

Local food sales continue to expand in Iowa

By LAURA MILLER, Newsletter editor

For two years running, Iowa's local food economy has grown faster than expected and in ways not tracked by federal agencies. A new report from the Leopold Center also shows how modest public investment in the work of local food coordinators contributes to job creation in the state.

Sales of local food to grocery stores, restaurants, residential food service operations, food hubs, food auctions and other high-volume markets rose from \$8.9 million in 2012 to \$13.1 million in 2013, for a total of more than \$22 million

over the two-year period. The report cites data showing that these larger markets are rapidly eclipsing direct-to-consumer sales at farmers markets and from Community Supported Agriculture (CSAs).

All this activity spells good economic news for rural communities and farm-based businesses in Iowa, including the creation of 171 new jobs in 2012 and 2013.

The findings are part of an evaluation of the Regional Food Systems Working Group (RFSWG), a statewide network that connects 15 local food coordinators working in 91 of Iowa's 99 counties.

LOCAL FOOD (continued on page 4)

Prairie strips getting results, growing quickly

By STEFANIE TROUT, Leopold Center Graduate Communications Assistant

For the STRIPS research team, 2014 has been an exciting, productive year. STRIPS stands for Science-based Trials of Rowcrops Integrated with Prairie Strips. The project began in 2004, testing how crop fields strategically planted with small amounts of prairie can yield disproportionate, multi-functional benefits to soils, watersheds, wildlife habitat and biodiversity. This year, the STRIPS research team has made swift progress toward getting more prairie strips on the land and spreading the word about this innovative new conservation practice.

The first STRIPS research site was set up at the Neal Smith National Wildlife Refuge in Jasper County in 2007. Raising the crops is area farmer Gary Van Ryswyk, who was drawn to the project by its potential to reduce erosion. This early research showed that small prairie strips do make a big difference.

"I was amazed as to how much soil can be lost in a huge rain event and how well the strips actually worked, even though they hadn't been established for very many years yet," Van Ryswyk says.

The STRIPS team found 40 percent less runoff in the crop fields treated with prairie strips, which reduced soil loss by 95 percent, phosphorus loss by 90 percent and nitrogen loss by 84 percent. In addition, the prairie strips resulted in a four-fold increase in plant species, twice the number of bird species, and three times the bird abundance.

In 2013, southwest Iowa farmer Seth Watkins was the first to put prairie strips on his own land. He also was concerned about erosion, but he chose prairie strips over other erosion-reducing strategies because of the additional benefits they provide, such as habitat for game birds.

So many farmers were coming forward

STRIPS (continued on page 8)

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LEOPOLD LETTER MISSION

The mission of the *Leopold Letter* is to inform diverse audiences about Leopold Center programs and activities; to encourage increased interest in and use of sustainable farming practices and market opportunities for sustainable products; and to stimulate public discussion about sustainable agriculture in Iowa and the nation.

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The Leopold Center for Sustainable Agriculture seeks to identify and reduce adverse socioeconomic and environmental impacts of farming practices, develop profitable farming systems that conserve natural resources, and create educational programs with the ISU Extension Service. It was founded by the 1987 Iowa Groundwater Protection Act. The *Leopold Letter* is available free from the Leopold Center at 209 Curtiss Hall, Iowa State University, Ames, Iowa 50011-1050; (515) 294-3711.



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Research Results

On the web: www.leopold.iastate.edu/news/results
and www.leopold.iastate.edu/grants/completed

Summaries

Easy-to-read summaries are available for these recently completed projects funded by Leopold Center grants:

- Building social networks to capture synergies in wood-based energy production and invasive pest migration
- Comparison of Biofuel Systems (COBS) project biomass energy conversion and energy return on investment analyses for 2012 growing season
- Farmer perspectives on ecosystems service management, land use targeting and the future of Cornbelt agriculture
- Farm-metered energy analyses: Getting baseline data, ground-truthing changes
- Improving profitability for small and very small meat processors in Iowa
- Innovative equipment solutions to reduce costs and improve productivity for small-scale fruit and vegetable growers
- Niche markets in the agricultural enterprise mix: Farm profit optimization and risk analysis
- Re-connecting Iowa riparian buffers with tile drainage (1 and 2)
- The extent and impact of trust ownership on the sustainability and resiliency of Iowa's agricultural landscape
- Understanding soil organic matter change: Modeling root and soil interactions across soil landscapes
- What drives corn yield stability in the context of climate variability?
- Convening the Regional Food Systems Working Group
- Transitioning farmers to produce for wholesale markets
- Machinery management for small- and medium-sized horticultural farms
- Crop availability of phosphorus in beef manure
- Transitioning to ecologically functional production systems
- Evaluating perennial crop options for inclusion in agroforestry systems

News & Notes

Leopold Center staff members have created several new resources to help communities build and strengthen local food systems. *Funding Opportunities in Local Foods* outlines 31 federal, state and private grant programs available as funding sources for projects related to local food.

Local Food Coordinators SP463 describes tasks of a local food coordinator, complete with a job description. *Supporting Local Food System Development in Your Community LF0002* offers a step-by-step guide to forming coalitions and groups around interest in local food, community gardens, farm-to-school and other activities. All are available by title on the Leopold Center's Pubs & Papers web page, www.leopold.iastate.edu/pubs/alpha, or at the ISU Extension Store, store.extension.iastate.edu.

Mark Hanna, agricultural and biosystems engineering professor, received the Award for Achievement in Intellectual Property from Iowa State University in September.

As part of a 2000 Leopold Center research grant, he studied better ways to control application of anhydrous ammonia. The work led to the award-winning Impellicone manifold that has generated more than \$4.4 million in sales and \$250,000 in licensing fees.

More than 170 people attended the first National Farmer Veteran Stakeholder Conference at Drake University in November. Policy Initiative funds for the Sustainable Agriculture Land Tenure (SALT) program operated by Drake University's Ag Law Center supported the event in partnership with the Farmer Veteran Coalition. Other SALT program outreach included presentations to 40 women attending a Women, Land and Legacy meeting in Iowa City, the Extension Energy Summit in Ames and 50 farmers, landowners and service providers at the American Farmland Trust Conference in Lexington, Kentucky.

