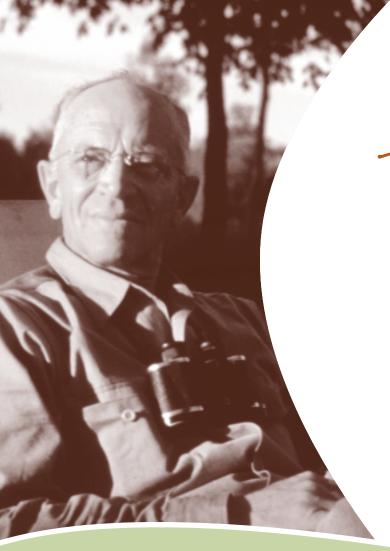


Engaging
2004-2005 annual report

Griculture



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.

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

# Table of Contents

| Letter from the Director             | Sustainable Swine Production          |
|--------------------------------------|---------------------------------------|
| Advisory Board                       | Long-term Organic Work                |
| Staff5                               | Spencer Award                         |
| FY05 Budget5                         | Marketing and Food Systems Initiative |
| Farewell to Dr. Duffy6               | Ecology Initiative                    |
| Endowment Fund                       | Policy Initiative                     |
| ISU Animal Science Faculty Addition7 | Initiative Grants                     |
| PFI8                                 | Old Competitive Grants                |
| Agriculture of the Middle10          | Special Projects4                     |

#### **EDITED BY** Mary Adams

**GRAPHIC DESIGN BY** 

Juls Design, Inc. Ankeny, Iowa

#### **PHOTOS BY**

Leopold Center staff except where noted. The Leopold Center for Sustainable Agriculture explores and cultivates alternatives that secure healthier people and landscapes in lowa and the nation.

Information for this report was compiled by Leopold Center staff with the help of its researchers and educators, who are committed to improving lowa agriculture and the lives of lowans.

Iowa State University does not discriminate on the basis of race, color, age, religion, national origin, sexual orientation, gender identity, sex, marital status, disability, or status as a U.S. veteran. Inquiries can be directed to the Director of Equal Opportunity and Diversity, 3680 Beardshear Hall, (515) 294-7612.

# fetter from the Director



Frederick Kirschenmann

hat will be the basis for the next "era" of agriculture? This question engages our thinking at the Leopold Center. And we're not the only ones wondering about the best path for farmers of the future.

In his *Culture and Agriculture: An Ecological Introduction to Traditional and Modern Farming Systems*, anthropologist Ernest Schusky ponders how long our industrial era of agriculture (which he calls the "neo-caloric" era) can last. He uses the term "neo-caloric era" because our modern farming systems are almost entirely driven by calories (mostly fossil fuel-based) that we extract from nature and import to the farm. He calls them "old calories" because they have been stored up in nature over several billion years. Consequently, we will some day run out of them, hence his question.

As farmers watch their costs for fertilizer, pesticide, equipment and diesel fuel – all fossil fuel-based inputs – rise dramatically, Schusky's question is no longer merely an academic exercise. While there are many reasons for the

fossil fuel price increases, the fundamental truth is that we have reached – or will shortly reach – peak global oil production even as we are seeing dramatic increases in demand. Chevron, a major energy company, is using ads to tell us that, "It took us 125 years to use the first trillion barrels of oil. We'll use the next trillion in 30."

At the Leopold Center, we believe that one of our options is production systems that rely on internal biological synergies. Such ecologically-based production systems can reduce reliance on outside inputs. These new systems are more diverse, complex, and knowledge intensive, so this change will not be easy.

But, some farmers have already begun making this transition and researchers are exploring new models. The key question, as Masae Shiyomi and Hiroshi Koizumi put it in the introduction to their book *Structure and Function in Agroecosystem Design and Management*, "Is it possible to replace current technologies based on fossil energy with proper interactions operating between crops/livestock and other organisms to enhance production?"

At the same time that we attempt to answer that question, we need to work on improving net farm income. Farmers have been experiencing declining net income and have little flexibility to make transitions. So, at the same time that we explore alternative production systems, we need to explore markets that enable farmers to produce and retain more value on the farm. And, of course, we need to explore policy options that assist farmers in making such production and marketing transitions.

We continue to try and do our part to facilitate this transition to a post-fossil fuel era by encouraging research in our three initiatives:

• Ecology, which explores alternative production systems based on biological synergies that are less costly to farmers and to the environment,

- Marketing and Food Systems, which explores alternative markets that enable farmers to produce more value and retain a larger share of that value on the farm, and
- Policy, which explores policy options that allow policy-makers to fashion new farm policies that will assist farmers in making the transition to these new farming and marketing systems.

Our 2005 Annual Report outlines some of the research that we have supported in each of these areas. We hope you find the report useful in your own work. As always, we invite your comments.

> Frederick Kirschenmann Director

## Leadership change at the Center

s this annual report reaches you, the Leopold Center has undergone a significant leadership reorganization that will shape its activities for the next two years. Effective November 1, 2005, Dr. Jerry DeWitt, Professor of



Jerry DeWitt

Entomology and Extension State Sustainable Agriculture Coordinator at Iowa State University, assumed the position of Interim Director for the Leopold Center. He succeeds Dr. Fred Kirschenmann, who has accepted a new position as Distinguished Fellow for the Center. This position will allow Kirschenmann to continue to pursue broad-ranging, national interests that will have a direct impact on Iowa and Iowa agriculture. DeWitt brings to the Center a long, distinguished resume, featuring both state and national experience in guiding sustainable agriculture organizations. This alteration in Center staffing allows two recognized leaders in sustainable agriculture to serve the Center. Their combined efforts will continue to engage the Center nationally while directly serving local Iowa agricultural needs.



Advisory Board pictured from left to right: front row - Doug Beckman, Laura Jackson, Neil Hamilton, Marvin Shirley Second row - Lyle Asell, Jim Penney, Steve Howell, Russ Brandes, Wendy Wintersteen, Jennifer Steffen. Third row - Maury Wills, Paul Mugge, Tom Fogarty.

# Advisory Doard

#### Lyle Asell

Administrator, Iowa Department of Natural Resources

#### Doug Beckman\*

Farmer, Iowa Farm Bureau Federation, Glenwood

#### Russell Brandes\*

Farmer, Soil Conservation Committee, Hancock

#### **Kelley Donham**

Professor of occupational and environmental health, University of Iowa

#### **Thomas Fogarty**

Professor of geography, University of Northern Iowa

#### **Neil Hamilton**

Professor of agricultural law, Drake University

#### Stephen Howell

Director, Plant Sciences Institute, Iowa State University

#### Jennifer Steffen

District Soil and Water Commissioner, Birmingham

#### Erin Irish

Professor of biological sciences, University of Iowa

#### Laura Jackson

Professor of biology, University of Northern Iowa

#### Wes Jamison

Professor of agriculture, Dordt College, Sioux Center

#### Paul Mugge

Farmer, Practical Farmers of Iowa. Sutherland

#### Mary Jane Olney

Administrative division director, Iowa Department of Agriculture and Land Stewardship

#### Jim Penney

Manager, Heart of Iowa Co-op, Agribusiness Association of Iowa, Ames

#### John Sellers, Jr.\*

Farmer, Soil and Water Conservation Districts, Corydon

#### **Marvin Shirley**

Farmer, Iowa Farmers Union, Minburn (chair)

#### Allen Trenkle

Professor of animal science, Iowa State University

#### Wendy Wintersteen

Senior associate dean, College of Agriculture, Iowa State University

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

# Financials

**OPERATIONAL EXPENDITURES** 

| Salaries & Benefits \$536,812.45               |
|--|
| Travel   |
| Meeting Expenses 5,821.68                      |
| Services, Information & Communication88,761.56 |
| Supplies 12,035.47                             |
| Utilities/Maintenance & Repair 4,381.23        |
| Miscellaneous                                  |
| Total Operational                              |

Expenditures ...... \$675,626.45

#### RESEARCH AND GRANTS

| Competitive Grants \$1,059,898.61                                    |
|--|
| Wallace Chair Support 20,000.00                                      |
| LTAR Support 50,000.00   |
| Agricultural Systems - Management & Performance Initiative 25,000.00 |
| Grape and Wine Program 25,000.00                                     |
| Assoc Director's Support 10,000.00                                   |
| Total Research   |

and Grants ...... \$1,189,898.61

#### **INITIATIVE COMMITMENTS**

| Ecological Systems Research                    |
|--|
| Marketing & Food<br>Systems Research 51,089.44 |
| Policy Research                                |
| Total Initiative Commitments\$274,281.59       |
| TOTAL \$2,139,806.65                           |

# Center Staff

Frederick Kirschenmann Director (leopold1@iastate.edu)

Michael Duffy
Associate Director\* \*\* (through June 30)

Mary Adams Editor\* (madams@iastate.edu)

Andrew Hug
Program Assistant\* (ahug@iastate.edu)

Sheryl Johnson
Secretary/Office Manager
(sliohnso@iastate.edu)

Laura Miller
Communications Specialist\*

Jeri L. Neal
Ecological Systems and Research Program
Leader (wink@iastate.edu)

Rich Pirog

Marketing and Food Systems Program

Leader\*\* (rspirog@iastate.edu)

\*part-time or shared appointments
\*\*partial Extension appointment

Ty 05 July-June

# Center bids farewell to D. Duffy



Michael Duffy

ichael Duffy, who had been associate director of the Leopold Center for much of its history, resigned at the end of June 2005. He will pursue other opportunities in the ISU economics department where he is a professor, and with the ISU Beginning Farmer Center, where he will serve as director after being professor-in-charge for several years.

In his official resignation statement, Duffy stated that his primary interests have always been teaching, research, and outreach. He is well-known for his yearly surveys of farmland values in Iowa and his successful work with ISU Extension farm management specialists. His position as half-time associate director at the Center had become so heavily weighted toward administrative and managerial duties that he felt he was no longer able to do justice to other facets of his professional career.

Among the immediate tasks that will occupy him are developing an economics course for the ISU Graduate Program in Sustainable Agriculture and an undergraduate course in land appraisal. Duffy, who also led the Center's Policy Initiative, will continue to be available to the Center for consultation on policy matters. He noted that the decision to leave the Center was not easily arrived at because "I believe strongly in the mission of the Center and I have a great deal of vested interest in its success."

The depth and breadth of Duffy's knowledge, contacts, and experience will be sorely missed at the Center. Staff members assembled a multiple-page list of tasks he routinely covered as a half-time employee. Plans for hiring his successor focused on how many people would be needed to fill in the gaps left behind by his departure.

"I BELIEVE STRONGLY IN THE mission of the Center

AND I HAVE A GREAT DEAL OF VESTED INTEREST IN ITS SUCCESS."

### Friends help the Center create an

# Endowment Fund

enerous donations from supporters around the country were designated as part of a "Friends of the Leopold Center Endowment" account created in March 2005. The initial \$50,000 used to form the endowment came from monies raised during fundraising efforts the Center undertook in 2002 and 2003. The fundraising campaign was begun following a \$1 million transfer of funds from the Center's Agricultural Management Account to the State of Iowa's general fund due to the State's budgetary problems that year.

Donors at that time were assured that if the Legislature restored funding to the Center

(which it did in subsequent years), a portion of their gifts would be invested with the ISU Foundation to provide a permanent source of support for the Center's activities. Center director Fred Kirschenmann noted, "Each year we will put at least 50 percent of the gifts we receive from friends into the endowment."

The ISU Foundation administers the account and the Center director will take charge of determining and applying the funds to be distributed by the endowment account.



EACH YEAR WE WILL PUT AT LEAST

50 percent OF THE GIFTS WE RECEIVE

FROM FRIENDS INTO THE ENDOWMENT.

# Center supports ISU animal science faculty addition

Since the departure of ISU animal behaviorist Don Lay in 2001, the alternative swine production work on campus has been hampered by an inability to apply information about how an animal's experience within its environment can affect its performance



Anna Johnson

in production systems. When the ISU animal science department hired Anna Johnson as the new animal behavior specialist in April 2005, the Center agreed o provide \$20,000 per year for three years to support graduate student assistance for Dr. Johnson. She will use the funds to begin her research program focused on several aspects of animal behavior. In addition, she has initiated conversations with Iowa farmers to determine what animal welfare and animal behavior issues they consider critical.

