

Letter

Center honors current commitments

Leopold Center braces for budget cuts

For the first time since the Groundwater Protection Act was passed in 1987, the Leopold Center is preparing for a significant cut in program funding.

The agricultural and natural resources budget bill signed into law on May 25 includes a \$250,000 reduction for the Leopold Center from funds generated by fees charged on the sale of nitrogen fertilizers and pest control chemicals. The Center also will experience a further reduction in a line item that is part of the total Iowa State University appropriation. That amount will be determined when the final ISU budget is ready in July.

The reductions represent a significant decrease in the Leopold Center's \$1.5 million research budget, and have raised concerns about their impact on current programs.

"We will honor our commitment to projects that will begin July 1 or have been renewed for another year," said Leopold Center director Fred Kirschenmann. "But more than half of these projects are for more than one year and, to accommodate the budget cuts, we can give no guarantees beyond the upcoming year. We have already begun to evaluate existing programs and how they relate to sustainable

agriculture at the farm level."

The Leopold Center Advisory Board gave preliminary funding approval in March to fiscal year 2002 competitive grants. In the past, final grant amounts were announced in mid-June at the same time that a request for proposals (RFP) for the upcoming fiscal year was issued. As a first step to adjust to the budget cuts, the Center's fiscal year 2003 RFP is on hold, along with the Center's conference and workshop program that began in 1994.

"We will give serious consideration

BUDGET

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No clear choices surface in U.S. farm bill debate

By Mike Duffy
Associate director

The 1996 Federal Agriculture Improvement and Reform (FAIR) Act, the current U.S. farm legislation, is set to expire next year and the debate over the new farm bill has begun in earnest. Many options are available, but at this time no one plan has surfaced as a clear favorite for a majority of the parties involved.

In March, Leopold Center director Fred Kirschenmann and I testified before the Senate agricultural subcommittee that is considering the new legislation. The

News analysis

director's testimony focused on research issues for the farm bill, while I discussed the current situation in Iowa and presented some suggestions for the new bill. The testimony is posted at the

Leopold Center web site, or can be obtained by contacting the Center.

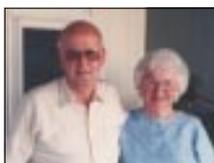
Farmers depend on payments

The outcome of the debate will significantly influence all of agriculture. During the 1990s, almost one-fourth (23 percent) of the net farm income for U.S. agriculture came from direct government payments. Since the passage of

FARM BILL

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Children of an Iowa farm couple set up new award for sustainable agriculture 5



New chapters are being written



every day in the story of local food.

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Interns interested in family farms

Two Iowa State University students who didn't grow up on a farm would like to make sure that others do have that opportunity.

Sarah Low and Annette Mathieu, both seniors in public service and administration in agriculture, are summer interns at the Leopold Center this summer. Mathieu, a graduate of Dowling High School in Des Moines, is working with education coordinator Rich Pirog to summarize conference and workshop evaluations and help with several local food system projects. Low, who grew up in Maysville, is assisting with the Center's visioning activities and helping with Center outreach.

Low is not new to agriculture. Many of her classmates at North Scott High School in east central Iowa lived

on farms. She learned about the Leopold Center's efforts to help family farmers last year while working in ISU's rural sociology department. This summer she splits her time between the Center and the Iowa Agricultural Development Authority.

"I hope to learn more about sustainable agriculture and the sustainability of rural life in Iowa as we now know it," Low said. "When I graduate from Iowa State next May, I hope to attend graduate school in public administration or public policy, so this internship will provide me with valuable experience."

Mathieu's focus is on marketing. She hopes to find work in cooperative extension after graduation. She returned to ISU in 1998, having moved back to Iowa in 1994 after living several years in California.

"I had no experience in agriculture but was looking for a career that would



Sarah Low



Annette Mathieu

be promising in a state like Iowa," Mathieu said. "Our agricultural system is changing and I want to work for the preservation of the family farm, rural communities and our precious natural resources. Agricultural issues, such as chemical use, pollution, food safety and farm size, will become more significant in the near future."

This is the ninth year for the Leopold Center's summer internship program. Interns meet producers at field days and work with educators from the Center's partner organizations on various projects.