Conversations

WITH DIRECTOR MARK RASMUSSEN

When used according to label directions



I have concluded that people are a bundle of contradictions. We expend considerable time and effort as a society to research, write and negotiate very complex legal devices called product labels. Yet, with a wink and a nod, we don't bother to read or follow them. Let me start by asking: Who reads labels and exactly follows the dosage and precautions listed? Or, who carefully examines the product label on a garden or crop protection container before applying the active ingredient(s) on the land?

We seem to regard label directions as a bother and a nuisance. How many times have you purchased a small bottle of medicine only to discover that the label neatly attached to the bottle unfolds into a multipage document the size of a small newspaper? Label language seems rather intimidating at times, and so complex it is hard to find the dosage information contained within them.

Labels also seem to get more complicated with time as additional facts or warnings need to be added for safe and proper use. Biochemistry, pharmacology and physiology are complicated subjects and labels have to reflect this complexity in language that can be understood and followed for proper use.

Labels contain a lot of information in terms of dosage, directions for use, precautionary statements, active ingredients, storage conditions, expiration date, manufacturer and emergency hazard information and much more. A label is a carefully crafted legal document that we are bound by law to read and follow, especially in terms of dosage and precautions. Other than some limited exceptions for medical and veterinary professionals, it is a violation of federal law to use a product differently than what is specified on the label. However, as a population, we apparently are not very good about following the law or the label, even when we are the intended application target. Take the pain reliever, acetaminophen. It is the leading cause of acute liver failure as a result of overuse and this commonly used medication results in about 33,000 acute hospitalizations per year.

Labels also serve other purposes. They act as legal liability limits for the drug or chemical manufacturer. This is seen in the printed warranty disclaimer language and when we hear the common phrase on TV and radio advertising: "Always read and follow label directions." Try to get a product salesperson to openly direct a user to do anything that is contrary to label directions. Private directives are another issue, however, and regardless of the basis for their decision, misuse by the end user remains a persistent problem.

Labels also can change over time as new results, complications or sensitivities are discovered. This updated information may be featured in a bold box statement which often starts with the phrase: "Misuse of this product can result in severe..."

In agriculture, current examples in flux include the neonicotinoid insecticides. New research on low level dosage effects on pollinating and other non-target insects is prompting new label restrictions and a reevaluation of their use as crop protection chemicals.

Unfortunately, labels also can become politicized as manufacturers, users, consumers, scientists and regulators argue over data, language, proper use and misuse of a product. As a result, many important facets of these labels get lost if the controversy reaches the political world. Bad decisions and harm frequently are the result of such politicized labeling disputes.

Agriculture is no stranger to the confusing process of dealing with labels. They are affixed to everything from crop bag tags to containers of crop protection chemicals to animal feed supplements and drugs. Crop protection chemical labels often contain restrictions regarding wind speed at time of application, neighbor notification requirements, sensitive plant and animal information and appropriate buffer zone use. Livestock producers are informed via labels of use restrictions such as site of injection, specific class of animal prohibitions and necessary withdrawal times to avoid residues in meat.

But, we in agriculture don't do much better at reading and heeding labels than the rest of the population. The expansion of pesticide resistance in certain weeds and insects is, in part, a result of producers' failures to follow label directions. There also is considerable agitation over the potential for drift and harm to adjacent crops when agricultural chemical use restrictions are not followed carefully. Livestock producers can receive warning letters from the Food and Drug Administration when illegal levels of drug residues are detected in food animals. Producers soon appreciate that receipt of such a letter is serious business that requires prompt attention. Cull dairy cows are subject to special FDA scrutiny given the frequency with which antimicrobial drugs and pain reliever residues are found in these animals.

So, in this cynical era, I wonder if we have become desensitized and entirely too cavalier with respect to reading labels and acknowledging the important information they provide. We need to remember the fundamental reasons why labels exist, and why it is important to follow the directions they offer. Yes, it's the law, but they also help us avoid doing harm to ourselves, our food supply, and our natural resources and ultimately our kids and the world they will inherit from us. If you won't bother to read and follow the labels for yourself, do it for the kids.

Mark Rasmussen

LOCAL FOOD SALES CONTINUE TO EXPAND

LOCAL FOOD (continued from page 1)

Like last year, the coordinators recruited local food producers and buyers from their respective regions to complete a survey that measured local food sales by farmers, local food purchases by grocery stores, restaurants and buyers for institutions and other high-volume markets, job creation as a result of local foods, and funds leveraged by RFSWG groups.

"Farmers reported increases in their sales from 2012 to 2013, even when adjusted for inflation," said Corry Bregendahl, who coordinated the data collection project for the Leopold Center with Leopold Center program assistant Arlene Enderton. "Total sales of local food, as reported by 103 farmers in 2012 and 120 farmers in 2013, nearly topped \$24 million."

Those totals offer a broader picture of the local food boom than that shown in data collected by the U.S. Census of Agriculture, Bregendahl said. The federal farm census tracks only sales directly to consumers such as at farmers markets, farm stands and CSA enterprises. Farmers are not asked to report sales to restaurants, grocery stores and other retailers, or to institutions such as schools, hospitals and residential living facilities. In the 2012 U.S. Census of Agriculture, 2,954 Iowa farms reported \$17.5 million in direct sales.

"Using our 2013 data, we captured 74 percent of the 2012 Census of Agriculture local food sales with only 4 percent of the sample size," Bregendahl explained.

"Our data suggest that only a small portion of our farmers' local food sales—about 5 percent—was sold directly to consumers. Iowa local food sales could be exceeding \$300 million instead of the \$17 million reported in the 2012 Census of Agriculture, if we had a better system in place for tracking sales to high-volume buyers such as grocery stores, restaurants, school food service, food distributors, and others."

Local food and jobs

Food producers were asked to share information about existing jobs on their farms as well as any new jobs created as a result of local food production. Similarly, local food buyers were asked if any new jobs had been created in their businesses as a result of local food purchases.

