2015

Leopold Center for Sustainable Agriculture, 2014–2015 Annual Report

Leopold Center for Sustainable Agriculture

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

Aldo Leopold
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.
A TIME OF ADJUSTMENT

We all have to try to live within our means, and it is no different for the Leopold Center for Sustainable Agriculture. We are committed to promoting sustainability for Iowa’s agriculture, but that also requires us to acknowledge the need for sustainability in our own operations.

The Center, from its inception in 1987, has had budget lines with legislated overhead limits. As we all know, a dollar today does not buy nearly as much as a dollar did 28 years ago when the Center was chartered by the Iowa Groundwater Protection Act. It was time to face the painful financial reality and develop plans to do something about the balance of overhead costs and program funding. In order for the Center to fulfill its primary mission of supporting research, education and outreach, more funds had to be reallocated to programming and less to overhead. To accomplish this task, hard decisions had to be made in terms of reducing staffing and modifying program priorities.

The Center never has had the resources to be all things to all people. The limits inherent in the existing structure have become very apparent in the three short years that I have served as Director. Limited funds always mean limited scope and more focused priorities. Prioritization decisions are never easy.

I have talked with members of the Center’s advisory board on several occasions about the need for financial adjustment. In order to provide for the Center’s future, I prepared an office reorganization plan to decrease expenditures on personnel, benefits and non-grant related activities. The plan required approval by the College of Agriculture and Life Sciences, ISU Extension and Outreach, and ISU administration officials, including the University Human Resources office.

Within allowable limitations on such matters, we have done our best to keep everyone informed. I acknowledge that not everyone is comfortable facing this financial reality nor with the decisions and priorities chosen. However, this is what is required to stabilize Center finances and ensure that the Leopold Center can fulfill its mission to Iowans for many years to come. Long live the Leopold Center!

Mark Rasmussen
Director
As a farmer, I am honored to serve on the Advisory Board for the Leopold Center for Sustainable Agriculture. Our discussions regarding the work of the center are creative and inventive, responsible and practical, and diverse and multi-layered. I am struck by how often the issues discussed around our board table with board members, staff members, industry experts, and other stakeholders resemble the discussions that take place on Iowa farms in the shops, in the barns, and around the kitchen table.

We weigh what new idea has a chance to make an immediate impact. We debate if a new approach will make a difference to the long-term system we operate under. What will work under extreme climate conditions that seem to become the new norm? What if farm commodity prices remain stagnant or fall further? How do we reach new markets? Will there be a place for new or beginning farmers? Can we do better with the resources we have already? And on and on the discussion goes.

The fact that these questions are asked both on the farm and around our board table makes me think that the Leopold Center is indeed tackling the relevant issues for sustainable agriculture in Iowa. This annual report reflects the depth of knowledge that has been developed and points to amazing innovations to come.

And this should be very clear as you read this annual report: Today, we can meaningfully address the challenges facing Iowa agriculture, as is our charge from the State of Iowa. But in my mind, the largest remaining questions for Iowa agriculture remain. Do we have the policy and market incentives in place to make a difference? Will we as Iowans take the lead in charting our own sustainable course or will we wait for legislative and judicial dictates to force us down a far more difficult road?

The tools are sharpened and lubricated, ready for us to use. Will we bother to take them out of the shed?

Aaron Heley Lehman
Leopold Center Advisory Board Chair, 2014-2015
Trees generally get pretty darn good PR, not just in modern times but throughout history. Sure, there are prettier plants, but most of them are shockingly short-lived compared to trees that can survive for centuries. Trees endure, despite seriously inhospitable conditions. They start out from a surprisingly small seed, and can ascend to amazing heights. There are references to the Tree of Life going back to the Egyptians, Sumerians and Mayans. Today the Tree of Life Web project is a collaborative effort of biologists and nature enthusiasts from around the world to map biodiversity. Even in Iowa where so many trees have been sacrificed to grow row crops, there are little towns that prize the maples or oaks that line their town squares and main streets.

This was something of a tree-centric year for the Leopold Center. The Ecology Initiative helped sponsor the 25th North American Agroforestry Conference. Agroforestry is a provocative blend of agriculture and forestry practices to help manage the land using sustainable techniques such as windbreaks, buffers, alley cropping and silvopasture. Trees Forever, an Iowa-based conservation group, honored the Leopold Center with a President’s Award for its work with the heralded Bear Creek riparian buffer project that included trees as a key component. One of the Center’s newest advisory board members, Jody Kerns, and her husband Jim, own and operate a 620-acre conservation farm, about half of which is managed woodlands. They have been honored as Iowa Tree Farmers of the Year and National Outstanding Tree Farmers.

The Leopold Center has funded some diverse tree-related projects over the years:

- Case studies on how to successfully grow hazelnut, black walnut, chestnut, and Christmas trees
- Use of poplar trees for buffer strips
- Orchard management strategies for apple tree growers
- How understory plant communities in forests and woodlands can improve water quality
- Potential of woody biomass to serve as a biofuel feedstock in Iowa
- How to jumpstart community-based efforts to deal with the dreaded emerald ash borer, which is cutting a destructive path through Iowa on its way across the nation

The Center’s guiding light Aldo Leopold was even part of some tree-related excitement. Director Mark Rasmussen obtained lumber from a tree felled at the Leopold family home in Burlington, Iowa. Chris Martin, an ISU art professor, and his woodworking class plan to use the salvaged wood to create some unique objects that will commemorate Leopold and his legacy. Meanwhile, Rasmussen does his work seated at a handsome wooden desk built at the Leopold family furniture factory. Longtime Leopold Center followers will recall that there is a flourishing chinkapin oak on ISU’s central campus, planted by the Leopold Center on Earth Day 1998 to commemorate the 50th anniversary of Aldo Leopold’s death.

That lovely oak is just one example of the many growing, thriving entities (not just trees) begun by the Leopold Center over the past 28 years. Every project or program the Center engages in represents a commitment to Iowa agriculture’s future. In the end (said Alexander Smith), “A man does not plant a tree for himself; he plants it for posterity.”

Mary Adams, Editor

Keep a green tree in your heart and perhaps a songbird will come. - Chinese proverb
2014-15
LEOPOLD CENTER ADVISORY BOARD

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

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

**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

**Gail Hickenbottom**, Practical Farmers of Iowa, West Des Moines*

**Maynard Hogberg**, Professor of Animal Science, Iowa State University*

**Erin Irish**, Professor of Biological Sciences, University of Iowa

**Susan Jutz**, Farmer, Practical Farmers of Iowa, Solon*

**Jody Kerns**, Farmer, State Soil Conservation Committee, Edgewood*

**Catherine Kling**, Professor of Economics, Iowa State University*

**Paul Lasley**, Professor of Rural Sociology, Iowa State University

**Aaron Heley Lehman**, Farmer, Iowa Farmers Union, Polk City (board chair)

**Marc Linderman**, Professor of Geography, University of Iowa

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

**Michael Naig**, Deputy Director, Iowa Department of Agriculture and Land Stewardship

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

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

**Keith Summerville**, Interim Dean, College of Arts and Sciences, and Associate Professor of Environmental Science and Policy, Drake University, Des Moines

*served part of the year only

2014-15
LEOPOLD CENTER PROFESSIONAL STAFF

**Mark Rasmussen**, Director (markras@iastate.edu)

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**Laura Miller**, Communications Specialist (lwmillier@iastate.edu)

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**Malcolm Robertson**, Cross-Cutting Initiative Coordination and Outreach (malcolmr@iastate.edu)*

**Heather Scott**, Administrative Specialist (hcscott@iastate.edu)* **

**Alice Topoloff**, Program Assistant (topoloff@iastate.edu)

**Kim Vo**, Administrative Specialist (kvo@iastate.edu)**

*part-time or shared appointment
** served part of the year
Former Center Directors Still Active

Even after stepping down from the directorship of the Leopold Center, three former leaders continue to be active in the sustainable agriculture community.

Jerry DeWitt, who was director from 2005 to 2010, received the 2015 NCR-SARE “Hero” award from the North Central Sustainable Agriculture Research and Education (SARE) Program. DeWitt served in several posts with the SARE organization during his 38-year stint at Iowa State University. DeWitt is only the second person to receive the award given by the NCR-SARE Alumni Organization to recognize and celebrate long-term leadership and contributions made in the 12-state northern region. He continues to play a prominent role in sustainable agriculture circles at his retirement home in North Carolina.

Dennis Keeney, the Center’s first director who served from 1988 to 1999, is the author of a thoughtful new memoir about growing up on a central Iowa farm and the subsequent journey that took him from Iowa State to the faculty at the University of Wisconsin-Madison to a corner office in Curtiss Hall in the founding years of the Center. Keeney’s book, *The Keeney Place: A Life in the Heartland*, weaves a tale of life on the land, studying the land and finally working to save the land from the ravages of erosion and pollution. The paperback book is available from Itasca Books at www.thekeeneyplace.

Fred Kirschenmann was honored with the creation of the Kirschenmann Lecture series at the Stone Barns Center for Food and Agriculture at Pocantico Hills, New York. (He has served as President of the Board of Directors at Stone Barns since 2008.) Noted author Wendell Berry presented the kickoff lecture on June 18. The lecture series will highlight the philosophical themes that have been the constant hallmarks of Kirschenmann’s career. He was director of the Leopold Center from 2000 to 2005, and is currently Distinguished Fellow at the Center.

A brotherhood of venerable trees.