New member joins board

The first director of Iowa State University's Plant Sciences Institute also is the newest member of the Leopold Center



Stephen Howell Advisory Board. Stephen Howell, who came to ISU in January from Ithaca, New York, succeeds Colin Scanes as one of two ISU representatives on the board. Scanes had served since 1997.

Howell brings to the board an international research reputation in the genetics of plant pathology and physiology. Most recently he was vice president for research at the Boyce Thompson Institute for Plant Research, a private, nonprofit corporation affiliated with Cornell University. At the ISU Plant Sciences Institute, he oversees research at nine centers on campus including the Center for Plant Genomics and Center for Designer Crops. A native of Davenport, Howell grew up in Ames and received a biology degree from Grinnell College. He holds a doctoral degree from Johns Hopkins University and was a member of the biology faculty at the University of California-San Diego for nearly 20 years. He moved to Ames with his wife, Elizabeth. They have two grown children.



LEOPOLD CENTER

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The Leopold Center for Sustainable Agriculture seeks to identify and reduce adverse socioeconomic and environmental impacts of farming practices, develop profitable farming systems that conserve natural resources, and create educational programs with the ISU Extension Service. It was founded by the 1987 Iowa Groundwater Protection Act.

The Leopold Letter is available free from the Leopold Center at 209 Curtiss Hall, Iowa State University, Ames, Iowa 50011-1050; (515) 294-3711.

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Balancing ecology and technology

We live in a culture that seems to assume that all of our problems can and must be solved with technology. It is easy to see how we came to this conclusion. Ever since the beginning of the industrial revolution, we have created one technological marvel after another. Technologies have increased our productivity, reshaped our world, and improved our quality of life.

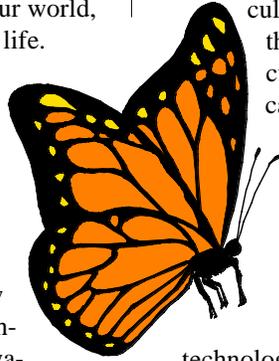
One thing we seem to have forgotten along the way is that there is a cost to every technology. We haven't always done a good job of assessing the costs, particularly those with long-term consequences, and now some of those costs are catching up with us. Our global water systems contain 50 dead zones. The planet's temperatures are on the rise. There is a hole in the earth's ozone layer. Evidence linking the byproducts of our technologies with health-related problems is increasingly disturbing. The loss of biodiversity from our technologies not only threatens the stability of the planet, but—according to separate studies issued by the World Bank and the Council for Agricultural Science and Technology—also imperils further agricultural productivity.

Farmers face another disturbing circumstance. Even though agricultural technologies have enabled producers to dramatically increase their productivity and solve many of their immediate production problems, technology does not appear to have helped them improve their net income. According to a recent study by Mike Duffy, associate director at the Leopold Center, Iowa farmers' gross income and total expenses both increased thirteen-fold from 1950 to 1998—while their net income remained flat! This seems to indicate that all of the improved technologies ultimately didn't help farmers' bottom line.

At the same time, evidence

surfacing in many parts of the world suggests that we should consider an alternative approach. An ecological approach would try to achieve production goals by using nature's own ecosystem services instead of relying solely on technology.

Our technologically-oriented culture remains skeptical of this new approach to agriculture. News media have carried articles suggesting that without intensive



An ecological approach would try to achieve production goals by using nature's own ecosystem services instead of relying solely on technology.

technological management the world's people would suffer extensive malnutrition and/or we would have to plow up all of our wilderness areas and fragile lands to feed a growing population. It is ironic that such propositions occasionally appear even in respected scientific journals, although dire predictions are based largely on conjecture rather than field-tested data. At the same time, extensive on-farm research now suggests that ecological approaches usually are both more productive and more profitable.

A newly published study by Jules Pretty and Rachel Hine at the University of Essex (UK) looked at 208 cases from 52 countries to assess the performance of sustainable agriculture. They define sustainable agriculture as an agriculture that "seeks to make the best use of nature's goods and services as functional inputs"—in other words, farms that use an ecological approach. They found that in these projects—which involve 8.98 million farmers who have adopted sustainable agriculture practices on 28.82 million hectares—yield increases for rain-fed crops went up 50 to 100 percent, and yields increased 5 to 10 percent on irrigated crops.