In 2013, 118 new jobs were created on farms and by local food buyers. Combined with 53 new jobs reported in 2012, the two-year total is 171 new jobs, of which more than one-third are full-time. These new jobs were created on the farm, in sales and marketing, processing, distribution, nutrition education, horticultural education, and culinary arts, among others. When compared to other sectors, the public cost of creating one new full-time job in the local foods sector is low, at \$15,661.

"This is a very modest public investment, especially when you look at the cost of recruiting low-paying retail jobs from outside the state," Bregendahl said. "A wiser investment approach to creating jobs

 www.leopold.iastate.edu

2013 Economic Impacts of Iowa's
Regional Food Systems Working Group:
[www.leopold.iastate.edu/
local-food](http://www.leopold.iastate.edu/local-food)

Local food by the numbers

- » RFSWG network: **15** groups, working in **91** of **99** Iowa counties
- » 2013 economic impacts report: **3** surveys, **120** farmers, **74** buyers, **13** regions reporting data
- » **\$13 million:** Total local food sales by farmers, 2013
- » **\$13.1 million:** Total local food purchases by buyers, 2013
- » **\$108,629:** Average local food sales/farm, 2013
- » **\$179,845:** Average total local food purchase/buyer, 2013
- » **171:** Total new jobs created, 2012-2013
- » **\$15,661:** Public investment/local food sector FTE job over 2 years

in Iowa is to grow our own in the local foods sector. These local food coordinators are showing that they can do that."

In addition to economic benefits and job creation, Bregendahl said coordinators in the RFSWG network raised more than \$1.5 million during the two-year period, from government and philanthropic grants, donations, fundraisers and voter-approved County Extension funds. A significant portion of those funds came from outside the state.

The Leopold Center also created reports for each regional group that supplied sufficient data.

These 15 regional food groups are part of RFSWG: Flavors of Northwest Iowa, Healthy Harvest of North Iowa, Northeast Iowa Food and Farm Coalition, the Northern Iowa Food and Farm Partnership, Field to Family Food Coalition, Dubuque Eats Well, the Quad Cities Food Hub, Hometown Harvest of Southeast Iowa, South Central Iowa Area Partnership, Southern Iowa Local Foods Initiative, Southwest Iowa Food and Farm Initiative, Eat Greater Des Moines, Central Iowa RFSWG, the Greene County Local Foods Working Group and Harvest from the Heart.

Face of a local food champion

When Miles Breed became Director of Dining Services at Clarke University in Dubuque two years ago, one of his first stops was to meet vendors at the farmers market. His goal was to form relationships with farmers so he could include more local food in meals served to students.

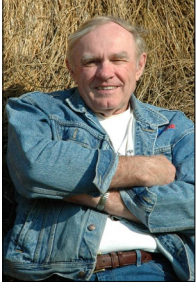
The dining service is self-operated, which gives him the freedom to decide where he will buy food. He prefers local farmers, which supports the local economy and ensures a fresh product, like the apples from Buffalo Ridge Orchards in Central City.

"When you bite into one of their apples, you can taste the difference," Breed says. "It's tangible."

The college also supports two interns each summer in the campus garden, which happens to be visible from the dining hall. They have been able to use pumpkins and squash from the campus garden in menus, and feature a local foods lunch and farmers market in the main dining hall to celebrate World Food Day.

Adapted from a profile prepared by Arlene Enderton for Dubuque Eats Well. Photo courtesy of Ron and Jennifer Tigges, Digital Dubuque.





What's an education for, 2.0

The first thing that college is for is to teach you to think... Learning how to think is only the beginning, though. There is something in particular you need to think about: yourself... The purpose of college, to put all this another way, is to turn adolescents into adults... The idea that we should take the first four years of young adulthood and devote them to career preparation alone, neglecting every other part of life, is nothing short of an obscenity.

—William Deresiewicz, 2014

In the Spring 2013 *Leopold Letter* I addressed the question, “What’s an education for?” Based on my own experience plus reflections from a few others, I attempted to discuss key issues that I hoped would stimulate conversations about our current educational culture, especially as applied to agriculture.

A few weeks ago a friend called my attention to a new book, *Excellent Sheep: The Miseducation of the American Elite and the Way to a Meaningful Life*, by William Deresiewicz. The author provides a comprehensive, insightful (and “withering”) analysis of all that is wrong with our current higher education system, and invites us to an inspiring, practical alternative. I could not resist discussing his core principles in this second column.

While the entire book is replete with poignant insights and inspiring suggestions, the chapter “What is College For” is particularly relevant to those of us engaged in, and affected by, today’s higher education. Here Deresiewicz points out that most of our conversation about higher education revolves around tuition costs, student debt, daunting labor markets, budget squeezes, distance learning and “whether college in its present form is even necessary.” While these are important questions, missing in most of our conversations is “what makes for a happy life and a good society.” Furthermore, “education is more than the acquisition of marketable skills... To ask what college is for is to ask what life is for, what society is for...”

Consequently, when we focus most of our attention on STEM (Science Technology Engineering and Math) courses—almost to the exclusion of the humanities, as is often the case—students are led “in the wrong direction.”

I am not suggesting that STEM courses are unimportant, far from it. But we need to recognize that educating students exclusively on such subjects suggests to students that the only purpose of education is to make them the “most employable,” as Deresiewicz puts it. This is not the most insightful; it’s all about “average income” rather than “job satisfaction” or how to address future challenges while living a meaningful life. In this educational environment, he says that “liberal arts has become a put-down, and ‘English major’ a punch line.” The problem is that while students certainly “need to get a job,” they also “need to get a life.”

Deresiewicz says that the goal of a college education is “to teach you how to think.” He goes on to say that “doesn’t simply mean

developing the mental skills particular to individual disciplines—how to solve an equation or construct a study or analyze a text—it means developing the habit of skepticism and the capacity to put it into practice. It means learning not to take things for granted, so you can reach your own conclusions.”

Such learning is important, especially to future generations who will face challenges far greater than those which we, who are teaching now, ever had to face, such as the end of cheap energy, climate change and depleting natural resources. In the face of such trials, unfortunately, most of us still operate as part of a culture that assumes we can dominate and control nature, rather than learn to join with nature and adapt to her emerging evolution.