- William Wordsworth
The “slow money” movement seeks to match locally produced and environmentally friendly food and artisanal products and services with fresh capital investment. The name stems from the “slow food” movement, an alternative to fast food and a promoter of using local ingredients. Priyanka Jayashankar, an adjunct assistant professor of management and a part-time Leopold Center researcher, has published a research paper about this financial tool that embraces environmental and social benefits in addition to monetary gains. The paper appeared online in the peer-reviewed academic journal *Ecological Economics*.

Investors following the slow money model embrace what she calls a “triple bottom line.” The slow money model generally entails a slower return on an investment, usually around seven years. She notes that slow money investors have helped existing farms make the transition to organic production and new farms to lease land.

Mark Rasmussen, Leopold Center director and a co-author of the paper, said slow money may provide a new model that could shape agriculture in the future. “As we continue to face the question of who will farm in the future, the Leopold Center is willing to explore a range of alternatives,” Rasmussen said. “The research in this paper is part of that exploration.”

The iconic Monarch butterfly is just one of many pollinators in trouble because of habitat destruction and climate change. The Leopold Center has joined with several other agencies and nonprofit groups to help Iowa’s pollinator population rebound. One group working on butterfly sustainability is the Monarch Conservation Consortium, headed by the ISU College of Agriculture and Life Sciences. The coalition of farmers, conservation groups, state agencies and ISU units aims to conserve Monarch butterfly habitat that promotes reproduction and survival. The Blank Park Zoo in Des Moines has launched a program designed to create awareness of the need for habitat for butterflies and other pollinators. The Leopold Center is one of 30 organizations participating in this effort.

Soil was a key element of Aldo Leopold’s vision of a healthy landscape. He would have applauded the designation of 2015 as the International Year of Soils by the Food and Agriculture Organization of the United Nations and its Global Soil Partnership. In the United States, the USDA’s Natural Resources Conservation Service and the Soil Science Society of America have been sharing information, resources and program notes on their work with soils. At the Leopold Center, where soil health has been a significant research topic since day one, the web page www.leopold.iastate.edu/year-of-soils includes essays and commentary on the soil, links to past Center-sponsored work on soil quality, and even some fun soil-related activities.
### FINANCES

for the years ended June 30, 2015 and 2014

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).

#### Funds Received

<table>
<thead>
<tr>
<th>Category</th>
<th>2015</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>State AMA Receipts</td>
<td>$1,922,390</td>
<td>$1,722,748</td>
</tr>
<tr>
<td>ISU Allocations</td>
<td>432,335</td>
<td>431,682</td>
</tr>
<tr>
<td>Foundation Funds</td>
<td>209,588</td>
<td>199,596</td>
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<tr>
<td>Staff Leveraged External Grants and Projects</td>
<td>54,678</td>
<td>108,973</td>
</tr>
<tr>
<td>Extension Funds</td>
<td>53,403</td>
<td>60,000</td>
</tr>
<tr>
<td>Incentive/Discretionary Accounts</td>
<td>182</td>
<td>365</td>
</tr>
<tr>
<td><strong>Total Funds Received</strong></td>
<td><strong>$2,672,576</strong></td>
<td><strong>$2,523,364</strong></td>
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</table>

#### Funds Expended

<table>
<thead>
<tr>
<th>Category</th>
<th>2015</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personnel</td>
<td>$816,531</td>
<td>$818,049</td>
</tr>
<tr>
<td>Operations</td>
<td>111,526</td>
<td>138,588</td>
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<tr>
<td>Competitive Grants &amp; Grant Infrastructure:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ecology Initiative</td>
<td>475,727</td>
<td>528,309</td>
</tr>
<tr>
<td>Policy Initiative</td>
<td>74,808</td>
<td>87,788</td>
</tr>
<tr>
<td>Marketing Initiative</td>
<td>252,953</td>
<td>250,448</td>
</tr>
<tr>
<td>Cross-Cutting Initiative</td>
<td>254,529</td>
<td>235,997</td>
</tr>
<tr>
<td>Special Commitments</td>
<td>0</td>
<td>26,500</td>
</tr>
<tr>
<td>Monthly Competitive Education Program</td>
<td>10,638</td>
<td>7,323</td>
</tr>
<tr>
<td><strong>Total Competitive Grants &amp; Grant Infrastructure</strong></td>
<td><strong>1,068,655</strong></td>
<td><strong>1,136,365</strong></td>
</tr>
<tr>
<td>Foundation Accounts</td>
<td>243,351</td>
<td>210,160</td>
</tr>
<tr>
<td>Staff Leveraged External Grants and Projects</td>
<td>105,041</td>
<td>122,431</td>
</tr>
<tr>
<td><strong>Total Funds Expended</strong></td>
<td><strong>$2,345,104</strong></td>
<td><strong>$2,425,593</strong></td>
</tr>
</tbody>
</table>

| Increase/(Decrease) in Funds                                 | 327,472       | 97,771        |

| Funds, Beginning of Year                                    | 1,658,636     | 1,560,865     |

| Funds, End of Year                                          | $1,986,108    | $1,658,636    |

#### Competitive Grants AWARDED by Initiative

<table>
<thead>
<tr>
<th>Initiative</th>
<th>FY2012</th>
<th>FY2013</th>
<th>FY2014</th>
<th>FY2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ecology</td>
<td>$150,246</td>
<td>$298,570</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Policy</td>
<td>84,500</td>
<td>56,121</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marketing</td>
<td>125,565</td>
<td>160,906</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cross-Cutting (XP)</td>
<td>151,310</td>
<td>216,220</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$511,621</strong></td>
<td><strong>$731,817</strong></td>
<td></td>
<td></td>
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</table>

#### Programs

<table>
<thead>
<tr>
<th>Category</th>
<th>FY2012</th>
<th>FY2013</th>
<th>FY2014</th>
<th>FY2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active Grants</td>
<td>71</td>
<td>81</td>
<td>114</td>
<td>98</td>
</tr>
<tr>
<td>New Grants</td>
<td>31</td>
<td>40</td>
<td>35</td>
<td>17</td>
</tr>
<tr>
<td>Number of Pre-proposals</td>
<td>74</td>
<td>54</td>
<td>48</td>
<td>56</td>
</tr>
<tr>
<td>Active Working Groups</td>
<td>13</td>
<td>10</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Iowa Counties with Active Projects</td>
<td>49</td>
<td>47</td>
<td>47</td>
<td>45</td>
</tr>
<tr>
<td>Principal Investigators</td>
<td>57</td>
<td>64</td>
<td>76</td>
<td>74</td>
</tr>
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</table>

#### Outreach

<table>
<thead>
<tr>
<th>Category</th>
<th>FY2012</th>
<th>FY2013</th>
<th>FY2014</th>
<th>FY2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Publications (Papers, Books, Etc.)</td>
<td>59</td>
<td>73</td>
<td>74</td>
<td>58</td>
</tr>
<tr>
<td>Website Unique Visitors (Monthly Average)</td>
<td>6,452*</td>
<td>6,483</td>
<td>7,043</td>
<td>7,250</td>
</tr>
<tr>
<td>Website Activity (Monthly Average)</td>
<td>19,800**</td>
<td>18,773</td>
<td>19,046</td>
<td>18,250</td>
</tr>
<tr>
<td>Educational Events</td>
<td>163</td>
<td>164</td>
<td>253</td>
<td>138</td>
</tr>
<tr>
<td>Reported Leveraged Funds by LC Projects</td>
<td>$1.82M</td>
<td>$5.18M</td>
<td>$5.71M</td>
<td>$5.3M</td>
</tr>
</tbody>
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#### Center Stats

<table>
<thead>
<tr>
<th>Category</th>
<th>FY2012</th>
<th>FY2013</th>
<th>FY2014</th>
<th>FY2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employees</td>
<td>10</td>
<td>13</td>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td>Interns/Students</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>3</td>
</tr>
</tbody>
</table>

* New website launch September 2012 with different web tracking system.
** Includes only average monthly page views for nine months under different tracking system.
The members of the selection committee for the 2014 Spencer Award for Sustainable Agriculture found themselves torn as they scanned the year’s 11 nominations for the award. Two top candidates emerged and both had many compelling reasons to be chosen. The committee opted to present a joint award to Leigh Adcock and Steve Berger, two Iowans who had followed different, albeit successful avenues in the quest for sustainability.

Leigh Adcock, former director of the Women, Food and Agriculture Network, was nominated by the WFAN board of directors in recognition of her achievements and service with their organization. During her time in charge of WFAN, the organization’s influence and membership expanded greatly (300 to over 5,000). The importance of women landowners (now holding 40+ percent of Iowa’s farmland) as part of the Iowa agricultural landscape made her organization’s efforts at education and advocacy for women critical to future conservation and sustainability progress. The WFAN “Women Caring for the Land” program reached more than 1,800 women in Iowa and has been expanded to seven other states.

Steve Berger, a large-scale family farmer from Wellman, has been a long-time, vocal advocate for the use of cover crops, no-till and buffer strips—and has adopted all three practices in his operations. Berger and his father have no-tilled for 35 years, built 14 miles of contour terraces and use cereal rye cover crops on all their acres. In addition to putting the practices to work, Berger operates as a goodwill ambassador and has hosted or presented at 66 events that educated farmers about no-till and cover crops. He was nominated by the coordinator of his local watershed, and letters of support came from Practical Farmers of Iowa, the National Sustainable Agriculture Coalition and the Iowa Soybean Association.