A study in the April 19 issue of *Nature* magazine, conducted by John Reganold and his colleagues at Washington State University, compared the economic, energy and environmental performances of organic, integrated and conventional farms from 1994 to 1999. The study demonstrates that organic apple orchards (one type of ecological farming) in Washington state produced "sweeter and less tart apples, higher profitability and greater energy efficiency" than the

conventional apple farms. Additionally, their data show that "the organic system ranked first in environmental and economic sustainability, the integrated system ranked second and the conventional system last." Soil quality ratings for the organic and integrated farms also were "significantly higher than those for the conventional system."

The October 1999 issue of the *Ecologist* magazine reported that Japanese farmer Takao Furuno developed a new system on his two-hectare farm with similar results. Rice paddies occupy 1.4 hectares; the rest is devoted to organic vegetable production. A few years ago, Mr. Furuno decided to incorporate ducks into his rice paddies. He discovered that the ducks ate the insects and snails that normally attack the rice. They ate the weed seeds and weed seedlings, so he no longer needs to weed his rice paddies. The activity of the ducks also appears to oxygenate the water "encouraging the roots of the rice plants to grow." Other species (fish, duckweed, etc.) in his paddies provide fertilizer.

Farmers who have adopted similar methods in various parts of the

DIRECTOR

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Check out research in new Center Progress Report

By Mary Adams, Editor

The Leopold Center is now distributing copies of its 2001 *Center Progress Report*. The 80-page volume features summaries of research efforts supported by the Center's competitive research and education grants programs. The tenth in an annual series of reports, it describes 24 projects that ended in 2000.

Highlights of this year's completed efforts involved research and education on forages, legumes, oats and alfalfa. Other researchers explored biological controls for apples, strawberries, and corn borers; botanicals to feed pigs in lieu

of growth promotants; and swine manure management decisions. Two special projects sought to help farmers stressed by economic uncertainty in rural communities. Restoration of farmland woods was one of three ecology projects completed.

For those with questions about the projects, the principal investigator's name, phone number, e-mail, and regular addresses appear at the end of each summary. The Center also can provide copies of the entire final project report.

In the course of preparing the project summaries, director Fred Kirschenmann asked researchers to summarize their work. Here are a few of their responses.

What was the central question in your project? What did you find out?

Botanicals as part of an integrated value-added pork production system

Some consumers are interested in purchasing livestock products from animals not fed antibiotics. These studies evaluated four botanicals with various claims to enhance human health or immunity as potential replacements for antibiotics. Based on these trials, Echinacea (purple coneflower) at various levels may offer an alternative to the feed additive, Mecadox. – *Palmer Holden, ISU Animal Science.*

Manipulation of predatory insects for enhanced biological control of pests

The central questions were to identify the chemicals used by predatory lacewings and lady beetles to locate insect prey and to use these compounds to attract these predators to specific locations. The attractants identified in this project are the basis for a new commercially available lure for these predatory insects. Growers now have a method to attract predators to their gardens or fields. – *John Obrycki and Tom Baker, ISU Entomology*

Community regeneration through strengthening the local food economy

The central goal was to work with institutional food buyers to explore and implement ways that would help them purchase a greater portion of their food supply from local/regional farmers and processors. What we found is that it is possible and practical to expand local markets for local agricultural products through institutional markets. More than \$110,000 per year was invested in local farms and processors by the three institutions we worked with. And that is only in one metro area, with many other institutional buyers. The farmers who participated in this project reported small to significant increases in their gross income. – *Kamyar Enshyan, University of Northern Iowa*

A simple method to increase alfalfa yield in the establishment year

Our question was: Can we increase the yield of alfalfa in the year of planting and not adversely affect subsequent production by adding some proportion of non-dormant (non-winter hardy) alfalfa to the seeding mix? We do not recommend this practice. Although non-dormant alfalfa slightly boosted first-year yields by allowing a late fall harvest, even 10 percent of non-dormant seed depressed yield in the second year. – *Charlie Brummer, ISU Agronomy*

Biologically intensive pest management and Iowa apple growers

Is biologically intensive management of apple scab, codling moth, and sooty blotch/flyspeck complex a viable option for Iowa apple growers? Several scab-resistant apple varieties showed good yields and scored well in consumer preference tests. Two new management tactics—a weather-based disease-warning system and post-harvest dips in chlorine solutions—can significantly reduce reliance on fungicides for control of sooty blotch and flyspeck. Due to low populations of codling moth during our tests, the jury is still out on the suitability of biologically intensive methods to manage this pest in Iowa. – *Mark Gleason, ISU Plant Pathology*