# Ou-Farm Research by Practical Farmers of Iowa uses Leopold Center support

since 1997, the Leopold Center has contributed \$50,000 annually to the work of Practical Farmers of Iowa on farms across the state. One of the most visible uses of the money is the support for field days where PFI farmer-cooperators share their findings and experiences. In FY2005, 19 PFI-managed field days drew 1,270 people. Topics included production and marketing of flax, low-linolenic oil soybeans, and grass-finished beef; corn breeding for nutritional quality; herd health in alternative swine production; natural aromatic compounds for managing soybean aphid; systems approaches to weed management; the Green Lands Blue Waters campaign for perennial landscapes; and the Conservation Security Program.

In addition, Leopold Center funding allows individual producers to carry out trials on topics that interest them or that may have wider appeal but lack earmarked support. Most external funding is meant

to support a specific project, and such grants are invaluable because they permit PFI to thoroughly study a problem. However, there isn't grant funding available for every question. Moreover, PFI has developed some highly creative agricultural practices because individual inspiration was confirmed by on-farm research. Help from the Leopold Center has kept that door open for farmers to pursue innovative practices. Among them:

In 2004, **Richard and Sharon Thompson**, Boone, continued to perfect and document a cover cropping practice that works well in their ridge-tillage system. Rye (*Secale cereale L.*) is seeded on the ridge tops in fall or early spring, which allows the planter to remove the rye mechanically at the time of row crop planting. The rye builds soil tilth and provides a more intense version of the same benefits for which weeds can be utilized. As Richard Thompson says, "Use early weeds to control later weeds." In separate trials, the

Thompsons seeded rye before planting corn and before planting soybeans. In the soybean trial, the rye had no effect on soybean yield. However, the rye cover was associated with a drop in corn yield that was highly significant from a statistical standpoint. Thompson suspects this was a case of "allelopathic suppression," a characteristic for which rye is known. (Allelopathy is an antagonistic reaction between plants, generally mediated by allelochemicals that can remain in the soil even after the plants are removed.) Thompson's experiments suggest that rye has allelopathic effects on corn but not on soybean, and he plans to use the cover cropping practice accordingly.

Doug Alert and Margaret Smith, Hampton, researched another weed management option – flame cultivation. In wet springs, when the rotary hoe and harrow are ineffective, the flamer can provide critical early control of weeds right in the row, where the cultivator won't reach. But as Doug noted, "having attended several meetings and being told that flaming will increase corn yields even with no need for weed

Young pigs cluster on the straw beneath a heat lamp on the Kyle Graney farm.



control, I thought this needed checking out." The 2004 trial answered the question. There were few weeds overall, and there was no difference in the yield of flamed corn and the control, which was treated the same except for flaming. The trial suggests that with flame cultivation costing nearly \$9.00 per acre, strategic use of the practice is the best bet for farmers.

Producers on diversified farms are always looking for ways to make use of interrelationships among elements of the system, as the interest in alternative feedstocks demonstrates. Paul and Karen Mugge, Sutherland, investigated oats as a finishing ration for their hogs. Oats (or oat) is a highly regarded component of the diet of young pigs because its fiber helps to forestall diarrhea. But while oat is inexpensive compared to other grains, it is not as dense an energy source as corn. The Mugges' trial was the most recent of several that PFI research

cooperators have carried out to evaluate this alternative swine feed in the context of their own systems.

Leopold support to PFI also helped Paul Mugge work with ISU agronomist Lance Gibson to assess another alternative feedstock, triticale. New releases of this small grain, a cross between Durum wheat and rye, feature improved yields and disease resistance. In 2004 Mugge's spring triticale yielded 2,980 lb per acre, not statistically less than the 3,300 lb/acre oat harvest. And because triticale's feed value is equivalent to corn, the outcome favored the triticale. Mugge also grew the higher yielding fall triticale, which yielded 5,040 lb (90 bushels) in 2004.





### Leopold Funding

In addition to enabling farmers to test their own ideas or helping out an ISU scientist working with a modest budget, Leopold Center support is an important source of leverage in proposals to other funding agencies. One such project involves the health of pigs in alternative production systems and is funded by the SARE (Sustainable Agriculture Research and Education) program of the U. S. Department of Agriculture.

The need for this program emerged through the Pork Niche Market Working Group (PNMWG), that was originally led jointly by the Leopold Center and Practical Farmers of Iowa and that has received support from the W.K. Kellogg Foundation, among others. The Research Alliance for Farrowing has been intensively monitoring swine systems representative of those producing pork for sustainable and organic markets. As a result of this project, ISU and field veterinarians have begun work on a Herd Health Guide for Alternative Swine Systems, something producers and veterinarians nationwide may find useful. Collaborators in the SARE project have been motivated to secure a grant from the National Research Initiative to focus further on swine health management and record keeping. (See page 20).

Leopold Center support for the PFI Farming Systems Program contributes on many levels of on-farm research and to collaborations that further that research.

# Agriculture of the Middle expands project activities



FOR MORE INFORMATION,
SEE THE WEB SITE AT
WWW.AGOFTHEMIDDLE.ORG

everal Leopold Center staffers are involved in the multi-state Agriculture of the Middle project intended to help the disappearing sector of mid-scale farms/ranches and related agri-food enterprises that are not in a position to successfully market bulk commodities or sell food directly to consumers. The project shares several common goals with the Leopold Center. Fred Kirschenmann serves as convening chair of the Development Phase Coordinating Committee, Rich Pirog is a member of that committee, and Mike Duffy participated in writing research papers for the program.

The two-year-old Agriculture of the Middle project is entering a development phase with three strategic dimensions:

New business and marketing strategies. Collaborators will build business networks or "value chains" that link farms/ranches-of-the-middle with food system partners to meet a growing demand for differentiated, high-quality food products.

Public policy changes. Included will be policy changes that can be secured in the relatively short term and can directly affect middle market development. Also sought are more systemic policy changes over an extended period of time that will fully equalize economic environments for farms/ranches-of-the-middle.

Research and education support. Scientists associated with the initiative and with the land-grant university academic community will provide research and education support for the business and policy strategies, at both the regional and national levels.

Work of the Leopold Center's three initiatives, particularly the value chain efforts in the Marketing and Food Systems Initiative, serves as a model for the national-level work of Ag of the Middle.

# Center continues efforts to promote sustainable swine production



he Leopold Center has a long, successful history of working with Iowa's family farm pork producers. Ten years ago the Leopold Center sponsored a conference on alternative swine production practices. It was so successful that a follow-up event was held in 1999. In addition, the Center provided startup funding to a group of ISU faculty (informally known as the "Hoop Group"). The name was chosen to reflect their first studies of how hooped buildings might be used for inexpensive, yet practical swine housing and the group branched out to look at a variety of ways to raise pork in a more sustainable, healthier manner.

Even though the Center ended its base financial support for the Hoop Group in 2002, the Center continues to assist the group in securing other funding, particularly from the U.S. Department of Agriculture. The group will continue to research health, efficiency, and biosecurity management for swine.

The work has expanded to explore hoop uses for other animals.

The Center was pleased to be a major sponsor of a September 2004 national conference and international symposium hosted by the Hoop Group – "Hoop Barns and Bedded Systems for Livestock Production."

The event attracted 232 people from ten countries, all interested in the applications of these unique systems for hogs, dairy and beef cattle, as well as other meat animals. Sixty international researchers participated in the second-day session, looking for ways to raise pork more efficiently in their countries.

The conference featured sessions on how hoops relate to animal welfare and process-verified or niche market livestock production using hoops. Leopold staffers Rich Pirog and Mike Duffy spoke at this event.

THE LEOPOLD CENTER HAS A long, successful history
OF WORKING WITH IOWA'S FAMILY FARM PORK PRODUCERS.



# Jong-tern Organic Work Continues



he Leopold Center provides \$50,000 annually for basic research and demonstration efforts performed by the ISU organic agriculture program staff. Program leader Kathleen Delate, an ISU horticulture and agronomy associate professor, has used the funds to start and sustain important experiments that will aid Iowa's growing number of organic producers.

The majority of these organic experiments are being conducted at ISU's Neely-Kinyon Research Farm near Greenfield. Delate and her research associate, Andrea McKern, also oversee projects at other ISU research farms and at sites operated by cooperating farmers. Cindy Cambardella, a soil scientist at the National Soil Tilth Laboratory in Ames, is another frequent collaborator along with farm superintendents at the ISU research sites.

Results from 2004 growing season projects at the Neely-Kinyon research farm:

Comparison of organic and conventional crops at the Long-term Agroecological Research Site (LTAR).

Established in 1998, this program compares the long-term performance of four kinds of conventional and organic crop rotations. (Treatments at the LTAR site, replicated four times

in random design, included these rotations: conventional Corn/Soybean, organic Corn-Soybean-Oats/Alfalfa, organic Corn-Soybean-Oats-Alfalfa-Alfalfa, and Soybean-Wheat.)

Organic corn yields averaged 194.3 bushels/acre and organic soybean yields averaged 42.6 bushels/acre. The organic C-S-O/A-A corn plot yields at 202 bushels/acre were significantly greater than the organic C-S-O/A corn yields, but equal to the conventional C-S yields. The organic C-S-O/A and C-S-O/A-A soybean yields were significantly greater at 45.4 and 43.7 bushels/acre, respectively, than the conventional C-S yield of 39.3 bushels/acre. There were no significant yield differences between oat rotations.

Pest populations remained low in 2004, with no corn borers observed in any plots on July 6. Bean leaf beetles did not reach economic threshold levels in 2004. Soybean cyst nematodes were also below economic threshold levels, with no significant differences among treatments.

Sweet corn variety and pest management trial. Organic sweet corn can be successfully grown in Iowa, based on the state's agricultural resources and extensive experience with field corn production. One of the key pests in organic sweet corn production is the corn earworm. Earworm control was improved through the addition of a certified organic

spreader-sticker in preliminary tests in 2001. This project investigated variety selection for early markets and the efficacy of the naturally occurring soil bacterium, *Bt* (*Bacillus thuringiensis*), for improved pest management of the corn earworm.

Two varieties of sweet corn, 'Ambrosia' and 'Merlin,' were planted on May 17, 2004. Weed management included two rotary hoeings, two cultivations and hand weeding. Organic sweet corn quality was excellent in 2004, however, plant populations were decreased from low emergence in wet weather. A significantly higher plant population was found in the 'Ambrosia' plots compared with 'Merlin'. Subsequently, higher yields were harvested from 'Ambrosia' plots compared to 'Merlin'. Broadleaf weeds became a concern in areas of low plant populations. There were no significant differences in grass weeds among treatments or varieties and in broadleaf weeds when checks were made.

Earworm populations at the time of this experiment were low overall. As a result, there were no significant differences in earworm damage among treatments or varieties. There was a trend towards higher numbers of earworms in the 'Merlin' ears, however. Evaluation of organic pest management treatments for bean leaf beetle and soybean aphid. Bean leaf beetles have continued to be a problem for organic tofu soybean producers throughout the Midwest because of the resulting seed staining, which can downgrade the quality of the soybeans at market. Since 2000, Delate's group has evaluated organically approved treatments for bean leaf beetle and fungal control.

In 2001, the group began to study natural spray treatments that could be used in certified organic production for control of soybean aphid.

In 2004, Pioneer 9305 soybeans were planted. There were four replications of the four treatments, all of which were compared with a control. Soybeans were harvested in October 2004. The percentage of stained soybeans was determined by counting the number of stained soybeans in a 60-gram sample that was randomly collected from the harvest of each plot.