Appropriately enough, the two winners received their awards at the Iowa Water Conference on March 2, 2015. The joint awards were presented by Leopold Center Advisory Board member Bill Ehm, Administrator of the Environmental Services Division at the Iowa Department of Natural Resources.

2015 SHIVVERS LECTURER THRILLS LOCAL FOODIES

Nearly 600 people showed up to hear New York City celebrity chef Dan Barber deliver the annual Shivvers Lecture on April 8, 2015 at the ISU Memorial Union. It was the day after his book *The Third Plate: Field Notes on the Future of Food* appeared in paperback and a few weeks before he received his third James Beard Foundation Award.

But Barber’s message to the crowd wasn’t about how he manages two ultra-chic East Coast eateries. It was about his quest to find out what makes food delicious and nourishing. One of the people who influenced him on this thought journey was Fred Kirschenmann, Leopold Center Distinguished Fellow. From his conversations with Kirschenmann and other organic farmers, Barber learned much more about how they use an assortment of crops in rotation to keep the soil healthy and produce those tasty crops he enjoyed serving in his restaurants. One of the key messages in *The Third Plate* is that sustainable cuisines historically used all products from a region and Barber is always searching for new, innovative ways to use local products.

Barber was an early and passionate proponent of the farm-to-table movement that trumpeted the use of local foodstuffs grown sustainably. He says that “eating from the whole farm” is a concept that needs to be adopted by the local foods movement—which means figuring out tasty ways (such as his Rotation Risotto) to use all the products the farmer needs to raise to ensure soil health and sustainability in the future.

Dan Barber is the co-owner and executive chef of Manhattan’s Blue Hill restaurant. He also is a board member at the nonprofit Stone Barns Center for Food and Agriculture, home of his sister Blue Hill restaurant. Both locations of his Blue Hill restaurants have received Beard Awards as “Outstanding Restaurant” in the nation and Barber was named as the nation's Best Chef in 2009.

A podcast of his lecture is available at www.leopold.iastate.edu/2015-Shivvers-Lecture
Evaluating Some Leopold Center Success Stories

Looking forward is good, but sometimes looking backward also yields worthwhile insights. Leopold Center evaluators Corry Bregendahl and Arlene Enderton routinely scrutinize project results to determine the long-term outcomes and impacts. Here are a couple of successful projects with Leopold Center sponsorship that were examined this past year.

MarketMaker

In 2005, Iowa State Extension’s Value Added Agriculture Program received a $25,000 competitive grant from the Leopold Center to purchase data and create the Iowa version of the MarketMaker website. The MarketMaker database consolidates food industry information, including the locations of a variety of food businesses—such as farms, wholesalers, restaurants and grocers. Available free of charge to the public, visitors to the website can use MarketMaker as a directory to find producers and products. (See www.marketmakeriowa.com.)

A decade later, The Iowa MarketMaker website lists more than 15,000 Iowa food businesses, including 486 producers, and is helping these businesses connect with one another and gain new markets for their products. The online database has especially benefitted farmers selling through non-commodity channels. Nearly 87 percent of the farms registered on MarketMaker’s national 19-state network sell their products directly to consumers and wholesalers. These farms have each been contacted an average of 2.9 times by customers or other food businesses that found them on the MarketMaker site.

While MarketMaker encourages connections between food businesses all over the United States, it also has local applications. Value Added Agriculture is collaborating with the Regional Food Systems Working Group (RFSWG), a network of 13 Iowa local food groups, to register food businesses in their region with MarketMaker. The Value Added Agriculture Program also is creating MarketMaker widgets for RFSWG websites, which will allow users to search for food businesses in their RFSWG region.

Helping Iowa horticulture producers

In just four years at Iowa State University, assistant horticulture professor Ajay Nair has created a thriving, vibrant sustainable vegetable production research and education program. Building on his research in cover crops, he and colleagues recently received a USDA Sustainable Agriculture Research and Education (SARE) grant to test a hypothesis that a terminated cover crop can act as a barrier and maybe even suppress Listeria that can contaminate a growing melon crop.

“From my first day here, I realized the importance of sustainable practices in vegetable production. I was excited about the opportunity to work with growers and show them how they could reduce their environmental impact while still maintaining profitability. I think this project will help growers understand how to implement sustainable practices in a way that works for them.”

“When I moved to Iowa there was a big push in the area of local food production and I could see a lot of fruit and vegetable growers getting into the business,” he said. Enthusiasm for vegetable production was high and growers of all sizes were experimenting with a variety of production practices. It was the perfect time for ISU to help expand research and education on sustainable vegetable production. When he first arrived at ISU, Nair met with Leopold Center staff including Craig Chase who leads the Marketing and Food Systems Initiative, to identify priority areas for these producers.

The Leopold Center shares Nair’s passion for sustainable production systems. Therefore, when Nair arrived, the Center’s funding helped him assemble the essential elements to establish his research program: a laboratory, graduate students, and connections with colleagues. Financial support of $50,000 for his research and academic activities was provided from 2011 through 2014. Today Nair’s research focuses on several sustainable practices: cover crops, strip tillage, biochar, high tunnels and crop diversification.
Center Program Supports Events Around the State

Have a conference, special speaker or unique artistic presentation related to sustainability? The Leopold Center has a financial assistance program—the Competitive Educational Support Program (CESP)—to support Iowa-based events with potential to enhance sustainable thinking and practices. Up to $1,000 is available for one-time educational events, programs, workshops, conferences or displays. (See details at www.leopold.iastate.edu/grants/education.) The program is managed by communications specialist Laura Miller with guidance from a review committee.

Here are the events that the Center assisted in staging during FY2015:

**July 2014**
Practical Farmers of Iowa, $1,000, to support the premiere in West Branch and subsequent performances (in Decorah, Chariton, Red Oak and Ames) of Map of My Kingdom, a play on farmland transfer written by Iowa Poet Laureate Mary Swander.

Seed Savers Exchange, Decorah, $1,000, to fund eight scholarships for beginning farmers to attend the 34th Annual Seed Savers Exchange Conference. The conference featured workshops on seed-saving and sharing; the keynote speaker discussed plant breeding for stress-prone environments and a changing climate.

**September 2014**
Story County Conservation Board, $500, to host the Local Food Cycle, a 40-mile bike ride to highlight local food and seven Story County farms. The ride had 120 participants and involved six local chefs.

Horizons Family Alliance, $488, for a Healthy Horizons Harvest Party at NewBo City Market in Cedar Rapids attended by more than 200 people. The Alliance hosts a community garden in a low-resource neighborhood in Cedar Rapids and works with Feed Iowa First to provide excess produce used in the local Meals On Wheels program.
ISU Agronomy Department, $1,000, to support the Pesek-Pierre Colloquium on Sustainable Agriculture in Ames. Speakers were Kate Scow, University of California-Davis soil microbiologist, and filmmaker (Symphony of the Soil ) Deborah Koons Garcia. www.leopold.iastate.edu/2014-pesek-pierre-colloquium

October 2014
Iowa Environmental Council, $500, to support their annual conference at Drake University in Des Moines. The program focused on unique consequences and potential solutions to reducing agricultural runoff that contributes to high levels of nitrogen and phosphorus in sources of Iowa drinking water.

November 2014
ISU Graduate Program in Sustainable Agriculture, $500, for support of a visit by agricultural economist John Ikerd (Professor Emeritus, University of Missouri-Columbia). He met with two graduate-level sustainable agriculture classes to discuss his FAO-commissioned report on the status of North American family farms.

Women, Food and Agriculture Network, $1,000, for their Midwestern conference in Fairfield with more than 200 attendees and 40 sponsors. The conference featured workshops on soil health, grassroots science and preserving and expanding no-GMO food choices and local foods from area farmers.

January 2015
Benton County Extension, $500, to support the Driftless Region Beef Conference in Dubuque attended by 66 people.

March 2015
Iowa Stormwater Education Program, $500, for the Iowa Water Conference at ISU. The funds supported a keynote presentation and workshop on the City of Portland’s green infrastructure for stormwater management. www.leopold.iastate.edu/2015-iowa-water-conference

Luther College biology and theatre departments, $1,000. The grant supported interviews and videography of farmers and community members in the Dry Run Creek Watershed regarding water quality challenges and solutions. The materials were used for four multi-media dance performances of “Body of Water.” The sold-out performances reached about 700 people and a documentary is being prepared about the project.

North America Aronia Cooperative, $250, to support the berry growers group’s first annual conference at ISU in Ames.

Sustainable Agriculture Student Association, $1,000, for an ISU lecture by Vandana Shiva, an internationally known speaker on biodiversity, seed-saving and small farmer rights. www.leopold.iastate.edu/vandana-shiva

April 2015
ISU Student Organization of Sociologists, $300, to host an Iowa State lecture on food justice by Philip McMichael from Cornell University. www.leopold.iastate.edu/2015-food-justice

May 2015
Iowa Valley Resource, Conservation and Development, $500, to support the Third Annual Food Film Festival in Toledo hosted by the Meskwaki Food Sovereignty Initiative of the Fox and Sac Nation. About 40 community members attended the festival featuring five food-related films.

June 2015
Johnson County Soil and Water Conservation District, $600, to host 22 women from four counties at a workshop for female landowners about issues related to farm transfer and transition.