In this regard, Thomas Berry reminded us of the core failure of our universities: “As now functioning, the university prepares students for their role in extending human domination over the natural world, not for intimate presence to the natural world.” The result is that students “are caught in a severe cultural disorientation, a disorientation that is sustained intellectually by the university...” (Berry, 1999).

If we want the current generation of students to acquire the skills and mindsets to successfully address future challenges, and have meaningful lives, we must engage in serious conversations about our educational system. What is an education for? What is our responsibility to future generations, both humans and the “biotic community”?

Here’s the question we could all ask ourselves: How can we provide students with an education that enables them at the end of their lives to say something similar to what Winston Churchill said in the last days of his life? Said Churchill: “It has been a grand journey—well worth making once.”

References:

- Deresiewicz, William, 2014. *Excellent Sheep: The Miseducation of the American Elite and the Way to a Meaningful Life*. New York, Free Press. 77-87.
- Berry, Thomas. 1999. *The Great Work: Our Way Into the Future*. New York, Bell Tower. 72-74.

Meet our Spencer Award winners

EDITOR'S NOTE: The Spencer Award recognizes those who have made significant contributions to the environmental and economic stability of Iowa's family farms. In our last newsletter, we announced the 2014 winners, Leigh Adcock and Steve

Berger, and introduced their work from the perspectives of those who nominated them for the award. Since then, our Graduate Communications Assistant, Stefanie Trout, spoke with each award winner about what sustainability means to them.

LEIGH ADCOCK ON SUSTAINABILITY AND EMPOWERING WOMEN

Leigh Adcock grew up on a century farm in northwest Iowa. "I always spent most of my time outdoors, and my Dad was an outdoorsman," she says. "He taught me the names of every bug, and rock and animal, and we identified prints. So I grew up with that sort of awareness of the environment, just from living out in the country."

Adcock brought that awareness to the Iowa-based Women, Food and Agriculture Network (WFAN), where she served as executive director from 2008 to 2014. This year she hands the reins to WFAN's new executive director, Bridget Holcomb.

Under Adcock's leadership, WFAN grew from an organization of 300 regional members to a national reach of almost 5,000. "We were getting calls and emails every week from women all over the country saying, 'How do we get in WFAN?' Women want to talk to each other about their experiences of either farming or doing advocacy for farmers."

The 2012 Ag Census determined 14 percent of the nation's 2.1 million farms were operated principally by a woman. These women managed 62.7 million acres and sold \$12.9 billion in agricultural products. "Lots of women want to get into food production," Adcock says. "They want spaces where they can learn from each other, and they want social time together and educational time together."

WFAN's current programs include:

- Women Caring for the LandSM, which educates women landowners about conservation methods for their own land;
- Harvesting Our PotentialSM, an on-farm apprenticeship program that places aspiring women farmers on women-owned farms for 8-10 weeks during the growing season; and
- Plate to PoliticsSM, which provides women with information and tools to help them advocate for sustainable agriculture and healthy food systems at all levels of policy-making.

They also organize an annual conference, which continues to be the most popular gathering opportunity for WFAN members. "It gives women the chance to get to know each other face-to-face for a couple of days," Adcock says.

Most of the organization's members belong to several different food and agriculture groups, but WFAN serves a unique purpose. "Every two years we do a survey, asking our members, 'Why is it important for you to belong to a group that's just for women?' And they say, 'It's important because we experience the world of agriculture and the world in general differently from men. There are things that we think about that men don't. Challenges we face that men don't. And we want to talk to each other about that in a safe space for women only.'"

Adcock says that WFAN is about women empowerment, especially working with older female landowners.

"Helping them find their power is amazing," Adcock says. "They have rarely been asked their opinions about the farm or the agriculture that happens on it. They've rarely had a lot of influence within that group of men that are typically operating the farm. And even just telling them the statistic that almost 50 percent of the farmland in Iowa, for example, is owned or co-owned by women, you can just see them sit up a little straighter."

"I think it can make an enormous difference in their lives to help them communicate their opinions with their farmers: 'Can we do this in a way that doesn't harm the land? Can we plant some buffer strips? Can we keep the cows out of the creek? Can we use fewer chemicals somehow?' If these women actually were able to translate their values into action on that land, the state would look quite a bit different, I think, than it does right now."

About 40 percent of WFAN's members self-identify as farmers, but Adcock emphasizes that most women are involved in other ways. "We're going to be involved in buying food from those farmers or supporting policy that supports those farmers."

"What gets grown, where you can sell it, how much you get for it, whether you have a safety net if your crop fails—all of that is driven by policy," Adcock says. "So what I say to women in particular is: You *have* to get involved in policy. You don't have to run for office, but *do*, even if it's just your co-op board



Leigh Adcock on her acreage in Gilbert, Iowa.

or your school board to try to help your school lunches get better. You can make huge differences in your own community. And then support the organizations that are actually working on sustainable agriculture policy and trying to promote that in Congress."

Adcock cites WFAN's founder, Denise O'Brien, as one of her sustainability role models. "Denise is a warrior," she says. "Fred Kirschenmann would be another. He's a phenomenal thinker, and he has that capacity to identify what's needed and make it happen."

As for her own role, Adcock describes herself as more of a synthesizer. "I'm much more comfortable behind the scenes making connections for people to move forward, providing them with resources," she says.

Adcock defines "sustainability" as not just a *style* of agriculture but also one's place within it. "You have to be able to sustain yourself, your family, not only economically, but personally, socially," she says. "You have to have some energy to live a life that makes you happy at the end of the day. Sustainability means keeping your family and your community healthy and in balance over time."

See the winners receive their awards at the 9th Annual Iowa Water Conference, to be held March 2-3, 2015, in Ames.

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STEVE BERGER ON COMMITTING TO CONSERVATION

Steve Berger farms with his parents, Dennis and Janice, and his wife, Julie, on more than 2,000 acres in Washington County. He describes the family farm as a typical corn-soybean operation, but the Berbers' focus on conservation has distinguished their farm as unique.