Very few beetles or aphids were apparent until July 30 – two weeks later than the 2003 season. Populations were significantly less than in 2002 and in 2003. As a result of low beetle populations, there were no differences in beetle numbers among treatments. Soybean aphid populations did not exceed 20 aphids/plant over the entire season, leading to no significant differences in insect numbers between the control and other treatments. Yields were not affected by





pest management techniques, with control plots averaging 49 bushel/acre, compared with a 51 bushel/acre average over all other treatments. There were no significant differences in grain quality among treatments in 2004. Both yields and grain quality were excellent for organic, tofu-type soybeans.

Evaluation of flax varieties for certified organic production.

Flax is an ancient crop that had been grown in Iowa for many years, but was displaced by the emphasis on commodity corn and soybeans. Flax has many uses, including industrial oils from oilseed flax, food-quality flaxseed oil, and linen products, fiberboard and paper products from the straw. Flaxseed oil is high in omega-3 fatty acids, which are associated with lowered risk of heart disease and lowered blood cholesterol levels. Organic flaxseed oil can now be processed in Iowa to be sold around the world.

In 2004, CDC Bethune and Hanley varieties of flax were planted. On August 18, plant maturity data was taken by counting the number of fully mature plants out of ten randomly selected plants per plot. Flax was harvested on August 30.

Although there was a trend toward greater plant populations in the Hanley variety, the difference was not significant. On July 1, the flax was significantly taller in the CDC Bethune variety. Flower number was not significantly different, although there was a trend toward a higher number of

flowers in the CDC Bethune variety. On August 18, the Hanley variety had significantly more mature bolls than the CDC Bethune variety. Lodging was not a problem in either variety. No significant differences were found in biomass dry weight, lodging, or yield in 2004.

Effect of cover crops for weed pest management in organic vegetables. Weeds constitute a major challenge for organic vegetable growers. Organic weed management options include tillage, mulches, flame burning, and allelopathic crops, such as rye. In 2003 and 2004, researchers examined the effect of a rye cover crop on weed populations, crop stand and yield of organic green beans and peas. In addition to the weed-suppressive effect of winter rye, the cover crop can be used to meet certified organic requirements for soil-building practices.

Winter rye was no-till drilled into the rye treatment plots in October 2003. Plots were seeded with peas on June 2 and with beans on June 11. The main treatments in the 2004 project were rye cover crop tilled into soil prior to vegetable planting, and a control (no rye).

In 2004, excellent organic green bean yields were obtained in both treatments. There was a trend toward higher plant stands in green beans that were planted with a rye cover crop. Green bean yields also were significantly greater following the rye cover crop compared to plots with no

THE LEOPOLD CENTER PROVIDES

\$50,000 annually

FOR BASIC RESEARCH AND DEMONSTRATION EFFORTS

cover crop. This result contrasted with first-year results where no significant differences were observed in stands and yields with or without a rye cover crop. Producers must adequately kill the cover crop prior to vegetable planting, however, or crop stands and subsequent yields could be decreased. Competition from any remaining residue from the rye cover crop was not apparent in either year of the experiment.

Results from these experiments were very encouraging for organic green bean and pea producers. With the exception of rabbits browsing on pea plants in 2004, green bean and pea yields were excellent in 2003-2004, with no apparent nutritional, insect, or disease problems. While there were no significant differences in yields and weed populations between treatments in 2003, the overall benefit of planting a rye cover crop prior to green bean and pea planting was evident in 2004. Because weed management is recognized as one of the most pressing needs of organic farmers, a rye cover crop can assist in managing weed populations, particularly in years where weeds are plentiful due to high rainfall. Broadleaf weeds were effectively managed in both years in both pea and green bean plots with the rye cover crop. Grass populations were not considered a problem in either year, and were not affected by the rye cover crop. Although weed populations were not affected by the rye cover cop in 2003, any effort towards reducing weed seed densities will lead to an increase in yields in the long term.

#### Organic research at other sites in 2004

Evaluation of corn, soybean, and barley varieties for certified organic production—Crawfordsville. In 1998 a long-term organic crop rotation experiment was initiated at the Southeast Research Farm to examine the effects of organic practices on crop yields, soil quality, and grain quality.

Because a soil-building crop rotation is required for certified organic crop production, these organic fields follow a rotation of corn-soybean-barley/red clover. Results reported here represent the seventh year of production which includes two cycles of the three-year crop rotation.

Treatments in 2004 at the Southeast Research Farm consisted of three varieties of corn and soybeans and four varieties of barley. No insecticides, fungicides, or herbicides were applied in keeping with organic standards. Weeds in corn plots were managed through two rotary-hoeings and two row cultivations. Corn plots were harvested on October 21, 2004.

Soybean plots were planted to a cover crop of rye (1 bushel/acre) the previous fall. The rye was killed by chisel plowing and disking on April 30, 2004. Three organic soybean varieties were planted on May 27. Soybean weeds were managed through two rotary-hoe operations and two row cultivations. Soybean plots were harvested on October 5, 2004. Barley was planted at 2 bushel/acre on April 5 in plots measuring 20 x 40 ft. After barley was harvested on July 15, red clover was planted as a cover crop in that field.



AGRICULTURE NOT ONLY gives riches to a nation,
BUT THE ONLY RICHES SHE CAN

CALL HER OWN

- SAMUEL JOHNSON



There were no significant differences among corn varieties in stand counts, weed counts, percent borer damage, and stalk nitrate levels in 2004. Soybean plant populations after two rotary-hoeings were significantly higher in the 2FN93 and 2A83 plots. There were no significant differences among varieties in soybean broadleaf and grass weeds on both sampling dates. Although there were no significant differences in soybean insect populations and staining, there was a trend toward higher bean leaf beetle populations on September 19 in the 3F24 plots as well as a higher percentage of staining. Organic corn yields ranged from 156 bushel/acre to 169 bushel/acre, but there were no significant differences among varieties. Soybean yields were significantly higher in the 2FN93 plots compared with the other soybean plots. Barley yields were significantly lower in the 'Conlon' plots compared with the other three barley variety plots.

Evaluation of popcorn, adzuki beans and triticale under certified organic production – McNay Trial. The McNay Memorial Research Farm dedicated approximately two acres of a five-year-old forage field (bromegrass and alfalfa) for this long-term project in Chariton, Iowa, in 1999. In 2004, after two cycles of a three-year rotation, the organic fields were transitioned to organic adzuki bean, popcorn, and triticale as potential alternative crops for southern Iowa.

Winter rye was broadcast on corn plots at a rate of one bushel per acre to serve as a ground cover to prevent erosion and mitigate weed populations in 2004 bean plots. Triticale was planted on April 8, 2004 and 'Mammoth' red clover was interseeded in the triticale plots on April 9. Adzuki beans

were planted on May 17, 2004. Four Crookham popcorn varieties were planted on May 17. Popcorn was rotary-hoed on May 24 and cultivated on June 24. Adzuki beans were cultivated on June 24. Adzuki bean plots were "walked" (large weeds removed by hand) from July 8-14 and from August 13-24, per local organic practices to remove any potentially staining weeds prior to harvest. Triticale was harvested by combine on July 27, 2004. Popcorn was harvested on October 15. Adzuki beans were harvested on November 8, 2004.

No significant differences were observed among popcorn varieties in plant stands or broadleaf and grass weeds. No corn borers were detected on July 8.

Adzuki bean emergence and survival rates after rotary hoeing were not consistent, with plant populations significantly greater in the plots planted at 139,089 and 119,263 seeds/acre compared to the 101,303 and 80,928 seeds/acre rates. No significant differences were observed among seeding rates in broadleaf or grass weeds in the adzuki plots.

No significant differences were observed in popcorn yield, but there was a trend toward greater yield in the 97474 variety compared with the other varieties. There were significantly greater adzuki bean yields in the two higher planting rates compared with the two lower planting rates. There were no differences in triticale yields based on previous tillage treatments. Popcorn variety and adzuki bean plant population number did not significantly impact soil carbon and nutrient concentrations.

# 2004 Spencer Award honors Dick and Sharon Thompson



Left to right: Mike Duffy, Dick and Sharon Thompson, Marvin Shirley.

wo longtime, outspoken advocates of sustainability in farming – Dick and Sharon Thompson of Boone County – were honored with the 2004 Spencer Award for Sustainable Agriculture. The Thompsons' long, fruitful association with the sustainable agriculture community has been marked by their willingness to share what they've learned via a variety of publications, field days, farm tours, and traveling to make presentations about what they've discovered in nearly 50 years of working with plants, land, and animals.

The Thompsons operate a 300-acre crop and livestock farm in central Iowa. They use a ridge-till system and five-year rotation of corn, soybean, corn, oats, and hay with rye as a fall cover crop. They are advocates of the important role animals play in achieving agricultural harmony. Dick says, "Including the cow in the farm operation keeps the farm and communities in balance."

The Thompsons have a long history of supporting alternative agricultural practices. Their first experiments began in 1968 and they have meticulously documented the results of the many farming innovations they have tested. Each year they publish a 200-page report on *Alternatives in Agriculture*, which details their research and demonstration results. They also helped found Practical Farmers of Iowa, which recently celebrated its 20th anniversary.

The Spencer Award recognizes those who have made a significant contribution toward the stability of Iowa's mainstream family farmers. It honors Norman A. and Margaretha Geiger Spencer, who farmed near Sioux City for 40 years. The award was endowed by the Spencer family in 2002.

THE SPENCER AWARD RECOGNIZES THOSE WHO HAVE MADE

A SIGNIFICANT CONTRIBUTION TOWARD THE STABILITY OF

IOWA'S MAINSTREAM family farmers.

# Marketing and Food Systems Initiative



elping farms become economically sustainable is one facet of the Center's original mission. In keeping with that goal, the marketing and food systems initiative works to:

- Research and test new marketing strategies and business structures that allow Iowa's small and midsize producers to retain more of the value for food, fiber, or energy produced with high standards of environmental and community stewardship;
- **Develop farmer opportunities** for greater levels of ownership, equity, and/or influence within the value chain; and
- Research and document economic, environmental, and community impacts of local and regional food, fiber, and energy value chains to determine best how farmers, processors, and agricultural entrepreneurs can use this information in their market messages.

Initiative leader Rich Pirog reflects on the past year's activities, "The year was marked by growth and increased momentum with a large number of new projects underway through the Marketing and Food Systems Initiative grants

program and the Kellogg-funded Value Chain Partnerships for a Sustainable Agriculture project. These projects increase our partnership base and help us reach further to obtain the business and value chain expertise needed to help Iowa farmers and farmer networks succeed."

## Kellogg Value Chain Partnerships project continues aggressive schedule

The Value Chain Partnerships for a Sustainable Agriculture (VCPSA) project that Pirog coordinates concluded its third year of funding from the W.K. Kellogg Foundation. Among the significant project accomplishments:

 Continued to nurture three working groups that have involved more than 40 Iowa-based businesses, institutions, and organizations: the BioEconomy Working Group (BWG) led by ISU Extension specialist Jill Euken; the Regional Food Systems Working Group (RFSWG) led by Rich Pirog; and the Pork Niche Market Working Group (PNMWG) led by Gary Huber from Practical Farmers of Iowa.

- Awarded 10 grants to the RFSWG members and six grants to BWG members.
- Engaged senior vice presidents of the SYSCO Corporation in sharing views on how to best design business relationships among farmers, groupings of farmers, and a large food service corporation, with an initial emphasis on niche pork production.
- Began forming a new working group devoted to flax (i.e., organic flax used for flaxseed oil).

Peter Goldsmith presented an ISU seminar on "The Role of Group Action in the Post-Modern Food System: Working with Buyers" in February 2005.

He told his audience about new generation cooperatives that approach sales from the perspective and needs of the buyer rather than the seller.



Peter Goldsmith

He shared information on his research about structural change in the agri-food supply chain and its effect on agribusinesses and farmers. (Goldsmith is a National Soybean Research Laboratory Fellow in the Department of Agricultural and Consumer Economics at the University of Illinois-Urbana/Champaign.)

In June 2005, three new graduate assistants were hired for the fall 2005 semester. They will pursue a MBA degree with a minor in sustainable agriculture. These students will be involved with the BioEconomy, Regional Food Systems, and Flax working groups.

