rotation, either as a winter cover crop or as a third cash crop frost-seeded with red clover. They will examine the effect of seeding date on winter survival, calculate ground cover and track nitrogen uptake. They will compare the costs, income and risks of the alternative cropping systems with the conventional corn-soybean system.

Transitioning to ecologically functional production systems, 3 years, extended

K. Hofmocker, 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.

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 help 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.



Ph.D. candidate Michaleen Gerken conducts water quality measurements in forest understory.

“We shall never achieve harmony with the land, any more than we shall achieve absolute justice or liberty for people. In these higher aspirations the important thing is not to achieve but to strive.”

- Aldo Leopold



Matt Helmers leads tour of Neal Smith plots project for group from the Land Stewardship Project of Minnesota

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. Isenhart, 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.

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

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.

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.

“Our tools
are better
than we are,
and grow
better faster
than we
do. They
suffice to
crack the
atom, to
command
the tides, but
they do not
suffice for
the oldest
task in
human
history,
to live on
a piece of
land without
spoiling it.”

- Aldo Leopold

MARKETING AND FOOD SYSTEMS INITIATIVE

The Marketing and Food Systems Initiative funded five pre-proposals received from the Summer 2012 RFP. Four projects were renewed for a second year of funding, three were given extensions to complete their work and two were slated to end.

New Marketing Initiative grants – FY2013

Total amount awarded – \$116,324

Total number of projects – 5

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

D. Dettman, K. Enshayan, J. Grimm, M. Houser, L. Kuennen, J. Libbey 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.

NEW Development of an online food safety training for employees of university farms and school gardens, 1 year A. Shaw and C. Strohbehn, ISU Extension and Outreach; L. Naeve, ISU Value Added Agriculture Program

Investigators will develop two specialized online food safety educational modules and two user manuals to lower the risk of foodborne outbreaks at school gardens and university farms. They will conduct a mini-pilot project to evaluate the impact of the materials developed.

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.

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

This 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 Fostering healthy diets in children through vibrant school gardens, 1 year

H. Lewis, National Center for Appropriate Technology, Des Moines

This project seeks to foster the long-term sustainability of school gardens in the Des Moines area, with the long-term goal of creating a useful teaching tool and inspiring greater appreciation of fresh fruit and vegetables. Investigators will help six schools create “demonstration gardens” and will develop a Des Moines school garden network to facilitate collaboration and resource/information sharing.

NEW Implementing a seasonal cycle menu for public schools featuring Iowa-grown and processed foods, 1 year

T. Wiemerslage, ISU Extension and Outreach, Decorah

This project expands previous work to launch the Farm to School program in 18 school districts by creating a seasonal cycle menu for public schools. The menu will help public schools meet the requirements of the Healthy, Hunger Free Kids Act and provide a predictable demand for Iowa-grown and Iowa-processed foods to assist farmers in planning. Investigators also will train high school and middle school youth to teach and mentor younger students who are being introduced to new foods.

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.

NEW Innovative equipment solutions to reduce costs and improve productivity for small-scale fruit and vegetable growers, 1 year

G. Artz, ISU economics and L. Naeve, ISU Value Added Agriculture Program

This project will create awareness of equipment-sharing strategies that fruit and vegetable growers can use to enhance profitability and reduce risk when scaling up production. A pilot project with two groups of growers will evaluate possible models for sharing specialized equipment.

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

K. Enshayan, 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.

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 Recordkeeping education and insurance benchmarking for Iowa fruit and vegetable producers, 1 year

S. Worley, Practical Farmers of Iowa, Ames

Lack of suitable insurance has been a major barrier to the success of fruit and vegetable enterprises. Practical Farmers of Iowa will train 40 fruit and vegetable farms operators on how to keep detailed records. They will collect and compile records from 10 farms to create valuable baseline data on production and sales to distribute to stakeholders and insuring agencies interested in increasing insurance options.

Transitioning farmers to produce for wholesale markets, 2 years

M. Nordschow, 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.

POLICY INITIATIVE

The Policy Research Initiative funded one proposal received from the Summer 2012 RFP. One other grant continued for a second year of operation.

New Policy Initiative grants – FY2013

Total amount awarded – \$46,249

Total number of projects – 1

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 Sustainable Agricultural Land Tenure (SALT) and risk management for extreme climatic events, 1 year**
E. Cox, Drake University Agricultural Law Center, Des Moines
and J. Gordon Arbuckle, Jr., ISU sociology

After conducting interviews to determine the key land tenure issues related to climate changes, the investigators will develop outreach materials to offer landowners/farmers information on possible tenure arrangements that help protect the land from extreme climatic events while also altering practices that contribute to climate change. They will utilize their findings to formulate policy recommendations on leases, crop insurance and risk management strategies.

CROSS-CUTTING INITIATIVE

The Cross-Cutting Initiative funded three pre-proposals received from the Summer 2012 RFP. Another seven projects were renewed for a second or third year of funding or given extensions to complete their work.

New Cross-Cutting Initiative grants – FY2013

Total amount awarded – \$87,376

Total number of projects – 3

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 are developing 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.



Women landowners shown in SALT video

“Conservation
is a state
of harmony
between
men and
land.”
- Aldo Leopold

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 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 Cultivating conservation: Bringing ecology, economics and ethics together, 1 year

T. Papanicolaou, civil and environmental engineering, University of Iowa

This project will develop a holistic framework to help farmers and producers make good land stewardship decisions, based on ongoing research at the Clear Creek watershed in southeast Iowa. The framework will utilize quantitative metrics that account for ecological, economic and ethical aspects of decision-making. To do so, it will integrate an erosion-biogeochemical model with a cost-benefits analysis and a measure of quality of life. The model can then be used to evaluate hypothetical scenarios, assigning a monetary value to the benefits and consequences of different farming systems.

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 was erected at ISU’s Allee Demonstration Farm near Newell and operated for farrowing pigs.

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.



“Harmony with land is like harmony with a friend; you cannot cherish his right hand and chop off his left.”

-Aelcio Reupold

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.

NEW Impacts of conventional and diversified rotation systems on crop yields, profitability, soil functions and environmental quality: Stage II, 1 year

M. Liebman and M. Castellano, ISU agronomy; and A. Johanns, ISU Extension and Outreach, Mitchell County

This grant supports ongoing research at the ISU Marsden Farm concerning the agronomic, ecological and economic effects of diversifying crop rotations. The investigators will estimate soil erosion potential and make measurements of soil nitrogen-related processes. They will continue to quantify the economic characteristics of the low-input-high-diversity cropping rotations compared to the conventional corn-soybean system, and distribute results to farmers, ag professionals, scientists and policymakers.

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.

NEW Increasing visibility of energy conservation and renewable energy on Iowa's small to mid-sized farms, 1 year

C. Yates, UNI Center for Energy and Environmental Education

This grant supports the ongoing work of the Farm Energy Working Group (FEWG), facilitated through the University of Northern Iowa's Center for Energy and Environmental Education. FEWG will provide face-to-face meetings with working group participants, expand the visibility of the working group, offer two to three webinars on topics that will help farmers reduce reliance on fossil fuels and provide two mini-grants to help farmers demonstrate innovative approaches to reduce energy demands.

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.



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