Dennis started no-tilling in the 1970s at the behest of the local Iowa State University Extension Director, Jim Frier. By the time Steve graduated from ISU with a degree in Agricultural Business and returned home to farm in 1986, no-till was simply a fact of life on the Berger Farm.

"My dad has always been a real leader in conservation," Steve says, "so it's kind of a natural thing. I really don't know much else besides no-till farming."

The Berbers started planting cover crops 15 years ago and in the last five to seven years began cover cropping almost all of their acres. "We feel adding the cover crop to no-till is almost a must now. It helps develop the microbes in the soil, which helps build the soil, which helps the crops, so we feel that not only are there conservation benefits, like saving the soil from erosion and trying to cut back on nutrient loss to our streams, we also think that maybe it's helping our crop yields, too. We see kind of a win-win situation there."

Steve admits that he is a very competitive person—and says he has to be because Washington County is a competitive county.

"You have to be better than average, over the long term, or else you're not going to make it," Steve says. "Everything we do is kind of based around conservation, but it has to work. This is serious. We're not going in this to be below average."

The Berbers don't have to worry about being below average because no-tilling and cover crops are, in fact, working. Their yields are typically 10-15 percent above the county average.

Still, Steve isn't afraid to share his family's secret: "You have to stop tilling the soil, start growing cover crops, and get involved in your watersheds. If you're not sustainable, you won't be around."

Steve Berger knew he was going to be working the family farm "pretty much from

day one." He was driving a tractor in first grade and planted his first corn field in fourth grade. He likes farming because it is challenging.

"I don't know anything else I'd rather do," he says. "It's just a great way of life. It's fun to see things grow."

The Berbers added a farrow-to-finish swine operation to their farm in the early 1990s. "Between the crops and the livestock, it keeps us pretty busy," Steve says. He values having a diversified farm. "It's a system," he says. "Like Grandpa had."

When not working the fields, Steve serves as a board member for the English River Watershed and attends workshops and conferences—both as a teacher sharing his experiences and as a student. While he is very happy with the success of his no-till and cover cropping, he says, "There's so much more to learn. We're not done yet. I'm sure five, ten years from now, we'll be doing things differently."

Currently, the Berbers exclusively use cereal rye to cover their soil. Going forward, they are looking at oats and annual rye grasses to diversify their cover. They also are considering extending their crop rotation, thanks to the research of last year's winner of the Spencer Award for Sustainable Agriculture, Matt Liebman.

"We have a lot to lose," Steve says, referring to Iowa's rich topsoil, "and we have already lost a lot. It's a lot of responsibility to take care of the land, and there is a lot of satisfaction in doing that. We just think it's the right thing to do."

The Berbers have acquired several properties over the years, and Steve is always talking about the different farms with his father.

"When we're in a field, we always refer to that farm by its name, so it has some history attached to it," he explains.

"Each farm is better or worse depending on how well it was managed. Hopefully there will be somebody 20, 30, 40, 100 years from now saying they're on a Berger farm, and we would hope that that's a good thing. The soil never lies. It takes it all in, whatever you do to it."

Aside from his father, Steve cites the strong local leadership—from



Steve and Dennis Berger, planting soybeans into a rye cover crop.

County Extension to what was then called the Soil Conservation Service—as early influences.

He also thinks the competitiveness of agriculture in Washington County helped push the Berger farm toward the innovative conservation practices he was exposed to as a kid.

More recently, Steve has been inspired by Aldo Leopold's "Land Ethic," collaboration with various agricultural groups, and local peer group farmer friends who challenge each other.

Steve says the most important thing his family did was to stick with the new conservation practices, learning and adapting along the way, which was critical because working with soils is a long-term process.

"It took hundreds of thousands of years to develop that soil, and you just don't develop a microbial system in one year," he says.

With just no-till, Steve estimates that it might take seven to ten years, but by adding cover crops to the no-till, farmers can start to see real benefits in as little as three to four years.

"Great things happen when you put roots in the soil," Steve says.

Learn more about the Spencer Award at www.leopold.iastate.edu/spencer-award.

Photo courtesy Lynn Betts

PRAIRIE STRIPS GETTING RESULTS, GROWING QUICKLY

STRIPS (continued from page 1)

to ask for prairie strips that in February of this year, agricultural specialist Timothy Youngquist was hired as the STRIPS team's full-time farmer liaison. For the past 10 months, Youngquist has been networking with farmers across Iowa to set up more STRIPS research and demonstration sites. The STRIPS team now has 22 sites in Iowa—and one in northern Missouri—totaling approximately 100 acres of prairie strips treating 1,000 acres of crop land.

The STRIPS team continues to collect data from multiple sites. Several sites, including those at Des Moines Water Works and Whiterock Conservancy, are being set up with Autonomous Recording Units, or ARUs, that power on at dawn and record audio for three hours. Programmed with different birdsongs, the ARUs are telling researchers which species are in the strips and how they are using them.

On field days, farmers and others interested in STRIPS can visit the demonstration sites to see what the prairie strips look like on the land. They all look a little different because the STRIPS team places a premium on working with farmers to design what is best for each site. They don't have a one-size-fits-all approach, and the farmers appreciate the flexibility.

"That's the linchpin of this whole thing," Youngquist says. "If the farmers buy into it, this is going to be successful."

Seventeen of the 23 sites are on private property. Other sites are on Iowa State University Research and Demonstration Farms. ISU's McNay and Armstrong farms already have prairie strips in place. Two other ISU farms have sites laid out; they will be seeded in the coming months. These four sites plus one at Whiterock Conservancy will be used by the research team for paired comparison studies, adding to the STRIPS team's growing understanding of how prairie strips work on different landscapes. Hydraulic flumes, or h-flumes, will be set up on each of these paired comparison sites to collect water—and all of the nutrients it carries—coming

from the base of crop fields, comparing untreated fields with those where prairie strips have been designed to increase infiltration.

The team has been sharing news about prairie strips at field days and conferences. At the Extension Energy and Environment (E3) Summit hosted by Iowa State in September, the team debuted a new



Photo courtesy Amanda Youngquist

Agricultural specialist and STRIPS farmer liaison Timothy Youngquist harvesting prairie seed in Jasper County.