The Pork Niche Market Working Group (PNMWG), the first of the VCPSA working groups to be formed, funded several new projects in May 2005. A Spencer, Iowa, veterinary clinic is developing and distributing a guidebook of key herd health best management practices for farmers who are raising hogs without antibiotics. The Iowa Pork Industry Center (IPIC) received a grant to implement a new niche pork production assistance project. ISU Extension Swine Field Specialist Larry McMullen is developing a report on production and marketing topics related to the Berkshire pork breed.



Fall 2005 graduate assistants from left to right: Scott Kincaid, Andrea Spiker and Kory Beidler.

### Marketing and Food Systems Initiative

The PNMWG also provides a forum for groups and individuals interested in niche pork to exchange information and strategize ways to work together to address key challenges facing niche pork supply chains. Using funds from various sources, the PNMWG has, to date, awarded grants totaling \$100,343 for research that addresses those challenges.

The Pork Niche Market Working Group was instrumental in obtaining a two-year, \$400,000 National Research Initiative grant through the U.S. Department of Agriculture. The Iowa Pork Industry Center, the ISU College of Veterinary Medicine, Practical Farmers of Iowa, swine producers, veterinarians, and ISU state and field extension specialists will be working together on the project to help niche pork producers. Work will focus on:

- developing optimal herd health intervention and prevention strategies for certified organic and antibiotic-free hogs,
- identifying key production issues affecting profitability and developing strategies to improve performance, and
- employing outreach strategies to enhance the long-term viability of niche pork farmers and farmer-led niche pork companies.

In addition to IPIC, the ISU College of Veterinary Medicine, and PFI, grant partners include ISU Extension, the ISU Hoop Structures Research Group, the Leopold Center, the University of Nebraska's Department of Animal Science, and the Iowa Farm Business Association.

#### The BioEconomy Working Group (BWG),

organized in August 2003, is a consortium of individuals and groups who have an interest in developing economically, environmentally and socially sustainable biobased businesses in Iowa. Funding is provided by the W.K. Kellogg Foundation, the Iowa Energy Center, Cargill Dow, the Leopold Center, and the U.S. Department of Energy. BWG has recruited a group of committed people who are poised to make a difference in how value chains develop for biobased businesses in Iowa. In addition, the group has developed a sustainability matrix for emerging bioeconomy value chains in Iowa.

The BioEconomy Working Group partnered with many other organizations to plan and host the 2005 Biobased Industry Outlook Conference in Ames. The group also was instrumental in presenting the 2004 Biobased Industry Outlook Conference.

The group funded six projects in March 2005, including two associated with flax and one that explores the use of switchgrass as a feedstock for biobased plastic. Another went to a company that is investigating the use of corn-based yogurt containers. Yet another grant will identify potential collection sites along the Iowa Northern Railway for crop residuals. The group is developing a logistics system capable of moving 80,000 to 500,000 tons of corn stover to a processing facility.

In March 2005, the BWG sponsored a tour of Kenaf Industries of South Texas. The group of Iowans visited Charles (Chuck) Taylor, a kenaf producer in McAllen, Texas, to discuss growing and processing kenaf. While in Texas the group toured kenaf fields and processing facilities, and viewed kenaf harvesting machinery.

The Regional Food Systems Working Group (RFSWG), organized in October 2003, supports education, conducts research, and facilitates partnerships to increase investment and support of community-based, economically sustainable, and environmentally and socially responsible regional food enterprises. Group leaders recruited people committed to make a difference in how investment and technical support are coordinated to develop regional food system businesses in Iowa.



More than 40 people regularly participate in this group. Among them are small business owners; producers; business, agriculture and engineering professors from ISU, community colleges and other Iowa universities; as well as representatives from several governmental agencies. The working group also funds projects that support its mission including these in progress in 2004-05:

- Investigation of strategic partnership opportunities with Iowa convenience store retailers for Iowabased value-added food products
- Linking five- and seven-a-day fresh produce serving equivalents for Iowa consumers with economic benefits for farmers
- Marketing research: Value-added dairy production
- Buying and eating (W)Right in north central Iowa: The untold growing story of local food in Wright County
- Characterizing optimal business conditions for commerce between farmers and SYSCO - Phase II
- Examining awareness of and support of regional food systems in Iowa

- · Local farm and economy analysis for northeast Iowa
- Farmers market economic impact survey analysis
- Evaluating economic impacts of local food purchasing in several market channels in Black Hawk and surrounding counties

Kay Palan, ISU marketing professor, conducted a statewide telephone survey and focus groups on regional food systems to provide baseline data on consumer perception of regional food systems. While a large majority of those surveyed were unfamiliar with regional food systems, they did offer the opinion that the health and safety aspects of locally grown and processed foods are of more value to Iowans than the economic benefits that communities might derive.



#### Farmers' markets pack an economic punch

Farmers' markets may be having a bigger impact on Iowa's economy than anyone expected. An economic analysis funded by the Regional Food Systems Working Group was conducted by ISU economist Dan Otto and graduate student Theresa Varner. They used data collected by the Iowa Department of Agriculture and Land Stewardship during the 2004 market season.

Based on interviews with more than 4,500 customers, these markets generated \$20.8 million in total sales in 2004. Those sales, in turn, resulted in an additional \$12.2 million of economic activity, of which \$4.3 million represents the supplies and services purchased by vendors and growers, and \$7.2 million in induced (payroll) effects. The analysis showed that farmers' markets represent an estimated 325 jobs in Iowa, plus an additional 146 full-time jobs created by the secondary impacts of the farmers' markets.

IOWA FARMER'S MARKETS GENERATED



### Marketing and Food Systems Initiative

#### Marketing and Food Systems Initiative Activities

ineteen new projects (totaling \$400,000 in first-year monies) and five special projects were funded by the Marketing and Food Systems Initiative for FY 2005. (See the descriptions in the section on Initiative grants, page 34.)

#### Looking for food stories

A Marketing and Food Systems grant to folklorist Riki Saltzman allowed her to seek out compelling stories about Iowa's "place-based" foods that have both geographic and cultural connections. There are obvious examples such as Amana meats and Maytag blue cheese, but Saltzman searched for the more elusive food products or crops that met at least two of these criteria:

- Ingredients must be grown and processed in Iowa,
- It must have some claim to a unique Iowa heritage – historical, ethnic, ecological, or geographic, or
- It must have a story related to it that makes the Iowa connection clear.

#### **Encouraging Iowa's vineyards**

A grant from the Marketing and Food Systems Initiative has helped fund a three-part video series on "The Total Wine Package." Viewers learn about opportunities in the wine industry, the science of viticulture, and how to develop a wine marketing strategy. The videos can be accessed on-line from the Iowa Agricultural Marketing Resource Center (www.agmrc.org/agmrc/commodity/fruits/wine/winery feasibility.htm).

#### How much produce does Iowa need? And where?

On an earlier Marketing Initiative project, ISU's Center for Transportation Research and Education came up with data on county-level retail sales and production estimates for selected fresh fruit and vegetables in Iowa based on various user inputs and assumptions. The wealth of data they obtained led them to work with the Leopold Center on the next step – creating an innovative "Produce Market Potential Calculator" for a multitude of Iowa fruit and vegetable crops. A prototype of the marketing tool was developed, tested, and refined between May 2004 and May 2005, with projected limited public release of the program in October 2005.



#### Safer food handling

Three ISU Extension publications on food safety tips for farmers who direct market their products were developed with a grant from the Marketing and Food Systems Initiative. Readers can find out about on-farm food safety practices and how to document them, appropriate use of cleaners and sanitizers, and hints for employees who handle the produce. (See www.extension.iastate.edu/publications/pm1947).

#### Yogurt ingredients are well traveled

The components of that 8-ounce carton of strawberry yogurt can qualify for frequent flyer miles. The primary ingredients travel more than 2,200 miles before they reach the supermarket dairy case. A report by Rich Pirog, Marketing and Food Systems Initiative program leader, and ISU student Andrew Benjamin, calculated the weighted total source distance (WTSD) for the milk, sugar, and strawberries found in a typical container of strawberry yogurt processed in Des Moines, Iowa, and shipped to area food stores.

#### Lessons from the Lake Erie Concord Grape Belt

Heritage development sounded like a winning plan for farmers in the Concord grape growing region along Lake Erie in western New York and eastern Pennsylvania. Once a grape growing center for the Welch's grape juice operation, the local producers are now seeking a "heritage area" tag (and possible



Duncan Hilchey

funding) from the state of New York that would allow them to promote agritourism, branding of local products, and historical attractions and activities based on the grape growing and winery traditions of the region.

Duncan Hilchey, a regional planner for the Community, Food and Agriculture Program (CFAP) at Cornell University reported on these plans. He is the author of *Growing Home*:

Community development strategies for sustaining local agriculture and his visit to Iowa for several informational seminars was sponsored by the Marketing and Food Systems Initiative and the Regional Food Systems Working Group.

#### How to market Muscatine melons

The perennial favorite Iowa summertime treats – Muscatine melons – have fallen on tough times due to increased labor costs, price competition from imports, and limited processing options. A report sponsored by the Marketing and Food Systems Initiative and written by food consultant Sue Futrell and ISU Extension Farm Management Specialist Craig Chase, *Muscatine Melon: A Case Study of a Place-based Food in Iowa*, makes the case that savvy marketing that builds on the unique qualities and geographic identity of this traditional Iowa crop may make it a place-based alternative for producers in Muscatine County. The report is available at www.leopold.iastate.edu/research/grants/files/ 2004-MSP9\_melon.pdf.

#### Iowa's "Tasty" heritage

Today Iowa is known for its production of a few commodity crops, but once it was home to a wide array of products and food traditions. A report by Rich Pirog, Marketing and Food Systems Initiative leader, and ISU student intern Zach Paskiet, explores how Iowa's rich and intricate food production heritage may offer clues to creating profitable niche markets and new food enterprises. Iowa community food festivals covered in the report provide promising venues for agritourism efforts. The 45-page report, *A Geography of Taste: Iowa's Potential for Developing Place-based or Traditional Foods*, presents a colorful look at Iowa's food past — and future. View the report at www.leopold.iastate.edu/ pubs/ staff/taste/ taste.htm

#### Marketing plans for Iowa farmers

Growing saleable products is a good thing only if you know how to sell them. The Marketing and Food Systems Initiative funded an experimental marketing class taught by Kay Palan and John Wong in the ISU College of Business that gave agriculture and business students a chance to help producers devise plans to market their wares more successfully. The class paired student teams from the Colleges of Agriculture and Business with entrepreneurial farmers who use sustainable production practices and had a unique product destined for a niche market. The farmers and students met and discussed their marketing problem, then the students developed a formal business proposal that covered the scope of the project, steps, and timeline. Palan said, "It really is a win-win situation for the students as well as the businesses because our students need practical experience."

Protecting a special brand of lamb Canada's Charlevoix lamb is a high-quality, local forage- and grain-finished product raised by the St. Lawrence River. Much prized by local chefs, Charlevoix lamb producers were plagued by inferior substitutes that appropriated their good name and diluted the product reputation. Area farmers banded together to protect their specialty product with a government-protected brand name. The Marketing and Food Systems Initiative and ISU's Center for Agricultural and Rural seminar by Charlevoix Agritourism coordinator Mario Duchesne and local development counselor Nancy Chabot on their trail-blazing program to secure the cachet of the area's lamb as a premium-branded, place-based product.



# Ecology Initiative

WE NEED A WORLD WHERE SOCIETY

RECOGNIZES AND REWARDS FARMING

FOR multiple goals-

ECONOMIC, ENVIRONMENTAL,

HUMAN HEALTH, AND SOCIAL.

— JERI NEA

he Ecology Initiative supports research and development of ecologically friendly systems that are more resilient and less costly to farmers, communities, and the environment. This includes identifying how farming practices can:

- use free ecosystem services,
- · enhance biodiversity, and
- apply natural processes as models to increase agricultural productivity.