Sustainable approach puts nature's services to work

DIRECTOR

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world report a 20 to 50 percent increase in rice yields the first year. Furuno's small farm now annually produces "seven tonnes of rice, 300 ducks, 4,000 ducklings and enough vegetables to supply 100 people." From the perspective of the bottom line, it is worth noting that Furuno not only has dramatically increased his yield, but once he is finished with the inputs (namely the ducks) they, too, become a source

of income. Isn't this a model we should consider for "feeding the world?"

These studies and others that tell similar stories suggest that we should be putting at least 25 to 30 percent of our research dollars into exploring such ecological approaches to solving production problems. Investing virtually all of our dollars in technological solutions means that farmers not only will continue to see their potential

profits eaten up by input costs, but also will be forced onto a treadmill that eventually puts them out of business.

Nature always finds a way to adapt to the technologies we create, quickly developing resistance to all our efforts to eradicate pests. And on top of that, we continue to degrade our environment with technologies that we always initially assumed were "safe."



New sustainable agriculture award honors Iowa farm couple

A new award will honor the beliefs, innovations and stewardship of a rural Iowa couple who farmed for 40 years near Sioux City in Woodbury County. The Spencer Award for Sustainable Agriculture is part of a \$20,000 gift to the Iowa State University Foundation in memory of Norman A. and Margaretha Geiger Spencer. It was given by their children, Robert Spencer of LaCrosse, Wisconsin, and Elaine Spencer of Seattle.

The Spencer family has asked the Leopold Center to present the award periodically to someone who—like their parents—is committed to the family farm in Iowa. The award also will recognize significant contributions to the advancement of ecological and economic practices that make agriculture sustainable and the family farm secure for the future.

"It is a special honor for the Center to administer the Spencer Award," said Leopold Center director Fred Kirschenmann. "I was struck by Robert and Elaine's tribute to their father that described how he managed his land. As soon as I read that, I knew he represented the kind of farming that Aldo Leopold would have endorsed. We are very proud to add this program to our work."

The amount of the award has not been determined. A call for nominations will be announced at a later date.

The Spencer family has close ISU ties. Norman was a 1940 graduate in agricultural engineering and Margaretha, a 1944 graduate in home

economics. Their son, Robert, earned his doctor of veterinary medicine in 1971 and is a veterinarian in La Crosse. Elaine Spencer, who practices law in Seattle, received a degree in food and nutrition from ISU in 1971, and a degree from Yale Law School in 1976.

The Leopold Center will administer a new award that honors Norman and Margaretha Geiger Spencer.



Photos courtesy the Spencer family.

The Legacy of Norman and Margaretha Geiger Spencer*

*Excerpted from a tribute written by their children

Farming was both vocation and avocation for Norman Spencer. He approached it as a business, as a science, and as an art.

Before the words 'organic farming' had been coined, he developed ways to use nature's own defense mechanisms instead of the pesticides, herbicides and antibiotics that other farmers increasingly depended upon. While other farmers often unsuccessfully attempted to fend off epidemics in their turkeys with heavy and continuous doses of antibiotics, he prevented epidemics by moving his turkeys to clean ground.

As his next-to-last act of stewardship, the winter before he sold the farm, he had a bulldozer rebuild the terraces that protected the hills from erosion. That was an investment usually amortized over 20 years, from which he would see no return. It was one bit of extra security, however, that the next steward would at least meet his minimum standards.

Evaluation begins

BUDGET (continued from page 1)

in the next six months for all projects and programs in which the Center is involved, and how they relate to new directions for the Leopold Center," Kirschenmann said. "We want to focus on programs that will most help farmers."

Despite the budget shortfalls, Kirschenmann said that he was pleased with the support given to the Leopold Center during the legislative process. Governor Tom Vilsack also used a line item veto to reduce the Center's funding cuts by \$100,000 when he signed the agricultural and natural resources budget bill in May.