12-minute video produced by the Leopold Center. The video explains what the STRIPS project is and why everyone—or at least the 23 collaborators who were interviewed, including researchers, farmers, farmland owners and representatives from diverse agencies—is so excited about it.

Local and national news covering the STRIPS team and their collaborators is generating further enthusiasm. Bestselling

food writer Mark Bittman called STRIPS "a sustainable solution for the Corn Belt" in an op-ed for the *New York Times*.

Thanks to all of this and a newly redesigned website, the STRIPS team is getting contacted by dozens of people interested in putting even more prairie strips on the land, both within and outside of Iowa. Youngquist says, "We've had people from Nebraska, Michigan, South Dakota, Wisconsin, Minnesota, Missouri, Illinois—pretty much all the states surrounding Iowa—approaching us and asking if we have demonstration sites out there or how they can set up their own."

Every farmer who calls Youngquist has a different reason for putting in prairie strips. One farmer wants to connect a patch of trees to a creek, creating a corridor for wildlife. Another is just starting to take over decision-making for his family farm and told Youngquist that "it's been on his heart a long time" and that he wanted to do *something* to improve the land. Many Iowans are looking at prairie strips as part of implementing the state's Nutrient Reduction Strategy.

An Iowa State graduate, Youngquist grew up in Sac County on a century farm that has been in his family since 1871. He

www.leopold.iastate.edu

STRIPS publications and resources:
www.leopold.iastate.edu/strips-research-team

The research team's website:
www.prairiestrips.org

has done prairie restoration on his family's land and will be farming it one day, so he makes an ideal liaison between the STRIPS researchers at Iowa State and the farmers who are now implementing the practice on their own land. He also functions as a liaison between farmer collaborators so they can learn from one another.

"They really know a lot about the land and about good stewardship," Youngquist says. They also have diverse entrepreneurial spirits. "There's one guy that's doing it one way and another that's doing it completely different, and they're both successful."

Going forward, the STRIPS team will be working with the Tallgrass Prairie Center at the University of Northern Iowa to develop a place for STRIPS farmers to exchange information, ideas and experiences to learn from one another and improve their own practices.

STRIPS the Movie

"It's not like any other conservation practice I've ever encountered," says Clare Lindahl, Executive Director of the Conservation Districts of Iowa.

Find out what makes STRIPS so unique in the new 12-minute film, *Restoring the Balance: Prairie Conservation Strips*, at www.leopold.iastate.edu/stripsthemovie, where you also will find video shorts that dig even deeper into the STRIPS project. In one, researcher Matt Helmers explains why STRIPS could work in Iowa's Nutrient Reduction Strategy. In another, Lisa Schulte Moore discusses STRIPS as "a difference you can see." Two more video shorts are coming soon in 2015.

Want a DVD of *Restoring the Balance*? Contact the Leopold Center by phone at 515-294-9696 or by email at leocenter@iastate.edu to request a copy.

Are you mining soil organic matter?

By GEETHA IYER, Special to the Leopold Center

Conventional wisdom suggests that the most important reason for fertilizing a field is to increase crop productivity. What may be less appreciated—but more important—is not the fertilizer's influence on a plant's harvestable yield, but the residue left behind. Plant residue forms soil organic matter, which increases soil quality and, ultimately, crop yield. New research suggests that conventional corn-soybean systems, managed with synthetic fertilizer alone, do not produce enough plant material to sustain soil organic matter levels.

Iowa State University agronomist Michael Castellano, lead researcher on a recently completed Leopold Center grant project, studied soil properties at four field sites in Iowa, two planted in continuous corn, and two in corn-soybean rotations. Plots at each site have been maintained for 13 years under specific fertilizer regimes—ranging from 0 to 240 lbs of synthetic nitrogen per acre per year—including some maintained at the agronomic optimum of about 150 pounds per acre.

Results of the two-year study show that when managed at optimum levels, continuous corn systems generally produce enough residue—about 3 tons per acre per year—to maintain or increase soil organic matter. Soybeans, on the other hand, create half that much residue, so corn-soybean systems overall do not produce enough bulk matter to replenish soil organic matter stocks in the long term, even at optimum fertilizer levels.

"The corn-soybean system in Iowa is losing organic matter when managed with synthetic fertilizer only, even in the absence of erosion," says Castellano. "Our data highlights the importance of getting as much organic matter into that system as possible."

The project was funded in 2011 by the Leopold Center Ecology Initiative. To control for erosion (the biggest factor in soil organic matter loss), the research was conducted on sites with little or no slopes. The carbon and nitrogen content of soil samples collected in 1999 were compared to samples from 2009. Regardless of rotation type, under-fertilized plots see a long-term reduction in soil organic matter, and over-fertilized plots leach excess nitrogen to the environment.

More detailed analysis also was done on the continuous corn systems to understand what percentage of the soil organic matter was chemically available for plants to take up, and what percentage formed stable aggregates resistant to breakdown by soil microbes. The soil aggregates—because they resist decomposition for many years, sometimes centuries—are critical for long-term carbon and nitrogen sequestration.

On corn-soybean operations, Castellano says the best way to increase soil organic matter, after controlling for erosion or reducing tillage, is to return manures to the soil, since they contain carbon in addition to nitrogen.

Cover crops also may increase soil organic matter levels. At the Marsden Farm, where researcher Matt Liebman has run a diversified cropping systems project since 2002, Castellano collected soil data from a 2-year corn-soybean rotation versus a 3-year corn-soybean-oat + red clover cover crop system.



Michael Castellano

Preliminary analysis confirms previous research suggesting that the 3-year rotation has more nitrogen available for plant uptake,

resulting in greater yields than those observed for 2-year rotations.

Castellano hypothesizes that high-quality manure or crop residue benefits soil quality. He would also like to test the hypothesis that soils with low organic matter levels have lower fertilizer and nitrogen use efficiency than well-managed soils with high organic matter.