Ecology program leader Jeri Neal says, "The challenge is essentially Aldo Leopold's concept of people as members and plain citizens of the biotic community. What does it mean to bring this 'to ground'? It means we have to describe – and then support – a transition to a new generation of farming systems. This is a task for community stakeholders and policy makers as much as farmers and researchers. We need a world where society recognizes and rewards farming for multiple goals – economic, environmental, human health, and social. It sounds too big to even think about, but there's a saying that the whole is greater than the sum of its parts. That's true for ecology, both human and wild, and gives me hope that our many small steps are indeed critical work for the greater vision."

Seventeen projects were funded by the Ecology Initiative during FY 2005. (See the descriptions in the section on Initiative grants, page 32.)

#### Growing grassland agriculture

Iowa farmers are taking a closer look at grass-based agricultural systems for many reasons: potential for increased income, lower front-end capital investment, efficiencies in intensive rotational grazing systems, growing consumer interest in grass-fed meat products, restoration of wildlife habitat for hunting, preservation of Conservation Reserve Program (CRP) gains, and assorted (but not always fully appreciated) conservation benefits. Numerous grass-related research and demonstration initiatives are going on in surrounding states, and in Iowa there is considerable interest in how to improve the viability of grass-based agriculture. The Ecology Initiative has responded to this percolating interest by creating a program area that is focused on research and education to support farmers considering forage production, grassland, and grazing.

In November 2004, the Leopold Center and its grass advisory committee selected a south central Iowa farmer to coordinate activities and research related to the new grassland agriculture program area. John Sellers, Jr., of Corydon has agreed to work with the Center to develop





John Sellers, Jr.

a program area to promote grasslands as part of a healthy agricultural landscape. He has a 12-year-old management intensive grazing regimen on his farm. Sellers also has grown switchgrass for biomass and wildlife, and worked as field coordinator for the Chariton Valley Biomass Project.

The Center currently has five research projects related to forages and grazing.

These efforts build on 22 earlier projects that relate directly to grass, grazing, and maintaining animals on the land. With the new emphasis on grass-based agricultural systems, the Ecology Initiative will encourage additional research and demonstration in this area.

Funding has been received from the Wallace Genetic Foundation to begin work on a revision of *Grass*, published by the USDA as the 1948 Yearbook of Agriculture. The landmark volume placed grass-based systems into the ecology of agriculture, and addressed the role of grass as it related to production, practice, and philosophy. An editorial committee headed by former ISU agronomy professor Walt Wedin has been recruited to work on the new edition of this text.

#### ISU systems work complements Ecology Initiative

The Leopold Center is helping to support the ISU College of Agriculture's newly formed research and extension initiative, "Agricultural Systems-Management and Performance." Rick Cruse, ISU agronomy department faculty member and a former project investigator for the Center, serves as coordinator for the COA program.

The Ag Systems Initiative is an interdisciplinary science-based research program that focuses on spatial and temporal variability and interactions between field and watershed components while seeking profitable solutions to future problems. Among its five focus areas are:

- Watershed designAgroecological mapping
- Plant database and risk analysis
   Multi-functional use
  - Temporal and spatial design



Projects in this initiative will focus on improving soil and water resources and associated landscapes through designing systems that make better use of ecological relationships to improve economic and/or resource use efficiencies. System performance indicators will include agroecological and hydrological function, nutrient utilization efficiencies, and economics.

## Ecology Initiative



#### Re-integrating Crops, Livestock

The Ecology Initiative continues to participate in a larger, multi-state Initiative for Future Agriculture and Food Systems (IFAFS) Program sponsored by the U.S. Department of Agriculture, Re-Integrating Crop and Livestock Enterprises in Three Northern States. This four-year project involves the collaboration of 10 institutions across three states in the northern United States. Maine represents the Northeast, Michigan represents the Great Lakes, and Iowa represents the Midwest.

Iowa components of the project focused on Shelby and Crawford counties and include analysis of community networks needed to support integrated crop and livestock systems, exploration of interactions among farming practices, environment and profitability, and the development of a sophisticated web-based model for simulating integrated farming operations and their likely impacts on environment (see Internet farming options, I-FARM, on page 29).

Currently, the Ecology Initiative is supporting the formation of a national advisory group to facilitate integration and use of the I-FARM model with existing agencies and commonly used farm and environmental planning tools. Robert Anex, ISU faculty member in Agricultural and Biosystems Engineering, is taking the lead in this effort.

Another component of this project supported by the Ecology Initiative was the development of a complementary economic model that assesses price and production risks for Iowa family-sized farms looking at alternative crop and livestock enterprises (see Competitive Grants, Ecology Initiative, Lawrence, page 33).

#### Green Lands Blue Waters

The Ecology Initiative partners with multiple universities, agencies, and nongovernmental organizations in the multi-state Mississippi River Basin program, Green Lands Blue Waters (GLBW). GLBW is a long-term comprehensive effort whose mission is to support development of and transition to a new generation of agricultural systems in the Mississippi River Basin that integrate more perennial plants and other continuous living cover into the agricultural landscape.

The primary objective is to develop and promote profitable enterprises that serve both environmental and economic goals. Financial support to launch the consortium, whose leadership is located at the University of Minnesota, was provided by the McKnight Foundation. The Ecology Initiative is providing part-time support for a project coordinator through USDA funds, (see Special CSREES Projects, Morse, page 28).

One project of the consortium, funded by the W.K. Kellogg Foundation and managed by the Mississippi River Basin Alliance (MRBA) in conjunction with the Institute for Agriculture and Trade Policy (IATP) and the Leopold Center, is to organize a stakeholder

network in the basin. Elements include survey and mapping the nutrient management efforts at all scales throughout the basin, stakeholder workshops, white paper, and web site.

Consortium partners work together to create and provide presentations at various Midwestern conferences and workshops that address water quality and landscape use, and to submit proposals for funding for watershed level work. Participating states each explore their own design for participating.

The Ecology Initiative, in conjunction with the ISU College of Agriculture, has taken the lead in organizing an Iowa-based GLBW stakeholder steering committee. Committee members represent a wide cross section of agencies and individuals involved in Iowa agriculture,

and currently are meeting quarterly to learn more about viable alternatives that farmers can use to increase both environmental and



economic productivity, and to eventually discuss possibilities for partnerships in watershed level work.

Special funds support a diversity of work in Iowa
The Ecology Initiative receives special research funds
through the USDA-Cooperative State Research,
Education, and Extension Service (CSREES) for
on-the-ground work that is located primarily in
Iowa and that will support and enhance the longterm GLBW vision of a new generation of ecologically
sound and economically profitable farming systems.
Among the broad-based set of goals are to:

- Optimize agricultural production on specific landscapes,
- Facilitate land use change to create ecological buffers and water retention areas, and
- Diversify land use to increase perennials for biobased and energy crops.

Projects funded through the CSREES grant include:

Matt O'Neal, Entomology, Iowa State University, principal investigator; and Jeremy Singer and Keith Kohler, USDA-National Soil Tilth Laboratory, co-investigators. Research has three objectives: identify living mulch species that are profitable in a corn-soybean-forage cropping system, measure the insect natural enemy community in soybean, and test promising treatment(s) at the field level.

Jim Cooper, Prairie Rivers Resource Conservation and Development, coordinator. Creates a case study, based on a pre-existing local example of voluntarily implemented viable water management practices, of the social and economic climate that underpinned these particular community-driven land use changes. The case study will be used to develop estimates of associated costs and benefits and incentive gaps for duplicating this kind of watershed work.

GLBW'S MISSION IS TO SUPPORT DEVELOPMENT OF AND

TRANSITION TO a new generation

OF AGRICULTURAL SYSTEMS IN THE MISSISSIPPI RIVER BASIN.



## Ecology Initiative

#### **CSREES-funded projects**

Cathy Kling, Center for Agricultural and Rural Development (CARD), Iowa State University, principal investigator. In conjunction with Prairie Rivers RC&rD, Iowa Soybean Association, The Nature Conservancy, Iowa Department of Natural Resources, local Soil and Water Conservation Districts, the Iowa Farm Bureau Federation, farmers, and others. Conduct baseline work in the Boone watershed to integrate soil and water conservation models with economic models, with a long-term goal of estimating costs and incentive gaps that might encourage or discourage landowners to adopt specific water and soil management land use practices.

Jim Fawcett, crop specialist, Iowa State University Extension, principal investigator. Assesses the feasibility of double-cropping field peas in southeast Iowa to diversify farm cropping systems while increasing farm income.

Robert Karp, executive director, Practical Farmers of Iowa, principal investigator. Taking the lead role in creating a coordinating organization for Iowa stakeholders to participate in the multi-state coalition Green Lands Blue Waters.

James Russell, Animal Science, Iowa State University, principal investigator. Explore a fall-calving system with cows grazing stockpiled pastures and test supplementation with distillers' grains. This system has the potential to expand options for producers to keep animals on the farm, capture profitability, and support the overall project's long-term goals of diversity on the landscape.

Steve Morse, Senior Fellow and Endowed Chair in Agricultural Systems, University of Minnesota, project leader for Green Lands Blue Waters, principal investigator. Minnesota has undertaken the key leadership role in organizing the Green Lands Blue Waters regional consortium and a series of small, leveraged projects. Funds will be used to provide logistical, management, and administrative support and focus to the overall Green Lands Blue Waters initiative, the program leader, and the Consortium board.

Diane Anderson, Center for Survey Statistics and Methodology (CSSM), Iowa State University, principal investigator. Help design and conduct a mail survey to sample 4,500 producers living in three Midwestern states to measure cover crop use and impediments to adoption among crop producers in the Midwest. Cover crops are an important tool to explore for improving the diversity and resilience of Midwestern landscapes.

Nancy Grudens-Schuck, Agricultural Education and Studies, Iowa State University, principal investigator. Conduct a GLBW evaluation based on five questions: (1) to what extent have participants improved their understanding of key issues, (2) to what extent have learners improved their connection to reliable sources of knowledge and support about sustainability, (3) to what extent are participants ready and willing to apply new knowledge, (4) what outcomes resulted from the project for participants and their organizations, and (5) how effective and acceptable were project methods for different types of participants.



#### Linking ecology and policy

Many farmers find themselves enmeshed in a cycle where they specialize and farm more acres in order to increase production and improve their economic situation, while policymakers respond by trying to support them with policies that reward this amplified production. Another look at this risky way of doing business was aired in "Science, policy and feedback loops: Applying ecological principles to sustainable agriculture policy," presented at ISU by Stewart Smith, University of Maine economist, in January 2005. Smith looked at ways to break the existing debilitating cycle and examined the role that public policy can play in reintegrating crops and livestock on the agricultural landscape.



Stewart Smith

#### Tenets of sustainable design

David Orr, noted environmental commentator and director of the environmental studies program at Oberlin (Ohio) College, offered ISU a look at designing sustainable systems in a series of seminars and speeches on campus in September 2004. His visit was sponsored by the Ecology Initiative, along with the ISU College of Design and Department of Landscape Architecture.

#### Internet farming options

I-FARM, an innovative web-based simulation program, allows producers to view a farm's impact on the environment. The Ecology Initiative has been an Iowa partner in the USDA-funded, three-state project that seeks to integrate farming systems that use both animals and crops. Farmers who have used the program at field days and initial learning sessions manipulate I-FARM to create "what-if" scenarios on virtual or actual farms that contain both crop and livestock enterprises. It also allows users to evaluate the impact of conservation incentives on the "virtual" farmsteads.



Russ Brandes (left) and Matt Liebman.

FOR MORE INFORMATION
ON I-FARM VISIT
HTTP://I-FARMTOOLS.ORG

# Policy Initiative

he Policy Initiative conducts research on policy options to foster a sustainable agriculture. Among its goals are to help beginning farmers establish ecologically sound and profitable farming and marketing operations; reward farmers for producing public goods such as ecologically restored landscapes, wildlife habitat, recreational areas, etc.; and modify regulations that put locally owned micro-enterprises at a competitive disadvantage.