Nahant Marsh Education Center of Davenport, $500, to support the Quad Cities Pollinator Conference in Rock Island, Illinois, attended by 275 people from eight states and two Native American tribes. Videos from the conference are archived at: www.qcppollinatorconference.org.
The Graduate Program in Sustainable Agriculture (GPSA) has received support from the Leopold Center since it was established at ISU in 2003. Mary Wiedenhoeft of the ISU agronomy department continued to act as the faculty administrator for the program in fiscal year 2015, with Angela Stone serving as program coordinator.

In FY2015 Leopold Center financial assistance funded portions of six GPSA research assistantships. The recipients of those awards describe their work:

**Hannah Dankbar**
MS/MCRP in Community and Regional Planning
As a Graduate Research Assistant in Community and Regional Planning, I assisted Gary Taylor with projects for Iowa State Extension and Outreach. Some of these projects include: writing for the Blog for Land Use and Zoning (MidWest Planning BLUZ), adding videos to a flood insurance website and creating materials to aid in the professional development of land use planners in the state. I will continue to work with Taylor on Extension projects this coming academic year.

**Dana Jokela**
MS in Horticulture
I completed the first year of my experiment looking at no-till and strip-till production of organic broccoli and bell pepper. First-year results show that it is possible to achieve equal yields of bell pepper using reduced tillage production methods, though this did not hold true for broccoli. One of the more noteworthy results among the other data collected for this project was that nitrate leaching was significantly lower in the no-till and strip-till plots, suggesting that this system could be an important part of the statewide initiative to reduce nitrate entering surface and groundwater. I presented these results at several conferences in 2014-15, including the Great Plains Grower’s Conference, the MOSES Organic Farming Conference, and at the annual conference of the American Society of Horticultural Science (ASHS). We also discussed the project at several field days in Ames and at a grower-collaborator’s farm in Grinnell. In addition to my main thesis research, I carried out a pilot study to see whether we could use summer cover crops in conjunction with no-till planting of garlic in the fall.

**Elizabeth Kersey**
PhD in Anthropology
My research explores seed saving by gardeners as a mechanism for promoting resilient household food systems, for understanding seed saving’s meaning for gardeners who save seed and to identify its role as *in situ* conversation. Two specific research questions evolved from this work: (1) What are the cultural, historical, personal and practical reasons people cite for saving seed? (2) To what extent does seed saving strengthen an individual/household’s food systems resiliency to climate change?
I hope that my research will lead to discussion with seed savers of questions such as: Is seed saving an activity that spills over into other conservation-oriented or self-provisioning activities? To what extent are gardeners who save seed favoring characteristics tied to noticeable attributes of climate change? Does this become a source of locally adapted seed? Does seed saving promote increased climate-resilient household food systems? What draws individuals to seed saving and what are the barriers to their involvement at differing stages? Preliminary research includes contacting Seed Savers (in Decorah, Iowa) and other seed saving networks. I am developing contacts and anticipate conducting interviews next year.

**Eric Britt Moore · PhD in Agronomy**

My research explores interactions between soil structure, soil organic matter and plant-available water in fields that have long-term winter rye cover crop treatments. This research aims to better determine the influence that cover crop plant biomass additions and year-round root growth have in increasing plant-available water through detailed soil water tension measurements. These measurements, along with soil texture and organic matter data, will compare soils that have been in winter rye cover crops for 14+ consecutive years and those that have never had a winter cover crop. Data gleaned from this study will provide additional information on the role of winter cover crops in increasing resilience to climate variability and in the sustainable intensification of Iowa cropping systems.

**Marcie Stevenson · MS in Economics**

My current research aims to help determine entrepreneurship’s role on Iowa agriculture. I have compared entry and exit rates of firms for all Iowa firms versus Iowa agricultural firms. Also, I have separated the agricultural industry into different sectors to analyze their trends for entry and exit. Digging deeper, I analyzed the longevity of start-up firms between the two categories. In order to help understand what causes a firm to fail, I have run survival analysis regressions determining probability of business failure based on its firm size, location (whether or not it is adjacent to a metro area) and the population base of the firm’s location (metro, urban or rural). A similar analysis was done to see if the degree of significance for each variable tested changes due to being an agricultural firm and the sector of the agricultural industry in which the firm participates. To deepen my understanding of entrepreneurship and firm survival, I also have begun to evaluate the success of government grants for agricultural start-up firms and their effects on firms’ survival.

**Marie Louise Ryan · MS/MCRP in Community and Regional Planning**

Last summer I laid the foundation for spending a year in Nepal researching gendered barriers to rice diversity in Nepal’s marketplaces. By identifying the choke points of diversity in the rice supply chain, I hope to determine whether markets can be used as a promotional tool for Nepal’s traditional rice varieties while empowering women to take the lead in agrobiodiversity conservation initiatives.

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_I like trees because they seem more resigned to the way they have to live than other things do._ —Willie Cather
Water Rocks!
Water Rocks! experienced another successful year, thanks in part to Leopold Center funding. In 2014, Water Rocks! engaged more than 15,000 learners at 122 community and youth events, which included all 11 days at the 2014 Iowa State Fair. Iowans of all ages learned about conservation practices both urban and rural, water quality, watersheds, and wetlands. Events and attendees for 2015 are 24 percent above last year as of June 2015.

Water Rocks! hosted two teacher Summits in June 2015 for 53 Iowa K-12 teachers and high school students. At the Summits, they participated in activities, lectures and discussions, culminating with a field trip to see several conservation practices at work on Iowa farmland.

Water Rocks! took home 29 awards at the annual Iowa Motion Picture Association awards ceremony held in May. The videos can be seen on the Water Rocks! website (http://waterrocks.org/), YouTube and TeacherTube.

Iowa Learning Farms
Iowa Learning Farms (ILF) celebrated 10 years of operation in 2014. At the end of the year, ILF surveyed farmers and landowners across Iowa to capture their thoughts on how effective the program has been over the last decade.

Survey results found that farmers look to ILF for trusted information on conservation practices. Those who have attended at least one ILF field day are conservation-minded and have adopted numerous practices on their land. These farmers and landowners also are advocates for conservation, extending ILF's influence to 65 percent more farmers beyond those attending an ILF field day; and many networked with at least two of their peers about practices such as cover crops and reduced tillage.


In 2014, ILF held 25 field days and workshops for farmers and landowners with over 1,000 in attendance. Over the last decade, ILF has hosted 151 farmer-centered events that attracted 8,158 attendees. ILF continues to hold educational events for farmers across the state, with 10 field days and workshops held between January and June 2015.

Iowa Learning Farms serves as a leading voice in the state on cover crop research, outreach and education. Under ILF leadership and with help from Leopold Center, the Iowa Cover Crop Working Group has the longest running on-farm winter rye cover crop project in Iowa. Reports from the project are available on the ILF website.

The “Conservation Chat” podcast began in 2015. Jacqueline Comito, program director for the Iowa Learning Farms, interviews farmers and agricultural leaders about conservation and agriculture. Iowa Secretary of Agriculture Bill Northey was the inaugural guest for the series. Other episodes included talks with ILF farmer partners and agriculture experts including Leopold Center Director Mark Rasmussen. The podcasts are available at www.conservationchat.org.

ILF and WR! program director receives honor
Jacqueline Comito received the National Wetlands Award in May 2015 from the Environmental Law Institute, Washington, D.C. She was one of seven recipients across the country honored for exceptional and innovative contributions to wetlands.

ILF and WR! partners include the Leopold Center, Iowa State University Extension and Outreach, Iowa Department of Agriculture and Land Stewardship, Iowa Department of Natural Resources (Section 319 of the Clean Water Act), Natural Resources Conservation Service, Conservation Districts of Iowa, Iowa Farm Bureau, Practical Farmers of Iowa, and the Iowa Water Center.
LEOPOLD CENTER FUNDS CROPPING STUDIES BY WALLACE CHAIR FOR SUSTAINABLE AGRICULTURE

The Henry A. Wallace Chair for Sustainable Agriculture at Iowa State University is currently held by ISU agronomy professor Matt Liebman. His research, teaching and outreach activities focus on ways to increase soil, water and wildlife conservation in farming systems, while reducing dependence on agrichemicals and fossil fuels. Liebman’s specific interests include comparisons of different crop rotation and crop management systems; weed ecology; and the use of native prairie species as components of conservation buffer strips and as feedstocks for biofuel production.

Liebman participates in teams that are actively studying three cropping systems in central Iowa, all of which have benefitted from long-standing Leopold Center support: the Marsden Farm rotation experiment (for which he serves as team leader), the Science-based Trials of Row-crops Integrated with Prairie Strips (STRIPS) experiment, and the Comparison of Biofuel Systems (COBS) experiment.

Funding from the Leopold Center during FY2015 primarily contributed to the support of graduate student Julie Mueller, who is pursuing an M.S. degree in Sustainable Agriculture and Agronomy (Soil Science). Some of the funds were used to cover a portion of her salary (stipend), benefits and tuition. Mueller began her graduate studies at ISU in 2012. Her research is based at the Neal Smith National Wildlife Refuge near Prairie City, and is a part of the STRIPS project (www.prairiestrips.org and www.leopold.iastate.edu/strips-research-team) located on the refuge. Mueller’s thesis work has focused on measurements of soil properties, including microbial biomass, bulk density, and water infiltration rate, within prairie conservation strips and adjacent cropland.