NEWS & NOTES

Leopold Center education coordinator **Rich Pirog** presented findings of a new food systems research paper at the Agriculture, Food and Human Values Conference in Minneapolis June 8-10. The paper, "Food, Fuel and Freeways: An Iowa perspective on how far food travels, fuel usage and greenhouse gas emissions," is now available from the Leopold Center and at the Center's web site. The paper was developed with the help of student interns Timothy Van Pelt and Ellen Cook, and University of Northern

Iowa adjunct assistant professor Kamyar Enshayan, who has completed a Leopold Center-funded institutional food buying project in Cedar Falls.

* * *

Leopold Center director **Fred Kirschenmann** talked about the future of agriculture at a forum sponsored by the Institute of Food and Agricultural Sciences (IFAS) at the University of Florida on June 27-28. His speech, Agriculture's Uncertain Future: Unfortunate Demise or Timely Opportunity," is available at the Leopold Center's web site. The forum is part of the Florida FIRST initiative.

A common ground to discuss genetics

The Century of the Gene

Evelyn Fox Keller

Harvard University Press 2000

192 pp., \$22.95

When Steven Spielberg filmed *Jurassic Park*, he hired paleontologist Jack Horner as his science advisor. Horner had spent much of his life trying to correct the popular image of dinosaurs as marauding predators. He reminded us that the 12,000-pound *Tyrannosaurus rex* could not run, see much beyond its nose or grasp prey between its front claws (its arms were too short). It did, however, have a keen sense of smell and probably sought rotting carcasses for food.

But when Spielberg created the ultimate movie moment in *Jurassic Park*—with the *T. rex* pursuing Ellie and Ian in their Jeep—good science gave way to theater.

'The most egregious problem'

Evelyn Fox Keller, professor of history and philosophy of science at Massachusetts Institute of Technology, uses this analogy to describe our current ideas about genetics. The popular image of the *T. rex* led Spielberg to “lapse into established stereotype,” thereby “extending the life of the mythical *T. rex*.” Today’s genetic scientists also are extending the popular image of the gene as the one thing that constitutes “the basis of all aspects of organismic life,” despite the fact that current science no longer supports such a view.

In fact, Keller says the central premise in *Jurassic Park*—that one could clone a dinosaur from its DNA—is the “most egregious problem” in how we perceive the science of genetics. This misperception reveals our continued homage to an early (and flawed) view of genes. Yet such absurd images persist, despite the fact that leading edge science makes such a proposition an “utterly fantastic premise.”

According to Keller, the term “genetics” was coined in 1906. The term “gene” was used in a biological context three years later, although no one could define it. By 1933, “gene” had become “the biological analogue of the molecules and atoms of physical science,” still without any scientific basis. Not until 1943 with the “identification of DNA as the carrier of biological specificity in bacteria” did we begin to answer the question, “What are genes made of?” It was Watson and Crick’s famous announcement in 1953 that “convinced biologists not only that genes are real molecules, but also that they are constituted of nothing more mysterious than deoxyribonucleic acid” (now known simply as DNA).

A new understanding of genetics

This image of genetics captured the imagination of scientists and non-scientists alike. The “one gene/one enzyme” hypothesis has transformed the way we see the world. Both scientists and the media almost daily besiege us with images of curing incurable diseases, creating fantastic new organisms and “feeding the world”—all by the simple manipulation of a few genes.

Keller points out that while the rhetoric continues to make fantastic claims, the science of genetics points in a different direction. Hieter and Boguski have described the new direction best with the term, *functional genomics*, defined as “the development and application of global (genome-wide or system-wide) experimental approaches to assess gene function by making use of the information and reagents provided by structural genomics.” In other words, the real benefit of genetics seems to be derived not from the manipulation of a few genes, but from our enhanced understanding of how nature works.

Keller describes this profound shift in thinking:

For almost fifty years, we lulled ourselves into believing that, in discovering the molecular basis of

genetic information, we had found the ‘secret of life;’ we were confident that if we could only decode the message in DNA’s sequence of nucleotides, we would understand the ‘program’ that makes an organism what it is.

But the new view of genetics has more to do with how we think about biological organization than with how we modify it. As we enter the 21st century, Keller says we are at a “rare and wonderful moment” when the greatest insight we might gain from the study of genetics is humility.