Michael Duffy, who was Policy Initiative program leader and Center associate director, commented: "Policy is an extremely important area with respect to sustainable agriculture and the practices farmers are using. The current commodity programs determine, to a large extent, what is planted and how. The programs also influence many of the agronomic decisions being made. In addition to influencing the production, policy influences the market. State inspections, what is permitted and so forth, are all important marketing considerations influenced by policy.

"The Center does not want to be perceived as espousing one particular policy over another, but it does want to research the issues and provide the policy makers with the information they need to make informed decisions." Eight projects were funded by the Policy Initiative during FY 2005. (See the descriptions in the section on Initiative grants, page 38.)

#### Future agricultural policy for the world

"Toward a Global Food and Agricultural Policy" was a first effort by the Policy Initiative to formulate some alternative thinking that would inform the 2007 Farm Bill deliberations. The white paper was spawned by a meeting of representatives from several organizations: Traci Bruckner, Center for Rural Affairs; Neil Harl, Iowa State University; Paul Johnson, farmer and conservationist; Daryll Ray, University of Tennessee; Mark Ritchie, Institute for Agriculture and Trade Policy; plus Mike Duffy and Fred Kirschenmann from the Leopold Center. The group looked at a variety of critical issues and gauged how they shape agricultural policy. Ultimately, they concluded that there was a need for a world agricultural policy that includes energy (both the production and use) as a key element. U.S. price and income policies play a large role in global agriculture, as do resource and conservation needs. The changing structure of U.S. agriculture also affects how the nation deals with rural communities and their problems.

The white paper is available on the Center's web site (www.leopold.iastate.edu/pubs/staff/policy/globalag.pdf).

#### Organic farmers surveyed on program rules

How do Iowa's organic farmers view the National Organic Program that has standardized organic regulations? A study funded by the Policy Initiative found that the state's 400 organic certified farmers see two significant challenges: one is finding a market that will support the value-added costs of organic products and the other is being able to produce enough goods to meet the demand for organic products.

#### Cooperatives offer hope to Midwest organic growers

Premiums for organic products make them an attractive option for Midwest organic producers. A project supported by the Policy Initiative suggested that organic farmers could further enhance their profit margins by joining together in cooperatives to market their specialty products. Richard Levins, a Minnesota agricultural economist, conducted the study and reported that farmers marketing their organic grains through a cooperative (OFARM) appear to have received much higher prices for nearly all their crops.

## Taking the pulse of Community Supported Agriculture (CSA)

There are more than 1,000 Community Supported Agriculture (CSA) enterprises in the United States, including 60 in Iowa. The Policy Initiative used grant funds to survey 144 Midwestern CSAs to see how they were faring. The resulting report (Community Supported Agriculture in the Midwest United States: A regional characterization) found that CSA operators were often motivated by environmental stewardship and community involvement as well as a fairly attractive average net return per acre on their investment. The study was written by Mike Duffy, Policy Initiative leader, and Erin Tegtmeier, formerly a Leopold Scholar and an alumna of the ISU Graduate Program in Sustainable Agriculture.

#### Ag Policy Summit supported by Policy Initiative

With less than two years to go before the next farm bill makes it way through Congress, there are endless possibilities and options for those crafting the bill. Seeking to get a head start on the process, Iowa State University organized a conference on "New Directions in Federal Farm Policy: Issues for the 2007 Farm Bill." Policy Initiative program leader Mike Duffy was on the planning committee for the summer 2005 agricultural policy summit held in Ames. In addition, the Center provided significant financial assistance for the event.

#### The true costs of agriculture

A study conducted by Mike Duffy and Erin Tegtmeier examined the external costs of U.S. agriculture – the costs to clean up the agricultural pollution or environmental degradation caused by agricultural practices. The results, which were published in the *International Journal of Agricultural Sustainability*, estimated that U.S. crop production alone generates external costs ranging from \$11.92 to \$38.74 per acre. They suggested that creative policy actions could be formulated to acknowledge and internalize the externalities of the production practices.

#### Impact of land ownership on conservation

The percent of Iowa's farmland owned by people over the age of 75 doubled from 1982 to 2002. Today, almost one-fourth, 24 percent, of Iowa's farmland is owned by people over 75. Another 24 percent is owned by people between the ages of 65 and 74. This means that almost half the land is owned by people over the age of 65. There is strong evidence that as these people die they pass on the land to their children, and the children are increasingly living out of state. The percent of Iowa's farmland owned by people whose primary residence is not Iowa rose from 6 percent to 19 percent between 1982 and 2002. Today, more than half the land is rented and there is a predominance of cash rents.

Against this backdrop, the Policy Initiative started a research project designed to answer the

questions, "So, what if the land ownership is changing? What difference does it make, especially as it relates to the use of conservation practices?"

Greene County was chosen as the preliminary county to examine. One section from each township was randomly selected and all the landowners in that township were sent a mail survey. In all, there were 72 owners in the 16 selected sections. Responses were received from 32 of the owners, for a 44 percent response rate.

This was a preliminary study. More observations will be needed, but the initial analysis of the data shows that most people are holding the land because of income or a long-term investment. There were, however, 16 percent of the respondents who indicated that they were holding the land for sentimental reasons. There does not appear to be a large difference in the conservation practices used, whether or not it is an owner-operator or a landlord situation.

The Greene County results will be used to further refine the questionnaire. The next step is to survey more counties to obtain a broader cross-sectional representation of Iowa counties and to increase the sample size to allow for greater statistical analysis.



# Competitive grants support initiative research, demonstration, and outreach

The Leopold Center initiatives support research projects in these areas:

**Ecology:** development of ecologically friendly systems that are more resilient and less costly to farmers, communities, and the environment;

Marketing and food systems: promotion, development, and discovery of markets for food, fuel, and fiber that support vibrant local communities and protect natural resources; and

Policy: analysis and development of new food, agriculture, and natural resource policies that are community, farmer, and environmentally friendly.

#### **Ecology Initiative**

**Alternative farrowing systems** during cold weather, 2 years M. Honeyman, ISU Research Farms: J. Harmon. ISU agricultural and biosystems engineering; and J. Kliebenstein, ISU economics (ending 2005) Many of the new pork niche markets have requirements

for farrowing outdoors or indoors in bedded pens, which makes winter farrowing difficult and results in a scarcity of marketable fresh pork during the summer. This project will

document successful management practices, design appropriate technology, and develop budgets and sensitivity tables for producers interested in winter farrowing. Investigators believe they have achieved a significant production breakthrough with a combination of modified huts and a radiant heater.

#### Assessment of triticale varieties for swine feeding performance and tolerance to late planting, 2 years L. Gibson and J.L. Jannick, ISU agronomy; and M. Honeyman, ISU Research Farms

Four triticale feeding trials (two winter and two summer) will be conducted to evaluate pig performance in hooped housing. Investigators have seen both economic and environmental advantages from growing triticale in lowa, but lack information on swine feeding performance. Tests will be conducted at three sites to determine varietal adaptation of triticale in Iowa cropping systems.

Biological control of the soybean aphid in organic and sustainable sovbean production systems, 3 years (ending 2005) J. Zhu, ISU entomology and R. Exner, **Practical Farmers of Iowa and ISU Extension** Sprays have been the primary treatment for potentially damaging soybean aphid infestations. This project explores biological management options in field situations, and

educates farmers about different options for managing levels of aphid predators as well as aphid populations. Early work has identified several predatory insects and parasitoids other than the originally targeted lacewings and ladybeetles. Researchers also have identified several aphid and soybean plant-associated volatiles that were attractive to the aphid predators. Preliminary field work using the attractants has shown that the application of dispensers containing attractants of beneficial insects reduces soybean aphid populations significantly, and also increases yield.

#### Developing ecologically sound and profitable fertilizer and manure phosphorus management strategies, 3 years A.P. Mallarino, ISU agronomy

Project goals are to evaluate long-term impacts of a strictly response-based, low-input phosphorus fertilizer management program for corn and soybean; assess early plant availability of poultry manure phosphorus; and use the Iowa P-Index to estimate field phosphorus loss under alternative phosphorus management practices. The resulting data will be used to develop more efficient management guidelines for phosphorus.

#### **Developing potatoes with horizontal** resistance to the Colorado potato beetle, 3 years

#### D.G. Fisher, Maharishi University of Management, Fairfield

The investigator will continue ongoing research to develop potatoes with horizontal resistance to the Colorado potato beetle. The investigator theorizes that a process of recurrent mass selection can be used to build up resistance while preserving high yield.

#### **Economically optimal enterprise mix for lowa farms, 1 year** J.D. Lawrence, ISU economics (ending 2005)

A computer model will be developed to incorporate price and production risk for alternative crop and livestock enterprises when a certain set of farm constraints (labor, capital, solvency, land characteristics) are 'imposed' on Iowa family-sized farms operating with and without government program assistance. The model may help evaluate the strengths and weaknesses of diversified farming operations under different economic and resource conditions.

#### Establishment of a field school for weed ecology and management, 3 years

#### M. Liebman and R.G. Hartzler, ISU agronomy

Investigators will collect data on weeds, soils, and crops from both large and small field plots under two-, three-, and four-year rotations and organize an interactive farmer/practitioner-focused field school. Educators will target weed ecology and management, with an emphasis on decision-making skills and capacities and easily adaptable, broadly applicable techniques and models.

#### Forage double-cropping demonstration, 3 years I. Lamb, Iowa Native Lands; S. Barnhart, ISU agronomy; and M. Honeyman, ISU Research Farms

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

#### **Integrating hunting and grazing Loess Hills** and south central lowa on-farm management experiences, 1 year (ending 2005)

#### J. L. Pease and A. L. Major, ISU natural resource ecology and management

Two landowners are cooperating in this on-farm work to measure activities of birds in rotationally grazed warm and cool season grass pastures. The investigators are collecting real-life data in an attempt to validate prior experimental work on managing forages to benefit both livestock and wildlife.

#### Integration of natural seed treatments in organic and open-pollinated corn systems, 2 years

#### S. Goggi, ISU Seed Science Center and K. Delate, ISU horticulture and agronomy

The essential oils of aromatic plants will be screened for their antimicrobial properties against seed- and soil-borne corn pathogens. The investigators hope to find effective biological seed treatments that will enable farmers to improve early-planting seedling establishment and grain yields in alternative cropping systems (specifically those with low chemical inputs, such as sustainable, organic, and open-pollinated corn).

#### lowa pawpaw trial maintenance, 3 years P. O'Malley, ISU Extension, Johnson County

## In 1999 and 2000, plantings were established near

Columbus Junction and Nashua, Iowa to assess the viability of pawpaws as a horticultural crop for upper Midwest production. This project will provide production maintenance and recordkeeping for the previously established lowa pawpaw trials, and begin the fruit evaluation phase of the trials.

#### Quantifying the role of riparian management to control non-point source pollution of pasture and cropland streams, 3 years

#### J. Russell, ISU animal science and R. C. Schultz, ISU natural resource ecology and management

This large-scale project will comprehensively study, both on-farm and on research farms, the sediment and phosphorus losses for a number of management variations on cattle grazing systems in and around riparian areas. The investigators are refining ongoing research to obtain better data on phosphorus movement associated with pastures and grazing systems.

#### The role of herbaceous woodland perennial diversity for improving nutrient uptake capacity of riparian areas, 1 year C. Mabry McMullen and J.R .Thompson, ISU natural resource ecology and management (ending 2005)

Investigators will quantify the nutrient uptake capacity of understory perennial herbaceous plants and compare the nutrient uptake capacity of a well-established understory to that of a degraded woodland understory. The low diversity of herbaceous perennials in grazed and degraded lowa riparian forests in Iowa may be associated with increased nutrient

loss, and, if so, it is believed that nutrient retention could be significantly enhanced by the restoration of native perennial herbaceous species.