Funds from the Leopold Center supported research projects led by Liebman whose Wallace Chair office annually receives $20,000 of support from the Center. The funding is secured under an agreement signed in 1997 when the endowed chair was created.
PROMOTES PATH OF SCIENCE TO PRACTICES

“Research into action” captures the essence of the Center’s Ecology Initiative activities over the past year. Bookmarked by two major conference/outreach events, robust research on topics ranging from cropping system diversity to water quality was packed into the intervening months. The Ecology Initiative, coordinated by Jeri Neal, supported a variety of enterprises beyond the extensive competitive grants programming.

Energy and Environment Summit
The first big event of the year was the multi-state 2014 Extension Energy and Environment (E3) Summit. It featured a number of Leopold researchers and projects and was chaired by ISU BioEconomy Institute Program Director Jill Euken and co-chaired by Ecology leader Neal. The conference highlight undoubtedly was the premiere screening of “STRIPS – the Movie.” (STRIPS is the acronym for Science-Based Trials of Row-crops Integrated with Prairie Strips.) The 13-minute film introduced audiences to a new conservation practice (the strategic addition of a small amount of prairie back into agricultural landscapes) that is garnering great interest both in and outside of Iowa.

The showing was followed by an open panel discussion with the Iowa State University research team about the practice and its potential to generate considerable benefits in water and soil quality, create habitat for wildlife and pollinators, and open up opportunities for biomass production. The film, ‘Restoring the Balance: Prairie Conservation STRIPS,’ along with several outtakes, can be viewed at www.leopold.iastate.edu/stripsthemovie. STRIPS project progress is reported at www.prairiestrips.org.

Prairies
During the year, completed Ecology Initiative research findings provided more scientific basis for “re-imagining” an agriculture that will do a better job of improving the water, soil and biological health that are critical for continued feed, food and fuel production in agriculture. For example, if we introduce prairie into Midwest corn and soybean-dominated landscapes, how might the prairie be impacted by existing practices? How do we determine economic value?

For the first case, a researcher looked at atmospheric nitrogen deposition and developed the infrastructure and baseline data to study the effect of chronic, low-level nitrogen additions in grassland ecosystems, such as tall grass prairie.

For the second example, investigators compared different methods of calculating the crop ‘fuel yields’ use to estimate economic values of prairie for cellulosic energy. They compared carbohydrate calculation methods and found that if the goal is estimating potential ethanol yields per unit land area, it’s acceptable to use constant values from literature or standard methods of estimation. However, if the goal is generating real numbers on biomass ethanol conversions, more rigorous methodologies need to be used.

Third crops
Even if it’s not pure prairie, getting more living “roots in the ground” for more of year is of great interest in Ecology Initiative research. Canola is a ‘third crop’ with potential both as a cash crop (oilseed) and cover
Researchers found that canola shows tremendous promise for reducing soil erosion and the leaching of nutrients into the water. They determined best planting date windows, and recorded winter hardiness and yields of winter and spring canola varieties.

Another Ecology grant explored the challenges and opportunities, including financial returns and barriers to wider adoption and marketing channels, for six different perennial crops that can be used in agroforestry practices. Crops investigated were aronia berry, black walnut, chestnut, Christmas trees, elderberry and hazelnut. The project showed that several of these crops can generate per acre returns greater than row crops over a projected 20-year time frame, although risk is generally higher.

**Water quality**
The quality of water exiting crop fields remains a potent issue statewide. Current surface inlet designs for tiling in fields allow water with high concentrations of sediment, sediment-bound phosphorus, and dissolved phosphorus to enter the landscape’s drainage systems. Researchers showed that blind inlets and filter socks amended with alum can reduce these problems, but a determination of the best practice to use must be site-specific.

Water quality also can be influenced by field applications of animal manures. Another research project provided an assessment of the availability of phosphorus in beef cattle manure for use by crops, updating older manure application guidelines. For beef cattle producers, grazing to improve pasture productivity, biodiversity and grassland wildlife habitat is thought to be possible by using a practice called mob-grazing. Research found that a single mob-grazing event on previously un-grazed ground showed the most success at reaching these goals.

**Agroforestry**
The 14th North American Agroforestry Conference, “Agroforestry as a Catalyst for On-Farm Conservation and Diversification,” was held in Ames in June 2015. Attendees on a pre-conference tour had a chance to view a variety of central Iowa agroforestry systems including riparian forest buffers, windbreaks, and specialty forest products. An advanced pre-conference agroforestry workshop focused on examples of people actively engaged in agroforestry in the United States and Canada and included discussion of constraints, opportunities and challenges of different agroforestry enterprises.

Ecology leader Neal helped facilitate the conference with event host ISU, several Iowa partners (including Trees Forever and private landowners) with multiple out-of-state partners through the Mid-American Agroforestry Working Group.

Extensive communications efforts and working groups were the most important elements of the ‘research into action’ agenda for the year. Among other Ecology Initiative activities, the Landscape Biomass team closed, and a new collaboration began with the Midwest Conservation Biomass Alliance.

**Ecology special projects**

**New**
“Does long-term use of cover crops affect soil health and quality as measured by the Haney Soil Test?” A lack of perceptible change to soil properties in soils under cover crop might be related to the choice of soil test. Seven farmers in a long-term cover-crop study are participating in a trial using the Haney test, a novel soil test that assesses soil microbial activity (soil health) and soil carbon, nitrogen and organic matter concentration (soil quality). PIs are S. Carlson, Midwest Cover Crops Research Coordinator and S. Gailans, Practical Farmers of Iowa.

**Completed**
“Simple and Fast Detection of E. coli in Agricultural Water Sources and Runoff” Researchers were attempting to advance water quality monitoring with development of a low-cost, paper-based device for detecting water-borne pathogen indicators (such as E. coli). They accomplished the first step to show that bacteriophages and chemicals can separately detect bacteria on paper. They will use that data as leverage for new funds to combine the two processes in a simple test. R. Cademartiri, ISU chemical and biological engineering and materials science and engineering and M. Soupir, ISU agricultural and biosystems engineering, conducted the project.
The Marketing and Food Systems Initiative (MFSI) was directed by Craig Chase with support from the nimble and enthusiastic Local Foods Team of Corry Bregendahl, Arlene Enderton, Lynn Heuss, Ahna Kruzic, Courtney Long, Savanna Lyons and Alice Topaloff.

Among the key efforts during the year were working in tandem with the initiative’s competitive grants program; developing and administering mini-grants; creating professional development and collaborative opportunities for the Regional Food Systems Working Group (RFSWG), the Iowa Food System Working Group (IFSWG), the Iowa Food Hub Managers Working Group (IFHMWG) and the Food Access and Health Collaborative (FAHC); and further connecting local citizens and organizations through small grant projects and outreach.

The Local Foods Team developed a strategic plan for engaging in successful local foods work in Iowa. Their plan identified four core areas that will be emphasized over the next one to three years: beginning farmers (curriculum development, incubator farms, mentor programs, prison farms); community development (community capacity building, agricultural urbanism toolkit, food health and access, farm to school programming, FoodCorps); economic development (food processing, food hub business development, farmer profitability); and evaluation (conducting evaluations and evaluation capacity building). The marketing initiative funded competitive grant projects in each of the four core areas during the past year.

MFSI mini-grant
One non-competitive mini-grant was approved in FY2015. Healthy Harvest of North Iowa requested funds to develop a producer survey to assess producer capacity, develop an inventory of on-farm structures, and interest in food aggregation efforts. The one-year grant request was for just over $4,000.

Memberships and sponsorships
Since 2013, the Leopold Center has been an active member of the Sustainable Agriculture Food Systems Funders (SAFSF). The group is “an international network of grantmakers that works to foster communication, shared learning and information exchange about issues connected to sustainable agriculture and food systems.” Craig Chase has served on several planning committees since 2013 and Corry Bregendahl has presented at one of the annual conferences. Because of the relationships built through these activities, the Local Foods Team has received more than $100,000 in grants from other SAFSF members.

The LCSA became a sponsor for the *Journal of Agriculture, Food Systems and Community Development* (JAFSCD) in 2013. According to the organizers: “The Food Systems Journal was founded in 2010 to fill the gap in the applied research literature on farming and food systems-based community development, such as regional food value chains, urban food systems, farmland protection, and food sovereignty. The journal focuses on public policy, research, and practice in food systems work, and emphasizes ‘accessible scholarship’ that maximizes its usefulness in the transdisciplinary field of food systems.”

The North American Food System Network (NAFSN) is closely connected to JAFSCD. NAFSN is intended to serve as a professional development network and provide a training platform and/or certification process for local food system practitioners. The Leopold Center and ISU Extension and Outreach are working with NAFSN to further development of a national certification program.
As part of the JAFSCD sponsorship package, MFSI is eligible for sponsorship advertising and guest editorial space (Corry Bregendahl provided an editorial). Along with this collaboration with NAFSN come opportunities to connect with a wide variety of people engaged in similar work to MFSI.

**New publications and cool tools**
The Local Foods Team prepared numerous publications to support professional staff and members of the public in promoting local food production and sales in Iowa. All are readily available on the Leopold Center website.

- **Local Food System Toolkit #2: Managing Cash Flow for a Low-Capital Food Hub Start-up**
  This toolkit explains the concept of cash flow and how food hub managers can use it to their advantage.
  [www.leopold.iastate.edu/low-capital-food-hub-startup](http://www.leopold.iastate.edu/low-capital-food-hub-startup)

- **Iowa CSA Farms**
  This directory lists 88 community supported agriculture (CSA) enterprises serving Iowa.
  [www.leopold.iastate.edu/2015-iowa-csa-farms](http://www.leopold.iastate.edu/2015-iowa-csa-farms)

- **Food Hub Development in Iowa**
  This is the first coordinated study of food hub development in Iowa.