These insights provide fruitful common ground for creative dialog between geneticists and advocates of sustainable agriculture—groups that have had very different world views. Twentieth-century geneticists claim to have discovered “the secret of life” and a means to recreate a world that suits the needs of the human species. On the other hand, scholars of sustainable agriculture have sought to understand how natural systems work and how to fit human enterprises into that system.

Changing vs. understanding

As a result, there has been little room for interaction. Geneticists focused on *changing* “the critical elements of the biological blueprints at will” while sustainable agriculturists were intent on *understanding* the biological blueprint and (as Aldo Leopold would have put it) discovering how to effectively *be part of* that rich biotic community.

The new genetics, with its emphasis on better understanding how complex biological systems work, provides an enormous opportunity for enriching both the study of genomics and the study of ecology. The future of agriculture certainly would benefit from such a dialog, and Keller’s book is a good place to start. — Fred Kirschenmann

Without compromise, farm program reverts to 1949 law

FARM BILL

(continued from page 1)

the current farm bill, government payments have averaged 26 percent of the farm sector's cash income (based on 1996 through 2001 estimates).

These figures are for the entire United States. Data from individual states show an even greater reliance on government payments. In Iowa, for example, government payments have averaged 55 percent of the net farm income during the 1990s. Direct government payments to Iowa averaged \$905 million each year from 1990 to 1999.

Such heavy reliance on government subsidies indicates that the farm bill and its replacement have a significant impact on the financial health not just of farmers, but rural communities and states in general. Major agricultural interests and commodity groups have stated their positions, but are inconsistent in some cases. The compromises that will surely be necessary have not yet begun.

Possible alternatives

The first course would be to simply let the current legislation expire and not enact anything in its place. This is highly unlikely. The FAIR Act contains a provision stating that if no new farm bill is passed, the country would revert back to the 1949 permanent agricultural legislation. Under the 1949 bill, costs of programs would soar and the nature of programs would change considerably.

Another possibility is that Congress would repeal the 1949 legislation. This, too, is not probable. Such a dramatic change would require considerable coalition-building, not likely given the current makeup of the U.S. Senate.

Numerous other options and alternatives have been suggested and are being examined. A major feature of many alternatives is some type of counter-cyclical payment, under which farmers would receive higher payments when prices are low and lower payments when prices recover. Additional variations on this cyclical payment theme are being considered.

There also is strong support for an increase in conservation incentive payments, the so-called "green payments." Again, this option has many versions,

the predominant one being the proposed Conservation Security Act. This program would have three tiers of payments to farmers, with each tier characterized by an increasing level of farm practices that protect the environment and natural resources. Farmers would be allowed to choose any level of participation. Farmers who do not participate would not receive any payments.

Reinstating the farmer-owned grain reserve also has been discussed, as have different set-aside programs. Under one scheme, farmers would be given the option to set aside acres and receive payments based on the level of land set-aside they chose. This program would be voluntary, and there would be no payments if a farmer opts out of the program.

Some people favor enhancing current programs by adjusting crop and revenue insurance premiums and the level of coverage. Other groups also want to consider increasing trade enhancements and subsidizing alternative crops, especially crops used for production of energy.

FAIR Act questions remain

Many other possibilities exist, each with advantages and disadvantages. Regardless of what programs are passed, there is almost universal support for avoiding a return to a set-aside program. The 1996 FAIR Act, also known as "Freedom to Farm," gave farmers flexibility to plant any crop.

A concern about retaining the FAIR Act is cost. When first enacted, FAIR was billed as legislation that would be a transition to a free market farm policy in the United States. Farmers could plant what they wanted and the movement of the market would dictate which crops were produced. New insurance schemes were introduced and payments to farmers were set at a decreasing level until, at the end of the FAIR Act, payments would be reduced to nothing.

What has happened, however, has not been a gradual removal of the government from agricultural production. There are no set-asides or grain reserves, but the cost of funding the FAIR Act has soared with low commodity prices. Costs have increased at a considerably higher rate than anticipated.

Passing a farm bill to reduce the government's cost is a top priority for many people, but the sentiment still exists that the market should dictate plantings and will probably influence the outcome of the 2002 farm bill debate.

A minimum wage for farmers?

In my testimony before the Senate Agricultural Committee, I proposed a simple plan that would replace all current payment programs with a wage program. The idea is to protect the return to labor by supporting farmers, not by supporting commodities. This proposal would establish a wage rate for farming operations. Farmers would be paid based on the number of units (acres, litters, cows, or whatever measure selected) they produced at a standard amount of labor per unit, multiplied by the wage rate. Payments would be capped at full-time employment levels.