#### Survey of mycorrhizal symbioses at Neal Smith National Wildlife Refuge, 2 years I. Lamb, Iowa Native Lands; P. Drobney, Neal Smith National Wildlife Refuge; and L. Tiffany, ISU ecology, evolution and organismal biology

Staff will conduct a preliminary survey of mycorrhizal (root fungus) associations in remnant and reconstructed prairies at the Neal Smith National Wildlife Refuge to establish baseline data and experimental protocols for future investigation of this biological component of the soil. The symbiotic relationships between plants, soil, and fungi and their contribution to plant and soil vitality are poorly understood, and this project offers a starting point for understanding soil functionality in perennial plant systems.

# Using the past to plan the future: Retrospective assessment of landscape and land use changein Clear Creek watershed, 1 year L. A. Schulte, A. Rayburn, and L. Merrick, ISU natural resource ecology and management

Researchers will investigate landscape and land use change in Clear Creek watershed at four time periods and using three ecological and social measures: land cover, stream sinuosity, and housing density. The effect of many types of land management decisions can be assessed through historical reconstruction. Reconstructing the past also provides a richer understanding of what future watershed potentials may be.

# Variations in water and nutrient cycling and soil properties during agricultural landscape restoration, 5 years H. Asbjornson, ISU natural resource ecology and management; M. Helmers, ISU agricultural and biosystems engineering; M. Liebman, ISU agronomy; L. Schulte, ISU natural resource ecology and management; and R. Kolka, USDA Forest Service. North Central Research Station

The research team will examine differences in nutrient, water, and carbon storage and output for selected mixtures of annual and perennial plant communities, and then provide educational opportunities about the results. They theorize that producers can reduce nutrient loads, improve water management, and maintain or improve agricultural productivity by strategic integration of perennial plants in agricultural landscapes.

## Winter grazing of stockpiled grass-legum forages to reduce costs of developing beef heifers, 1 year (ending 2005) J. R. Russell, ISU animal science

The investigator will evaluate cow performance, feed requirements, and costs for maintaining pregnant two-year cows by grazing stockpiled grass-legume forage vs. feeding hay with corn gluten supplementation. The project is collecting a third year of data; two mild winters may have positively influenced recommendations from the first two years of work.

#### **Marketing and Food Systems Initiative**

## Analyzing local food systems for success: Naming and graphing entrepreneurial and community-based agricultural linkages, 2 years

C. Smith, National Catholic Rural Life Conference, Des Moines Food system maps are being developed for Adair, Greene, Guthrie, and Shelby Counties. The maps will provide information about where value is added in the local food system, where gaps in the system could provide opportunities for local farmers and entrepreneurs, and how local food resources and expertise can best be tapped and utilized.

#### NEW Assessing the market potential for goat meat among recent immigrants to Siouxland, 2 years B. Wells and H. Lewis, ISU sociology

Using input from a community advisory council, the investigators will assess the demand for goat meat among immigrants from the Middle East, Asia, Africa, and Latin America living in or near Sioux City. They will identify barriers and specify strategies that would increase the processing and marketing of goat meat; interview members of ethnic groups with similar diets; survey consumers at cultural festivals and immigration outreach clinics; and interview selected processors, grocers and restaurateurs, and goat meat producers experienced in marketing to immigrant communities.

# Business organization and coordination in niche hog marketing: Comparative analysis of two niche marketers, 2 years

#### J. Kliebenstein and B. Hueth, ISU economics

The two-phase project first considered the economic, business, and legal concerns for niche pork companies in these areas: timing, quality, process verification, business organization, and rate of return. The second phase is focused on incentive design or premium payments to increase producer participation. Alternative premium payment systems will be compared and evaluated for effectiveness in improving pork quality and showing returns for quality improvements.

#### NEW Community economic impact assessment for a multi-county local food system in northeast lowa, 2 years K. Enshayan, Center for Energy and Environmental Education, University of Northern Iowa

This project seeks to document the multiple economic impacts of a cluster of food and farm businesses in Black Hawk and surrounding counties. Included are direct-marketing farms, local vendors/suppliers of these farms and grocery stores and institutions that buy locally grown products.

#### NEW Developing an integrated research and outreach program for niche pork production, 1 year G. Huber. Practical Farmers of Iowa. Ames

The goals are to build upon the work of the Pork Niche Market Working Group (PNMWG) to increase interaction among niche pork farmers, researchers and technical assistance providers on production issues facing farmers who raise hogs for niche pork markets. These collaborations and the resulting projects will increase the abilities of niche pork farmers and farmer-owned niche pork companies to raise hogs needed for filling these markets; and increase the financial success and long-term viability of these farmers and companies.

## NEW Development of a regional wine culture in lowa, 2 years

#### W. Johnson, Limestone Bluffs RC&D, Maquoketa

This project will research and create a geographicallybased identity for grape and wine production in eastern lowa. The investigator will work with grape growers and wineries in eastern lowa to create the first American Viticultural Area (AVA) in the state and will document the economic impacts of wine tourism that would come with this designation. The project also will establish a wine trail to market the unique characteristics of the region.

## NEW Development of resources for organic food processors in the state of lowa, 1 year

#### S. Beattie, ISU food science and human nutrition

While there are many resources available for sustainable and organic agricultural producers, resources are lacking for those who wish to process these materials according to certified organic and other processing-specific regulations. This project will develop web-based resources for food processors who are interested in processing organically grown foods into finished products and also will fund a workshop for organic food processors in lowa and surrounding states.

# NEW Economic viability of local food marketing for restaurant operations and growers/producers in lowa, 2 years A. Sharma, ISU Hotel, Restaurant and Institution Management Program

What are the economic costs, benefits and non-economic factors that influence restaurants to buy and producers to sell locally grown/produced foods? The investigator will look at whether use of locally purchased food can be a competitive advantage for restaurants through increased market share and use of variable pricing strategies, identify economic implications for local growers/producers who wish to establish sustainable partnerships with local foodservice operations, and inform lowa restaurateurs about the economic viability of local food purchasing.

#### Grinnell area local food system initiative, 3 years (ending 2006)

# J. Andelson, Center for Prairie Studies, Grinnell College The Grinnell Area Local Food Alliance (GALFA) seeks to expand the local food system by increasing market access in and around Grinnell. A directory was published with information on Grinnell-area food producers who market locally. Several area restaurants have increased their purchases of locally grown food. The Leopold Center is supporting the segment of GALFA's effort that deals with

institutional buyers (hospitals, nursing homes, restaurants,

grocery stores, and schools) that provide food to customers

#### NEW Growing Your Small Market Farm Business planning program, 2 years

or clients.

#### S. Shafer and P. Brown-Huber, Iowa Small Business Development Center (ISU SBDC), Urbandale

The successful Grow Your Small Market Farm Business planning program helps midsize and small specialty niche farmers build their value-added business through writing a business plan, providing a year of one-on-one support, developing marketing materials, and training on Quick Books Pro. The grant will be used to recruit new entrepreneurs, expand the classroom offerings from 11 to 15 weeks, bring in a design expert for one day, and develop a newsletter for current and former participants.

## Leveraging student expertise to solve food production marketing problems, 2 years

#### K. Palan and J. Wong, ISU marketing

Teams of ISU business and agriculture students work with agricultural producers to develop marketing strategies and

plans to support their unique food and fiber businesses. Among them were an apple orchard, wineries, and a fruit and vegetable cooperative.

## Life in Iowa Homecoming Institute, 3 years (ending 2006) T. Ligouri and N. Bevin, ISU Extension

Life in Iowa is an ISU undergraduate academic program that integrates classroom and experiential learning. After preparation on campus, students are placed in Iowa communities for ten weeks during the summer for paid internships and civic engagement projects. The Leopold Center-sponsored interns work with community-based organizations that focus on sustainable agriculture, food systems, and the environment.

#### NEW Market Maker for Iowa, 1 year C. Tordsen, ISU Extension Value-Added Agriculture Program

The proposed product is a web-based marketing tool for lowa producers based upon the Market Maker program developed by the University of Illinois Extension. Using the web site, producers of value-added agricultural products will be able to find processors or markets in Iowa and Illinois. The site also can be used by processors or marketers to find producers of value-added agricultural products, or by producers, individuals, cooperatives, groups, or networks to form even broader networks.

# NEW Organic, natural and grass-fed beef: Profitability and constraints to production in the midwestern United States, 1 year M. Smith, ISU Extension Value-Added Agriculture Program and J. Lawrence, Iowa Beef Center, ISU

This project will determine the average costs of production to achieve current market grade standards for organic, natural and grass-fed beef, and the costs of transitioning to these production systems. Investigators will develop a user-friendly computer spreadsheet tool that farmers can use to quickly evaluate the cost and return potential for these niche market products. They also plan to survey local direct marketers and current marketing companies and cooperatives across the United States to determine the sales growth for their projects in the next 10 years.

# NEW Pilot project to identify and measure the relevant costs of production for sustainable agricultural products, 2 years S. Ravenscroft and M. Doran, ISU accounting

How can sustainable agricultural producers better identify and measure their relevant costs of production? The investigators will work with producers identified in two related Leopold Center marketing projects and with other producers developing unique food and fiber enterprises. They will analyze current costs of production and work with the producers to create cost models that will help them make more informed decisions about production and pricing.

#### NEW A proposal to use the conjoint market analysis tool to examine the factors that influence consumer attitudes toward beef products, 1 year B. Mennecke, A. Hendrickson and A. Townsend, ISU management information systems; D. Hayes, ISU finance and S. Lonergan, ISU animal science

This study will examine the consumer decision-making process related to beef. Specifically, it will look at how much each attribute (organic, pasture-raised, and others) is valued by consumers relative to other attributes such as appearance and taste. The results could offer useful information that will help producers understand what attributes consumers see as most valuable.

#### NEW The role of collaborative Community Supported Agriculture: A community, state and regional study, 1 year C. Flora and C. Bregendahl, North Central Regional Center for Rural Development

What role is played by for-profit, multi-producer Community Supported Agriculture (CSA) enterprises in strengthening local and regional food systems? Specifically, the study will determine whether collaborative CSAs in lowa and the North Central United States act as business incubators for single family-owned CSAs. The study also will examine how CSA business decisions and actions inform local agricultural entrepreneurs.

# NEW Reputational and environmental positioning as sources of competitive advantage for sustainable agricultural producers: Retailer-level effects, 1 year M. J. Barone and T. DeCarlo, ISU marketing

In commoditized markets, the most efficient companies often are the ultimate winners, prompting many firms to employ strategies that favor bigger producers (e.g., emphasizing lower costs and higher volumes). However, an alternative approach for differentiating products involves reputational and environmental positioning strategies. This project will look at the effects of producer size, environmental positioning, and social positioning on restaurants and grocery retailers, which play a fundamental role in the assortment of food products to which consumers are exposed.

# NEW Small and midsize lowa farmer training program: Marketing entrepreneurship and business planning skills, 1 year R. Padavich, Strategic Marketing Services and Management and Professional Development Center, University of Northern Iowa

The project will generate a highly customized training program targeted to small and midsize farmers as well as off-farm agriculture-related entrepreneurs in northeast lowa. Included will be business principles essential to identifying, starting and operating an agriculture-based business enterprise.

#### NEW Southwest Iowa Entrepreneurial Center: An achievable product-to-market business model for small/niche ag producers, 1 year L. Adams, ISU Extension, Corning

The goal is to unite small agricultural producers who produce value-added food products with people in the foodservice sector to consider niche marketing opportunities, specifically for home-meal replacement businesses. Menus will be developed around locally raised, seasonal foods. It is hoped that these efforts will strengthen the regional food system and lay groundwork for a network of producers to supply locally grown food products to small and medium-sized area institutions.

#### NEW Southwest lowa institutional foods survey and producer training program, 2 years S. Adams, ISU Extension, Malvern

This project will determine the potential for locally grown products in southwest lowa by surveying institutional food providers in a ten-county area. A second phase of the project will establish a network of existing organic or natural producers to create a delivery system for products, and to recruit new growers.

#### Supporting direct meat marketing in Iowa, 1 year (ending late 2005) R. Karp, Practical Farmers of Iowa, Ames

The possibilities for marketing sustainable meat products via cooperative buying clubs, CSAs, and a local produce company were studied. Subsequent workshops and marketing materials will help farmers develop their own direct meat marketing entreprises.