- **Supporting Local Food System Development in Your Community**
  This toolkit offers guidance in helping organize and promote the development of a local food system in your community.
  [www.leopold.iastate.edu/supporting-local-food-development](http://www.leopold.iastate.edu/supporting-local-food-development)

- **2014 Local Food Champions**
  Here are nine profiles of local food champions who support development of local food systems in Iowa.

- **Best Practices of the Regional Food Systems Working Group**
  This document from the Regional Food Systems Working Group outlines some of the best practices for developing a local food system.
  [www.leopold.iastate.edu/BestPractices-RFSWG](http://www.leopold.iastate.edu/BestPractices-RFSWG)

- **2013 Economic Impacts of Iowa’s Regional Food Systems Working Group**
  This report offers a two-year look at the statewide impact of the local foods sector on Iowa’s economy, based on the efforts of the Regional Food Systems Working Group.
  [www.leopold.iastate.edu/2013-Economic-Impacts-RFSWG](http://www.leopold.iastate.edu/2013-Economic-Impacts-RFSWG)

- **Impact Brief: 2013 Economic Impacts of Iowa’s Regional Food Systems Working Group**
  This is a summary of the larger report: 2013 Economic Impacts of Iowa’s Regional Food Systems Working Group.
  [www.leopold.iastate.edu/2013-Economic-Impacts-RFSWG-brief](http://www.leopold.iastate.edu/2013-Economic-Impacts-RFSWG-brief)

- **Funding Opportunities in Local Foods**
  This compilation presents information about federal, state and private grant programs available as funding sources for development of local food systems.
  [www.leopold.iastate.edu/funding-opportunities-in-local-foods](http://www.leopold.iastate.edu/funding-opportunities-in-local-foods)

- **Shared-use Kitchen Planning Toolkit**
  This toolkit offers guidance in starting a shared-use kitchen for new and existing value-added food production entrepreneurs, farmers and caterers.
  [www.leopold.iastate.edu/shared-use-kitchen-toolkit](http://www.leopold.iastate.edu/shared-use-kitchen-toolkit)

- **Local Food Coordinators**
  This publication provides resources for development of a local foods coordinator position, complete with a position description.
  [www.leopold.iastate.edu/local-food-coordinators](http://www.leopold.iastate.edu/local-food-coordinators)

- **Local Food System Toolkit 1: Developing a Worksite Food Box Program**
  This toolkit provides guidance for creating a program of pre-packed food boxes delivered weekly and picked up by employees at their workplaces.
  [www.leopold.iastate.edu/worksite-toolkit](http://www.leopold.iastate.edu/worksite-toolkit)

- **Production Planning for Aggregators**
  This guide is designed for aggregators—businesses and organizations that create a single sales outlet through which large-volume buyers can purchase products from several local farmers.
  [www.leopold.iastate.edu/production-planning-aggregators](http://www.leopold.iastate.edu/production-planning-aggregators)

- **Machinery Sharing Manual for Fruit and Vegetable Growers**
  This manual discusses operational and organizational issues related to sharing farm machinery for fruit and vegetable production.
  [www.leopold.iastate.edu/machinery-sharing-manual](http://www.leopold.iastate.edu/machinery-sharing-manual)

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Woodman, spare that tree! Touch not a single bough!
In youth it sheltered me, and I'll protect it now.
- George Pope Morriss
The Leopold Center’s Policy Initiative supports 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, but does no public advocacy or promotion of specific policy alternatives. Initiative activities were managed by Mary Adams, outreach and policy coordinator.

**Sustainable Agricultural Land Tenure (SALT) Initiative**
The Sustainable Agricultural Land Tenure (SALT) Initiative is a long-running joint project of the Leopold Center and the Drake Agricultural Law Center in Des Moines. SALT uses a variety of tactics to educate landowners, farmers, their advisors and policy makers on sustainable land tenure arrangements and conducts research on developing land tenure issues that affect Iowa’s sustainability and resilience. Leopold Center support has been provided through previous strategic investments, competitive grants and Policy Initiative infrastructure funds.

**Impact of extreme climate events on land tenure arrangements**
Sociologist Jean Eells completed 18 interviews with farmers and landowners to learn how their land tenure arrangements have been affected and whether there are any efforts to use tenure arrangements to mitigate the impact of extreme weather events. Drake Law graduate Ellen Essman researched the role of public policy – in particular, crop insurance – in mitigating the negative impact of climate extremes.

**The legal rights and duties of entity ownership of Iowa farm land and the next generation of landowners**
Drake staff worked with the Allamakee County Watershed Coordinator, Sara Berges, to conduct interviews with four farmers to develop “legacy plans,” which provide a brief history of the land use for the farmer’s land, information and maps describing potential conservation concerns for the land, the farmer’s wishes and advice for the land when owned by family members who are unlikely to farm the land themselves. The report appears at [http://allamakeeswcd.org/farm-legacy-report/](http://allamakeeswcd.org/farm-legacy-report/).

The Drake Ag Law Center hosted an April 2015 gathering of 25 invited participants who discussed family disputes, multi-entity business structures, tax and estate planning, trust management, legal ethics and more. Participants, mainly attorneys, shared their experiences and identified the key issues in Iowa, discussed the range of legal questions being presented and their implications for farm families, and suggested possible solutions.

**Outreach**
Outreach for SALT research and publications included presentations on implementing sustainable farm lease arrangements delivered to more than 140 farm land owners at an ISU Extension and Outreach landowner seminar in Altoona, a landowner conference hosted by Agren in Carroll, and a women landowners group in Dallas County. In 2014 Edward Cox presented SALT resources to women landowners in Iowa City.
at a Women, Land, and Legacy meeting; Extension Energy Summit in Ames for Extension personnel from across the country; and American Farmland Trust Conference in Lexington, KY to farmers, landowners and service providers.

SALT infrastructure funds were used to provide educational resources on flash drives for more than 170 participants at the first National Farmer Veteran Stakeholder Conference at Drake University. The event was hosted by the Agricultural Law Center in partnership with the Farmer Veteran Coalition in November 2014. The flash drives included 50 resources from organizations around the country, including a copy of the Landowners Guide to Sustainable Farm Leasing as well as five other useful documents from the Leopold Center. (All of the resources are available on the SALT website: www.sustainablefarmlease.org.)

“Protecting Iowa’s Land Legacy: Soil and water conservation policy - Past, present and future”
This conference is scheduled for November 19-20, 2015 at Drake University. Co-sponsors (with Drake and the Leopold Center) include Wells Fargo, the USDA Natural Resources Conservation Service-Iowa, USDA ARS National Laboratory for Agriculture and the Environment, the Iowa Natural Heritage Foundation, Practical Farmers of Iowa, the Iowa League of Cities, Soil and Water Conservation Society, the Iowa Soybean Association, the Iowa Water Center, the Lillian Goldman Charitable Trust, and Dickinson Mackaman Tyler & Hagen, PC. The conference was preceded by a series of regional workshops in spring and summer 2015 to identify the most critical conservation policy issues to be considered at the conference.
Now in its fourth year as part of the Center’s competitive grants program, the Cross-Cutting Initiative continues to focus its effort and resources on critical agroecological systems research. The initiative, led by Malcolm Robertson, strengthened its portfolio on investigating integrated farming systems, alternative crops, energy and livestock systems while focusing on specific aspects such as soil health, production and landscape diversity, and increasing adoption of conservation practices.

Agroecological farming systems work

The Cross-Cutting Initiative approach to systems agriculture acknowledges the dynamic nature of agroecosystems. These systems exhibit a high degree of diversity, are more complex, require higher levels of management, and their sustainability relies on their ability to adapt to future challenges. Therefore, agroecological systems research takes time and money…and still more time to achieve acceptance and adoption.

The Leopold Center, most recently through the Cross-Cutting Initiative programming, has been a primary sponsor of two long-term research projects that have their roots grounded in systems agriculture.

The Long-Term Agroecological Research (LTAR) Experiment

This project uses established experiments, each with a unique crop rotation and management history, to look at long-term impacts of changes in soil microbiology on soil health. Its three research sites are the Long-Term Agroecological Research (LTAR) Experiment established in 1998 near Greenfield, the USDA-ARS Organic Water Quality site on the ISU Agronomy Research Farm in Boone County in its third year, and the Organic Reduced-Tillage site in its seventh year, and also located on the ISU Agronomy Research Farm. This unique program uses a multidisciplinary approach to analyze many of the system’s comprehensive components (productivity, soil health, pest status and economics). At the same time, it links the different crops used within each rotation and cropping system in a single year, which is important for conducting long-term annual analyses of the system’s performance. The findings from this extended research have supplied crucial information on the processes that create better soil quality in organic systems, which in turn can create competitive economic returns while maintaining or improving yields when compared to the modern conventional agricultural practices. Continued funding of this project will support additional soil and water sampling as well as development of Best Management Practices guides based on these research results.