Answering these new questions dovetails with Iowa Nutrient Reduction Strategy goals to reduce nutrient loading of waterways. While over-fertilization results in nutrient pollution to air and water, Castellano's work shows that under-fertilization also is detrimental, since it reduces the amount of soil organic matter that acts as a reservoir for nutrients put onto the field. Meanwhile, the "optimum" level of synthetic nitrogen inputs is always variable, depending on factors including field site conditions, management goals and weather conditions.

"There are many sites that don't respond to nitrogen fertilizer in one given year, and we don't even know how to predict those," says Castellano. "There's always going to be uncertainty surrounding whether [farmers] are managing their organic matter optimally."

Given all this variability, he says, manure inputs or cover crops provide a level of insurance against nutrient losses. By improving organic matter, they serve as a buffer against year-to-year uncertainties.

"Cover crops are particularly promising," says Castellano, "because the Iowa Nutrient Reduction Strategy has identified those as a big tool to reduce nitrate loads. So if they also can increase or neutralize the loss of organic matter in a corn-soybean system, there are two factors that really can contribute to long-term sustainability of Iowa's farmlands."



In the foreground is corn grown without synthetic nitrogen fertilizer; the research plots in the background received N fertilizer at the optimum rate.

www.leopold.iastate.edu

More about this grant project:
www.leopold.iastate.edu/grants/e2011-07

Managing nutrients:
www.leopold.iastate.edu/nutrients

With targeting, no more 'random acts of conservation'

By GEETHA IYER, Special to the Leopold Center

New research shows that farmers recognize the importance of “targeting” their conservation efforts onto areas of fields most sensitive to soil erosion and watershed pollution. But with the costs of commodity crop production continuing to rise, and federal policies that favor passive instead of active conservation measures, farmers need more incentives to adopt targeted conservation practices.

In a recently completed project funded by the Leopold Center Ecology Initiative, a research team led by John Tyndall studied central Iowa's Squaw Creek and Big Creek watershed regions to determine which areas are most vulnerable to moving pollutants. They spoke to farmers in their study areas whose crop acres included ideal sites for targeted conservation, to find out how such land management changes would impact them.

“A lot of studies have suggested that the areas that contribute the majority of pollutants are usually less than 10 percent of the watershed,” explains Tyndall, an associate professor in the department of Natural Resource Ecology and Management (NREM). “If those happen to be in areas where there's crop production happening, then those are going to be source areas of sediment, nitrogen, phosphorus and other things that are problematic from a water quality standpoint.

Focusing conservation efforts—and dollars—on these sensitive areas theoretically could address most of the nonpoint source pollution that enters water bodies in the Midwest. Around \$250 million a year are spent on conservation in Iowa, but Tyndall explains that since most efforts are based on farmers approaching conservation agencies, instead of the other way around, the dollars don't often translate into big changes.

With targeting, minimal amounts of land are converted from row crops to perennial vegetation such as prairie or trees. But since the sites aren't chosen arbitrarily, it maximizes the benefits to farms, society and the natural environment.

While it seems like a win-win solution, under current market conditions, farmers have to choose between turning slim profits on conventional crops—where every acre counts—or providing ecosystem services that cannot be “metered” to compensate for production loss, or environmental gain.

Emily Zimmerman, a PhD student working with the farmers' interview data, says that farmers were concerned about

valuing long-term, abstract benefits over the short-term realities of making a living through farming.

“One farmer talked a lot about how he knew that the watershed had impacts on the Gulf,” she says. “But because those impacts were so far removed, in the immediacy of making management decisions to meet his goals, that fell down the totem pole.”

Zimmerman analyzed responses from 33 farmers who agreed to participate in the 2011 project, and found farmers asking questions about potential trade-offs with their corn and bean systems. They wanted to know how much time it would take to convert and manage land for ecosystem services, what the financial costs were, whether there were markets for ecosystem services, and how long it would be before they saw the impact, financial or otherwise, of their efforts.

Tyndall believes that there are potential markets for ecosystem services produced by targeted conservation. He says that when polled, Iowans were willing to pay as much as \$33 a year for conservation benefits, and would support policy shifting in that direction. A related project, funded by the Leopold Center's Policy Initiative in 2012, found that administrators from the Natural Resources Conservation Service (NRCS), the Iowa Department of Natural Resources (DNR) and other institutions also were willing to try out targeted conservation, but currently lack personnel, technical expertise and other resources to do so.

Tyndall is part of a group of Iowa State researchers trying to bridge the gap

between potential and practical. For the 2011 project, target sites were found using newly released, high-resolution topographical data from the Iowa LiDAR Mapping Project. Researchers and farmers from the STRIPS team (see story, page 1) continue to document the ecological, environmental, economic and social value of prairie conservation strips. Another project that began in 2013 is using the Big Creek watershed

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More about these grant projects:
www.leopold.iastate.edu/grants/e2011-15
www.leopold.iastate.edu/grants/p2012-08
www.leopold.iastate.edu/grants/e2013-08

to answer questions about the market value of ecosystem services provided by targeting.

The Big Creek watershed represents a unique opportunity to test a system of payments for ecosystem services. In a 2008 water quality assessment, the Environmental Protection Agency (EPA) declared Big Creek Lake, next to Polk City, “impaired for recreation” after finding unsafe levels of pathogenic bacteria in the water. Tyndall, Zimmerman, lead researcher Lisa Schulte-Moore and others hope to model the financial value of water quality improvements. That way, by opting to do targeted conservation, farmers in the region would be providing measurable services, for which residents of Polk City could pay.

For farmers, a Payment for Ecosystem Services (PES) model would mean that all their land was in production, regardless of what it was growing. But the conservation acres would produce commodities that the rest of the crop field could not—water quality improvements, carbon sequestration and habitat improvements, to name a few.

The results from both 2011 and 2013 projects will be presented to regional agencies and institutions in what Tyndall calls a “grand unified argument” as to why targeted conservation can, and should,

be done across the Midwest. And based on what's already been discovered, he is hopeful of the outcome.

“In all the Corn Belt, I would have imagined that Iowa farmers would be the most recalcitrant to changing anything that they're currently doing, and buying into these new notions of conservation,” he says. “And so if Iowa farmers can do it, I'm just guessing that this is a concept that will fly throughout the whole Corn Belt.”