#### NEW Sustainable agriculture marketing, entrepreneurship and business planning skills, 2 years J. Starcevich, Indian Hills Community College, Centerville

Project activities include developing and implementing a curriculum on sustainable land management; developing plots for instructional labs on campus and on the property of participating landowners; organizing a regional consortium of growers, processors, and retailers; helping Area 15 vocational agriculture faculty integrate sustainable agriculture into the high school curriculum; and hosting a seminar series to raise awareness about local foods and regional marketing efforts. These efforts will complete the remaining curriculum for a new Land-Based Business/Entrepreneurship program at Indian Hills Community College.

## NEW Taste of place: Place-based foods in Iowa, 1 year R. H. Saltzman, Iowa Arts Council, Iowa Department of Cultural Affairs

lowa has a variety of place-based foods that connect the ecological production capacity of the region with the culture and traditions of its inhabitants. Five to 10 place-based lowa foods will be identified that meet certain cultural, geographic and ecological criteria: ingredients must be or have been grown and/or processed in lowa; the food must have some historical, ethnic, ecological or geographic heritage; and the food must have some kind of "story" related to it, which would make its lowa connection clear. The unique "stories" from each of the state's major ecological regions may play a role in marketing those foods locally, regionally, and nationally.

#### NEW Using contracts to expand produce market opportunities, 2 years J. Ellis, ISU Hotel, Restaurant and Institution Management Program

Focus groups will be convened to conduct a needs assessment that explores how contracts or marketing agreements can help producers manage the risk of increasing production while assuring foodservice operators of adequate supplies of high-quality fresh produce. One of the project goals is to develop a producer tool to inform decisions on developing production contracts with food service and retail food establishments.

# Web-based interactive decision model for determining economic feasibility of growing grapes and establishing a small winery for wine and grape juice, 2 years (ending 2005) M. Holz-Clause, ISU Agricultural Marketing Resource Center and G. Nonnecke, ISU horticulture

Entrepreneurs who are considering growing grapes and producing grape juice or wine will be able to use this interactive web site to gauge their best path to a successful business. The project also will produce three video vignettes offering basic information about operating a winery, marketing options, and agritourism. Also featured are financial templates for developing vineyards and wineries.



#### **Policy Initiative**

## Defining farm types: Policy research considerations, 1 year ISU Beginning Farmer Center staff

The common way for the government to classify U.S. farms is by gross annual sales. This project looks at other ways to categorize farms such as acreage, harvested cropland, or animal units. A simulation model will be created to gauge the impacts of a given policy on various sizes and types of farm operations.

#### Determination of the impact of USDA's National Organic Program on organic farms in Iowa, 1 year (ending 2005) K. Delate, ISU horticulture and agronomy

The U.S. Department of Agriculture imposed new organic standards on farmers starting in October 2002. Nearly 400 lowa organic growers will be contacted to determine the effects these standards are having on their operations.

## Early rounds: Farmers evaluate implementation of the Conservation Security Program (CSP), 2 years R. Karp, Practical Farmers of Iowa, Ames

Farmer knowledge and experience are being used to develop a set of recommendations and action steps to achieve effective CSP implementation. These recommendations will include identifying gaps and weaknesses in CSP procedures and providing ways to address these shortfalls. Encouraging a strong group of farmers committed to the program will help increase understanding and participation in CSP.

## Forming agricultural bargaining units for a sustainable and equitable agriculture, 1 year (ending late 2005) R. Ginder, ISU economics and D. Jarboe,

R. Ginder, 150 economics and D. Jarboe,
ISU Center for Crops Utilization Research

The Organic Farmers Association for Relationship Marketing (OFARM) is a cooperative marketing and bargaining association in the upper Midwest. This case study will examine how the OFARM organizational structure could be used by other farmer groups in Iowa, Minnesota, and Wisconsin.

# Improving the impact and benefits of USDA research and grant programs to enhance midsize farm profitability and rural community success, 2 years

J. DeWitt, ISU entomology

Research and analysis is being conducted to identify options and strategies to target more of current federal funding and improve the results of USDA efforts for beginning and midsize farmers. Four key federal agricultural research, marketing, and business/agricultural enterprise development programs were considered.

## Leveraging linkages to the Conservation Security Program, 1 year

#### M. Ackelson, Iowa Natural Heritage Foundation

A team of agency and nonprofit leaders will be assembled to activate watershed organizations and Soil and Water Conservation Districts for work with CSP local watershed enrollees. Watershed leaders should become active in recommending CSP practices and enhancement payments, and in outreach to farmers.

## A survival strategy for small and medium-sized farms, 1 year (ending late 2005) R. Ginder, ISU economics

Some smaller farms in the Midwest have used cooperative agreements to remain competitive in a difficult marketing environment. These farms will be included in a database and the investigator will evaluate the effectiveness of eight of these groups in enhancing the economic standing of their members.

# Taking the next step: Building a platform for performance-based stewardship payments, 2 years C. Flora, North Central Regional Center for Rural Development, Ames

How useful are conservation incentives in making significant environmental improvements? This portion of a larger study will unite predictions from a simulation model and an economic analysis in a southeast Minnesota sub-watershed to determine if and how the real cost of land change is supported by stewardship payments. Iowa's Rathbun Lake Watershed Alliance will be involved in making policy recommendations in this area.



# Old competitive grants program in Final Stages

he Leopold Center provided no-cost extensions to three projects that were part of the earlier broad-based competitive research program. They all should be completed by the end of FY2006.

Water Quality

Economically sustainable riparian buffer to promote bank stability and reduce gully erosion and phosphorus runoff in the Loess Hills 3 years (extension granted to 2006) M. Kelly, (formerly) ISU natural resource ecology and management, PI responsibility assumed by J. Colletti, ISU forestry

Investigators propose to evaluate the effectiveness of a tree-based riparian buffer in the Deep Loess Hills for suitability in managing landscape issues such as erosion and phosphorus movement. Field samples have been collected that provide information on the standing crop of above-ground biomass and plant phosphorus uptake. Root estimates have been less successful and additional sampling to a depth of 240 cm was planned for the 2004 growing season.

Impacts of managed grazing on stream ecology and water quality, 3 years

J. Russell, ISU animal science (ending 2005)

The project investigated the amounts of sediment and phosphorus in the runoff from pasturelands managed by different systems. Demonstrations include upland grazing, riparian grazing, runoff plots, streambank erosion, whole-farm phosphorus flow estimates, and rainfall simulation. ISU researchers from three departments are collaborating with the lowa Cattleman's Association and the National Soil Tilth Laboratory on this project.

Evaluating pork production systems for niche markets, 3 years (extension granted to 2006)

Jivestock Management

D. Stender, Cherokee County ISU Extension, Cherokee

The investigator is working with several northwest lowa producers to obtain on-farm data for comparing hoop and confinement operations. A database is being constructed to compile information on seasonal environment, nutrition, genetics, and operator management differences in sustainable systems.

# Special Projects

ccasionally directed research or demonstration work arises outside of the Request for Proposal (RFP) cycle or may not fit squarely within an initiative focus area. In those cases, funds may be provided on a special project basis.

#### **Marketing and Food Systems Initiative**

## Analysis of cooked meat weights and protein content of organic and conventional poultry, 1 year

J. Sebranek. ISU Meat Laboratory

In a preliminary study, organic and conventional chickens were compared and the cooked meat and protein content were analyzed.

# Case studies of the development and efficacy of pasture-raised meat marketing messages: lowa lamb case study, 1 year

J. Ennis, Cooperative Development Services, St. Paul. Minnesota

This case study considers how an lowa lamb producer can develop strategic marketing messages for pasture-raised meats. It is part of a regional project with five partners and includes six case studies of beef, dairy, and poultry producers in lowa, Minnesota, and Wisconsin.

#### Consumer Internet food survey, 1 year

T. DeCarlo, ISU marketing

Using a web site survey, consumer perspectives on place-based foods, family farms, and profit distribution across the value chain were measured.

## Economic analysis of current and potential Muscatine Melon market, 1 year

C. Chase, ISU Extension, Waterloo

In collaboration with Sue Futrell, a survey and grower meeting were conducted to determine the level of interest in the market for this traditional lowa produce crop.

#### Evaluation assistance for Marketing Initiative projects, 1 year M. Feldmann and M. Kemis, ISU Research Institute for Studies in Education (RISE)

RISE is providing a comprehensive evaluation of the Leopold Center Marketing and Food Systems Initiative activities.

## Place-based foods and agritourism potential in northeast lowa, 1 year

C. Streed – Silos and Smokestacks, and the Sustainable Tourism and Environment Program, University of Northern Iowa

The project will survey consumer interest in the link between place-based foods and agritourism in northeast lowa (the Silos and Smokestacks heritage region).

#### Produce Market Potential Calculator, 1 year R. Boekenstedt and M. Reginold, ISU Center for Transportation Research and Education (CTRE)

The team developed a web-based version of the produce market spreadsheet that was originally developed by Leopold grant M09-2004.

## Sustainable and Entrepreneurial Agriculture Program, Challenge Grant, 1.5 years,

B. Burrows and L. Barnes,

#### **Marshalltown Community College**

This funding helped establish the Sustainable and Entrepreneurial Agriculture program at a central lowa community college.

#### **Ecology Initiative**

### Effects of biomass harvest on soil erosion and carbon sequestration, 1 year

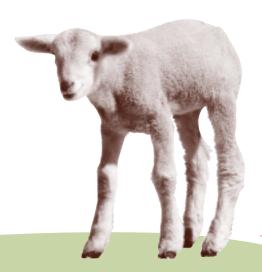
## T. Richard, ISU agricultural and biosystems engineering

The Water Erosion Prediction Project (WEPP) simulation models were employed to study the effects of biomass harvest on erosion and soil carbon under typical lowa conditions. Several cropping systems were considered. Erosion at different crop residue removal rates was compared on different soils and on different slopes, and showed that soil type had a smaller effect on erosion than did slope or biomass removal rate.

# Implementing a leafy spurge (*Euphoriba esula L.* or *E. x pseudovirgata*) biological control agent release and monitoring program in Iowa, 3 years R. Pope, B. Hartzler, and J. DeWitt, ISU entomology

Leafy spurge is a perennial that has been a problem in western U.S. rangelands because of its stout rhizomes, unpalatability to grazing animals, and quick regrowth.

Students at Dordt College will be trained to identify leafy spurge and spurge flea beetles that feed on the plants to document significant infestations in northwest lowa. Investigators hope to establish beetles in selected leafy spurge infestations during the first year and monitor their effectiveness at controlling leafy spurge during subsequent years.



## Other Special Projects

## Combine clean-out for identity-preserved grains, 2 years M. Hanna, ISU agricultural and biosystems engineering (ending 2005)

Improved field production techniques potentially can benefit value-added production. Replicated clean-outs of several different combines used in both corn and soybean harvests measure the amount of crop remaining in several different areas of the combine, and the purity level achieved in the next grain harvested by the combine. Estimates of potential grain remaining in various parts of the combine and estimates of the labor required for cleanout will allow farmers to better evaluate costs for various purity requirements.

#### Pesticide use on conventional and GM crops: A three-crop NASS analysis, 1 year C. Benbrook, Benbrook

#### **Consulting Services, Sandpoint, ID**

The Leopold Center and several partners funded an analysis to develop tables and offer observations regarding pesticide and herbicide usage for conventional and GM crops, based on National Agricultural Statistics Service (NASS) crop reports. The analysis focused on insecticide use patterns for corn and cotton, and herbicide use patterns for corn, cotton, and soybean.

AGRICULTURE WAS THE FIRST

MANUFACTURING INDUSTRY

IN AMERICA AND

represents the best of all of us.

–ZACK WAMP

#### Leopold Center for Sustainable Agriculture

Iowa State University 209 Curtiss Hall Ames, Iowa 50011-1050 (515) 294-3711

fax: (515) 294-9696

e-mail: leocenter@iastate.edu web site: www.leopold.iastate.edu