Impacts of contrasting rotation systems and weed management regimes on weed dynamics and agroecosystem

This project uses data from a 22-acre cropping systems experiment at the ISU’s Marsden Farm to investigate differences in crop yields, soil properties, pathogen dynamics, agrichemical and energy use, production costs and net returns and selected ecological impacts. The plots compare three rotations: conventional 2-year rotation of corn-soybean and two more diverse systems—a 3-year corn-soybean-oat + red clover rotation and a 4-yr corn-soybean-oat + alfalfa-alfalfa rotation.
Previous findings from this long-term project showed that diversified crop production yields significant reductions in:

- soybean disease incidence and severity,
- aquatic toxicity, and
- fossil energy use,

as well as improvements in:

- crop yields,
- soil organic matter and potentially useable nitrogen (N) for crops, and
- net profitability.

This research has shown that weeds were suppressed as effectively in the longer rotations as in the two-year rotation. This was attributed to declining soil seedbanks and negligible weed biomass in the longer rotations, yet herbicide inputs in these plots were six to 10 times less. New funding for this project will build on the prior work while providing additional knowledge about weed seedbank dynamics. It also will investigate how herbicide regimes affect fossil energy inputs, greenhouse gas emissions, ozone formation and factors in Life Cycle Assessment (LCA).

**Energy and indirect climate work**

Two years of support for the dynamic University of Iowa Biomass Partnership project (with the Cross-Cutting Initiative serving as the primary funder) ended in 2015. The working group partners from UI and ISU designed and implemented a project that demonstrated how Iowa could generate renewable energy while simultaneously improving environmental performance (soil, water, wildlife habitat) and benefiting the people who live and work in the area.

The working group oversaw the planting of Giant Miscanthus (Miscanthus x giganteus) test plots and subsequently established two pilot fields in Muscatine and Johnson counties. Additional production plots were planted in 2015, advancing the project to a commercial scale. More than 350 acres of Miscanthus were planted with a goal of 2,500 acres of Miscanthus in the ground by 2016. In July 2015, the University of Iowa was honored with the Iowa Governor’s Award for Environmental Excellence for its initiative using a locally available grass to reduce the university’s carbon footprint.

Following the successful introduction of Miscanthus in eastern Iowa, a 2015 Cross-Cutting Initiative grant will help activate a new research program at ISU, the Long-term Assessment of Miscanthus Productivity and Sustainability, or LAMPS. It builds on work by the University of Iowa’s Biomass Partnership Project and will use a field-based approach to address the challenges facing Miscanthus establishment and production. The overall objective is to answer basic and applied research questions by fostering collaborative efforts among bioenergy researchers at ISU and UI. The field-scale experiment will provide producers with practical production information while developing best management practices (BMPs) for maintaining productive Miscanthus stands.
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 competitive process that includes a Request for Pre-proposals (RFP) in June, multiple reviews and assessment of full proposals submitted in November and awarding of funds in January.

**ECOLOGY INITIATIVE**

The Ecological Systems Research Initiative funded five proposals received from the Summer 2014 RFP. Sixteen projects were granted no-cost extensions or slated to end.

**New Ecology grants – FY2015**

- **Total amount awarded – $150,246**
- **Total number of projects – 5**

**NEW.** Crop diversity effects on soil organic matter and nitrate retention in surface and subsoils, 2 years

M. Castellano, ISU agronomy

This research looks at what happens deep within the soil profile (2-3 ft. below the surface) when alfalfa is added to the typical corn-soybean rotation. The key question is whether an extended rotation improves the soil’s ability to store carbon and organic matter at lower depths, making the soil more resilient to drought and to soil erosion and nutrient losses after heavy rainfall.

**NEW.** Economic impacts of soil erosion in Iowa, 1 year (ending)

R. Cruse, ISU agronomy; M. Shelley, ISU statistics; C. Burras, ISU agronomy; J. Tyndall, ISU natural resource ecology and management; and M. Miller, ISU agronomy

This study aims to quantify soil erosion and topsoil depth lost across Iowa’s HUC 12 watershed regions, determine how these values correspond to lost corn and soybean yield, and estimate the economic value of this loss.

**NEW.** Blurring the lines between working and conservation lands: Enhancing bird and pollinator habitat using prairie strips, 3 years

L. Schulte Moore and M. Harris, ISU natural resource ecology and management

This project examines how birds and pollinators respond to prairie strips planted on commercial farm fields. Data on bird response will be collected via autonomous recording units, auditory and visual bird surveys, and nest searching and monitoring. Bee species richness and diversity data will be gathered using pan traps, blue vane traps and sweep netting.

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

**NEW.** Improving soil health and water quality through better soil phosphorus assessment and management practices, 2 years

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

This research assesses the value of no-till and subsurface-banded applications of phosphorus fertilizer, especially as they relate to surface runoff. The information will be used to improve soil test recommendations for farmers.

**NEW.** Impacts of landscape and on-farm diversity on the abundance and health of bee pollinators, 3 years

A. Toth and A. Dolezal, ISU ecology, evolution and organismal biology; M. O’Neal and E. Hodgson, ISU entomology

The goal of this project is to better understand how agricultural landscape diversity and approaches to pest management impact the health of native bees and other pollinators. The experiment considers bee health in the context of landscape diversity, examining bees in both conventional row-crop systems and farms growing fruit and vegetables for Community Supported Agriculture (CSA) enterprises.

**NEW.** Implementing an ISU Extension Master Grazier Certification course, 3 years (ending)

H.J. Sellers, ISU Extension, Chariton; and M. Drewnoski, ISU animal science

Development of a Master Grazier Certification Program for Iowa State University potentially can increase the animal and environmental performance and economic competitiveness of Iowa’s grazing livestock systems. It focuses on farmer adoption and adaption of practices, building mentoring skills and developing social networks. This project builds on the successful Leopold Center-funded “Greenhorn Grazing” program.
Prairie contour strips: Demonstrating the importance of custom seed mix for biological integrity, 2 years
L. Jackson, biology, University of Northern Iowa, Cedar Falls
This project seeks to create a community of practice among prairie restoration specialists, technical service providers and landowners and land managers that is focused on prairie contour strips. Through its Prairies on Farm Project, the Tallgrass Prairie Center hopes this network can establish demonstration sites on farms and develop educational materials, including an online seed mix calculator, that will lead to broader awareness and use of prairie and prairie contour strips in Iowa.

Predicting long-term cover crop impacts on soil quality using a cropping systems model, 1 year, (extended)
F. Miquez, S. Archontoulis and A. Basche, ISU agronomy
This project monitored 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 eventually is 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.

Winter rye cover crop effect on corn seedling pathogens, 3 years (extended)
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 were studies in a controlled environment and on-farm field studies, as well as testing of management strategies to prevent or minimize corn yield decreases.

Quantifying nitrogen credits and impacts of cover crops on soil biology and health in vegetable cropping systems in Iowa, 1 year (extended)
A. Nair, ISU horticulture extension; K. Delate, ISU horticulture and agronomy; C. Bregendahl, Leopold Center for Sustainable Agriculture; G. Artz, ISU economics
The study collected data on cover crop nitrogen credits, nitrogen scavenging capacity, biomass generation capability, weed suppression properties and effects on soil quality and health in vegetable cropping systems. It also surveyed traditional crops (cereal rye, oats) and nontraditional cover crops (brassicas, mustards, peas, clovers, etc.). Cost-benefit analyses and enterprise budgets will be created for different cover crop types.

NEW A smartphone-based device for measuring soil organic matter, 1 year
M. Lu, ISU mechanical engineering and electrical and computer engineering; R. Cruse, ISU agronomy
The researcher proposes to develop, calibrate and pilot a camera and software system for smartphones that allows users to rapidly measure soil organic matter (SOM) content in the field. The pilot project will test data from the smartphone device against lab-based soil analysis to improve the accuracy of its calculating software.

Understanding microbial contributions to soil aggregation and organic matter accumulation, 1 year (ending)
K. Hofmockel and E. Bach, ISU ecology, evolution and organismal biology
The investigators characterized soil bacterial and fungal communities and the rates at which they break down plant-derived carbon in soil from three different farming systems: continuous corn, prairie and fertilized prairie. This project continues work started by the Comparison of Biofuel Systems (COBS) group.

Management and performance of Iowa cover crops, 1 year (extended)
J. Comito, Iowa Learning Farms; M. Helmers, ISU agricultural and biosystems engineering; J. Benning, ISU sociology; and T. Kaspar, USDA-ARS National Laboratory for Agriculture and the Environment, Ames
This Iowa Learning Farms project continues the efforts of the Iowa Cover Crops Working Group to determine long-term soil quality and crop yield changes resulting from planting cover crops on farms. The grant supports the 2014 cover crop planting on seven farmer-partner sites, as well data collection on soil quality and crop yield indicators for fall 2014 and spring 2015.

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 (ending)
J. Russell, ISU animal science; W. Powers, Michigan State University; and T. Isenhart, ISU natural resource ecology and management
The chief 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.
Quantifying the effect of perennial vegetation on soil and water quality, 3 years, (extended)
T. Isenhart and R. Schultz, ISU natural resource ecology and management, and K. Schilling, Iowa Department of Natural Resources
The investigators are using data from a well-established research site (Bear Creek in Story County) to interpret the influence of perennial vegetation on soil biogeochemical processes. The information will be used to develop a tool to assess the potential impact of changes in land use on the quality of stream water.

Integrating project knowledge and models:
The next step in developing a Payment for Ecosystem Services scheme for the Big Creek watershed, 1 year, (extended)
L. Schulte-Moore, J. Tyndall and T. Isenhart, 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; and 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.

Marketing and Food Systems Initiative
The Marketing and Food Systems Initiative funded five pre-proposals received from the Summer 2014 RFP. One project received an extension to complete its work.