Best Management Practices for Targeting Conservation*
Landuse Practices
» Extended rotations
» Contour buffer strip
» Multi-purpose prairie strip
Nitrogen/Phosphorus Management
» Four R's (source, timing, rate and place)
» Conservation tillage
» Cover crops
Edge-of-field Practices
» Riparian buffer
» Vegetative filter strip
» Terrace
» Wetland
» Bioreactor

*Most farm plans suggested only 2 or 3 practices.

Getting the numbers for tree crops: Better than you think

Jeff Jensen is pleased with his biggest harvest yet: 800 pounds of in-shell hazelnuts from six acres of trees that he planted on his family farm in northern Kossuth County in 2005. His budget sheets cover years, not months, but acre-for-acre he's convinced that this crop could someday prove more profitable than corn and soybeans.

Jensen is northwest Iowa field coordinator for Trees Forever. He recently completed an economic analysis of six agroforestry crops that can be grown in Iowa: hazelnut, black walnut, chestnut, aronia berry, Christmas tree and elderberry. The project was funded by a 2013 competitive grant from the Leopold Center's Ecology Initiative.

He points to the ecological benefits of perennials on the landscape: improved water quality, reduced flooding and more carbon sequestered, to name a few. "Trees can provide all of these benefits plus nuts, berries, biomass, seed and wildlife," Jensen said. "The idea behind this project was to look at what kind of return to the farm family that these crops could provide, so they would more likely be adopted."

Jensen interviewed more than 20 growers about the opportunities and barriers of

raising and marketing each crop. Enterprise worksheets estimate costs for establishment, labor, maintenance, as well as expected yields and income over 20 years.

And the winners? Aronia berries, Christmas trees, chestnuts and elderberries.

"There's a decent market for aronia and elderberries and the plants are pretty productive," he said, "but you need to be lined up with some sort of marketing cooperative or buyer because these crops need to be processed. It's very difficult to sell them directly to the consumer."

Christmas trees also provide favorable returns, "but the question is whether you are a people person," Jensen added. "You have to be willing to invite people to your farm because you will never be able to compete with growers from Wisconsin and Minnesota."



Jeff Jensen holds several freshly cloned hazelnut trees that he grew by mound-layering four of his best plants. Mound-layering is a low-cost method of propagating the best plant material.


www.leopold.iastate.edu

More about this grant project:
www.leopold.iastate.edu/grants/e2013-18

Trees Forever:
www.treesforever.org

Jensen advises southern Iowa landowners to consider chestnuts, which require well drained and slightly acidic soil. "If you have a site conducive to growing chestnuts, you should be growing them because you can make more money over the long term than corn and soybeans, although the risk generally is higher."

Black walnuts and hazelnuts pose more challenges, but Jensen believes they offer tremendous opportunities. "Hazelnuts have so much potential because you can do many things with them, they are 50 percent oil by weight and the oil is almost identical to olive oil, one of our healthiest oils to eat," he said. "But we do not have the cultivars, other than research trials, to support an industry yet, although new varieties are coming soon."

The project is summarized in a 35-page *Landowners Guide to Perennial Crop Options*, with information about site selection, marketing, cultivars, pest and disease issues, weed control, sources for seedlings and other resources. The guide, six case studies and printed copies are available by contacting Trees Forever.

Find a user-friendly summary of Jensen's project results and a link to the guide on the Leopold Center website.



International honors for Kirschenmann

Leopold Center Distinguished Fellow Fred Kirschenmann has another distinction—the One World Award for Lifetime Achievement. One World Awards (OWA) were created in 2008 by organic food pioneer Joseph Wilhelm, founder of the German company Rapenel Naturkost that sources its organic and fair trade products worldwide. Given every two years, the awards honor individuals, projects and innovative ideas that promote ecological, economic and social improvement and that encourage justice in the world.

Kirschenmann is shown here with Markus Arbenz, executive director of the International Federation of Organic Agriculture Movements (IFOAM) that co-sponsors OWA. IFOAM represents 800 member organizations in 120 countries. Kirschenmann was one of two Americans to receive the OWA honor on September 19 in Germany.



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Highlight Events

More details, events

Check the Leopold Center web calendar:
www.leopold.iastate.edu/news/calendar

Learn about how to get support for events: www.leopold.iastate.edu/grants/education

January 9

The Iowa State Community Design Lab is hosting a day-long workshop on its Agricultural Urbanism Toolkit. The lab has been working in Cedar Rapids, Cresco and Des Moines as part of a Leopold Center Marketing and Food Systems grant, and will share the process and materials that communities can use to strengthen their local food system.

January 23-24

Look for the Leopold Center display at the Practical Farmers of Iowa's annual conference in Ames. The Center also has supported performances of Mary Swander's new play, *Map of My Kingdom*, which will be presented at this event.

February 23, 25

The Leopold Center will participate in Iowa State's annual legislative day at the State Capitol on February 23 and host its own legislative breakfast on February 25.

March 1-7

March 1-7, 2015, is Aldo Leopold Week, honoring the Iowa legacy of this internationally respected scientist and conservationist.

March 2-3

The theme for the 9th annual Iowa Water Conference in Ames is "Currents & Currencies: Trends and Motivators for Better Water Management." The Leopold Center is on the planning committee.

March 11

Environmental activist and author Vandana Shiva will present "The Future of Food" in Ames, hosted by the ISU Sustainable Agriculture Student Association.

In love with soil

"We ask a lot of soil but we often forget to feed it, to house it and to protect



it," says Kate Scow, University of California-Davis soil scientist and key advisor for the award-winning documentary, *Symphony of the Soil*. Scow (right) joined filmmaker Deborah Koons Garcia (left) in Ames September 20 to discuss how science and film were used to share the powerful story of soil. Garcia and Scow are with ISU Distinguished Professor John Pesek, who led Iowa State's Department of Agronomy from 1964 to 1990. This year the Pesek Colloquium on Sustainable Agriculture was combined with a lecture series honoring his predecessor, William H. Pierre. Pesek also received the American Society of Agronomy's first Presidential Award for his contributions to soil science. 2015 is the International Year of Soils.

See a video of the event on the Leopold Center's website.