New Marketing Initiative grants – FY2015
- Total amount awarded – $125,565
- Total number of projects – 5

Agricultural Urbanism Toolkit, 1 year
N. Anderson, ISU Extension and Outreach; and C. Long, ISU Community Design Laboratory
The investigators will collaborate with several Iowa communities to identify food system resources and needs for an agricultural urbanism toolkit. Issues such as health, walkability and transportation, equity, and business development and connectivity will be addressed, with the goal of connecting urban and rural food systems.

NEW – Agricultural Urbanism Toolkit, Years 2+3, 2 years
N. Anderson, ISU Extension and Outreach; C. Rogers and C. Long, ISU Community Design Laboratory
This project will expand use of the Agricultural Urbanism Toolkit created in 2014. Team members worked in three Iowa communities – Cedar Rapids, Cresco and Des Moines – in a year-long strategic planning process to understand and create a holistic food system that connects urban, rural, local and regional efforts to promote food accessibility in each community. The team will continue to work with the three pilot communities and establish the program in three new Iowa communities.

NEW – Building producer capacity for institutional food distribution, 2 years
M. Temeyer, Black Hawk County, ISU Extension and Outreach
Investigators will plan and develop a series of workshops to build the capacity of Cedar Valley producers to supply institutional markets in the region such as the University of Northern Iowa, supermarkets and a new Cedar Falls Food Co-op. The workshops will cover price negotiations, identifying crops, online ordering systems, food safety training, business planning and management. They hope to engage Burmese refugees with agrarian backgrounds who have settled in the region and have expressed interest in farm business development.

Increasing the capacity of a local food hub to service the public school market, 1 year
T. Wiemerslage, Northeast Iowa Program and Communications Coordinator, ISU Extension and Outreach
The investigator will continue work in the northeast Iowa region focusing on bringing local foods to schools. This project will team with the Northeast Iowa Food Hub to double the current amount of local food purchases in four school districts. Objectives include finding accessible prices for farms, processors and schools; finding models and methods that create networks between farms and schools; and creating distribution models that include schools and leverage existing resources.

NEW – Increasing local food consumption in rural communities by partnering with non-traditional food retailers, 1 year
N. Mabe, Iowa Food Hub, Decorah
The food hub will work with non-traditional retailers, such as meat lockers, feed stores and seasonal tourism attractions, to increase the access to local, healthy foods, especially fruits and vegetables. A new part-time marketing and sales assistant will help those retailers identify and market those foods in four rural communities with limited access to fresh foods.
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.

Market development and logistics for local food distribution in the Cedar Valley, 1 year
R. Wobeter, Local Food Program, University of Northern Iowa, Cedar Falls
This project will expand the reach of local foods in the Cedar Valley region by establishing a worksite community supported agriculture (CSA) program supplied by the Iowa Food Hub. The investigator will identify staff interested in managing the local food distribution site, institutional buyers who can access local food through the site, and area food purchasers and producers who may profit from awareness of local foods options and accessibility through the project.

NEw ➞ Small-farm business development incubators for refugee farmers, 2 years
N. Wuertz, Lutheran Services of Iowa, Des Moines
This project continues work that began as part of 2011 and 2014 Leopold Center competitive grants to create a program to help recent immigrants to the Des Moines area establish their own agricultural businesses. LSI has set up the Global Greens Farm in West Des Moines, a site for community garden plots and an incubator training program. This project will develop the next step, quarter-acre plots for eight participants who will transition to their own land and successful enterprise over three to five years.

NEw ➞ Supply chain management for Iowa regional food systems, 2 years
C. Krejci, ISU industrial and manufacturing systems engineering, A. Shaw, ISU food science and human nutrition
Investigators will work with two food hubs in Iowa and one logistics provider to apply supply chain management and food safety principles and methodologies to their operations. Partners include the Iowa Food Hub in Decorah, the Iowa Food Cooperative in Des Moines and FarmTable Procurement based in Harlan, Iowa. They will analyze inbound and outbound logistics and aggregation/staging activities to maintain food safety and quality and increase efficiency.

POLICY INITIATIVE
The Policy Research Initiative funded two proposals received from the Summer 2014 RFP. Two other grants completed a second year of operation.

New Policy Initiative grants – FY2015
- Total amount awarded – $84,500
- Total number of projects – 2

NEw ➞ Reducing local regulatory barriers to local foods Phase 2: Local foods and county zoning project, 1 year
G. Taylor, ISU community and regional planning
The investigator will develop a guidebook for county officials in Iowa covering county zoning and land use regulations as they relate to agritourism, on-site processing and sales, event marketing and other activities that may be associated with local market farms. The guidebook will review legal issues associated with the agricultural exemption and its implications for county zoning codes and practices.

Sustainable Agricultural Land Tenure: The legal rights and duties of entity ownership of Iowa farm land and the next generation of landowners, 1 year (ending)
N. Hamilton and E. Cox, Agricultural Law Center, Drake University, Des Moines
Through the Sustainable Agricultural Land Tenure (SALT) Initiative, investigators will produce a “Legacy Report” for farmers, landowners and their legal advisors that illustrates how property is passed on to the next generation of farm owners, particularly by identifying current and best land management practices that emphasize sustainability and resilience of the land’s resources. The project will identify sustainable land management options relevant to the specific property being passed on, and create legal resources for courts to rely on to aid cases involving farmland resource mismanagement.
**CROSS-CUTTING INITIATIVE**
The Cross-Cutting Initiative funded five pre-proposals received from the Summer 2014 RFP. Another five projects were renewed for a second or third year of funding or given extensions to complete their work.

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<th>New Cross-Cutting Initiative grants – FY2015</th>
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<td>- Total amount awarded – $151,310</td>
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<td>- Total number of projects – 5</td>
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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.

Food safety, economics and environmental impacts of aquaponics in Iowa, 1 year
D. Patillo, ISU natural resource ecology and management; K. Rosentrater, ISU agricultural and biosystems engineering; and A. Shaw, ISU food science and human nutrition
The investigators will continue research on aquaponics systems which raise fish and grow herbs and vegetables in a closed loop system that recycles most water and nutrients. The project aims to identify how to eradicate potential disease-causing microorganisms in the system; quantify the economic costs, benefits and other impacts associated with setting up the system; and document the environmental impacts associated with the system.

**NEW**  
- Impacts of contrasting rotation systems and weed management regimes on weed dynamics and agroecosystem health, 3 years
  M. Liebman, ISU agronomy; A. Johanns, ISU Extension and Outreach. Osage; J. Hill, University of Minnesota-St. Paul
  This project uses data from a 22-acre cropping systems experiment at the ISU Marsden Farm to investigate differences in crop yields, soil properties, pathogen dynamics, agrichemical and energy use, production costs and net returns and selected ecological impacts. The plots compare three diverse crop rotations. It will provide new knowledge about weed seed bank dynamics and how herbicide regimes affect fossil energy inputs, greenhouse gas emissions, ozone formation and factors in Life Cycle Assessment (LCA).

**NEW**  
- Linking soil and water quality with crop performance across a continuum of tillage and management strategies, Years 2 and 3, 2 years
  K. Delate, ISU agronomy and horticulture; C. Cambardella and M. Bakker, USDA-ARS National Laboratory for Agriculture and the Environment, Ames; A. Johanns, ISU Extension and Outreach, Osage
  This project uses established experiments, each with a unique crop rotation and management history, to look at long-term impacts of changes in soil microbiology on soil health. The three sites are the Long-Term Agroecological Research (LTAR) Experiment established in 1998 near Greenfield, the USDA-ARS Organic Water Quality site on the ISU Agronomy Research Farm in Boone County in its third year, and the Organic Reduced-Tillage site in its seventh year, also on the ISU Agronomy Farm. Additional soil and water samples will be collected as part of this grant, as well as development of Best Management Practices guides based on research results.

**NEW**  
- Long-term assessment of miscanthus productivity and sustainability (LAMPS), 2 years
  E. Heaton, N. Boersma, and C. Bonin, ISU agronomy; I. Anderson, University of Iowa
  This new research program, the Long-term Assessment of Miscanthus Productivity and Sustainability (LAMPS), builds on work by the University of Iowa’s Biomass Partnership Project. The UI 2020 goal of 40 percent renewable energy could be met by burning sustainably produced biomass with fossil fuels in the University’s power plant. Investigators plan to establish miscanthus fields at sites in northwest and central Iowa, in addition to the initial 15-acre field near Iowa City in southeastern Iowa.
NEW Sustainably growing Iowa’s beef herds: Evaluating systems that provide economic opportunities while protecting soil and water resources, 3 years
H. J. Sellers, ISU Extension and Outreach; L. Schulz, ISU economics; P. Gunn, ISU animal science
Investigators will work with 24 beef producers using one of three grazing systems: traditional grazing, extensive grazing and limited grazing. Using benchmark data, they will analyze the environmental and economic sustainability of each model as well as the risk-bearing ability of each system. They will create case studies of practices for successful operations in each system to share with Iowa cow-calf producers.

NEW Budgeting for organic dairying, 1 year
L. Tranel, ISU Extension and Outreach, Dubuque
The investigator is working with producers in the Organic Valley Cooperative to develop seven organic dairy budgets that will allow users to compare various organic systems based on milk production, feeding levels and breed. The new materials will be explained in a recorded presentation and used at pasture walks and various dairy producer meetings.
join us in preserving our natural resources

He plants trees to benefit another generation. - Caecilius Statius