Space does not permit me to go into all the details of such a proposal but it would satisfy several complaints levied against the current legislation. This plan also would allow total "freedom to farm." Farmers could plant whatever they wanted, market the output however they wanted, and know exactly what level of support they would receive. There would be no set-aside programs, loan deficiency payments or any of the other currently used support mechanisms.

Under this proposal, farmers would receive a fair wage for their labor. Their financial return would depend on their management skills in making the right production decisions. Farmers would receive payments based only on the hours they worked and produced, and only up to full-time employment rates.

An important outcome

Farmers must pay close attention to the current farm bill debate because their future could literally depend on its outcome. Farmers must make themselves and their wishes known to the policymakers. Trade-offs are inevitable, and without knowing people's opinions, it will be hard to reach an acceptable compromise.

Michael Price discusses the extensive ecological knowledge required to build a birchbark canoe, or wiigwaasi-jiimaan. If constructed properly, a canoe would have almost no impact on the surrounding forest. The canoes were vital for fur trading and collecting wild rice on lakes and rivers.

Photo by Aaron Fairbanks



We are not just invisible, objective observers but actual and accountable participants in the complex web of life.

—Michael Price

A Native American teacher talks about biotechnology

By Laura Miller
Newsletter editor

Aldo Leopold's notion of a "land ethic" and being part of the "entire biotic community" may have seemed strange to U.S. scientists when he introduced them more than 50 years ago. But to Native Americans like Michael Price, Leopold's ideas represent a centuries-old way of life.

"We are not just invisible, objective observers but actual and accountable participants in the complex web of life," Price says. "The ideas of sacredness and spirituality directly affect our relationship to and interaction with nature and one another."

A college professor and member of Wikweimikong First Nations, Price was at Iowa State University in March to share how he uses his culture's spiritual approach to the natural world in his science classes. The result is an integrated science program at Leech Lake Tribal College near Cass Lake, Minnesota.

Role of traditions, ceremonies

Price incorporates several ceremonies and traditions that he learned from his elders into his classes for Anishinaabe students (otherwise known as Ojibwe or Chippewa). When collecting specimens for class, students honor the organism—insect or plant—in a special ceremony. After the experiment, they return items to the place where they were found. Strict cultural taboos prohibit students from handling dead organisms, so instead they use plastic dissection models for anatomical study.

Price said students learn as much from participating in the ceremonies as they do in gaining the technical knowledge.

"Ceremonies and traditions help us keep respect for life and remind us that what we do affects everything else," he said. "Our ancestors knew we had the power to manipulate and destroy the world around us, so they developed these traditions to keep our activities in check and monitor our behavior."

Generational knowledge

Price also said cultural practices passed from one generation to another also have helped Native American communities remain sustainable. Indigenous knowledge is steeped in information about local ecologies. For example, the Shoshone people knew the best time to plant corn on the riverbanks before moving to the high country to hunt. When a certain yellow flower blossomed, it was time to return for corn harvest.

"Scientists call it comparative growth rate analysis, but the Shoshone people understood because it was essential to their survival," he said. "Native American communities are some of the most sustainable on earth because they live in balance with their environment. They follow the seven-generation rule: How will what we do today impact seven generations from now?"

Such questions are important as scientists enter new fields of biotechnology and genetic engineering, he added.

"I'm not quick to say that all genetic engineering is unnecessary, but

we need to ask two questions: Why are we doing this? And what are we giving back to the plant?" he said. "If we're altering plants to help produce more food, is that food actually getting to the people who are hungry?"

Price is the institutional representative for his college on a \$3.7 million grant awarded by the Cooperative State Research, Education and Extension Service (CSREES) to Leech Lake Tribal College, ISU and seven other institutions in Minnesota, North Dakota, South Dakota and Wisconsin. The four-year project supports research and education activities to address the social, economic and ethical aspects of biotechnology.

Iowa State University units participating in the grant include the Bioethics Program, ISU Extension, the Department of Economics, the Department of Sociology, and the Office of Biotechnology. The Leopold Center has been invited to join in planning activities and was one of several groups to sponsor Price's visit to campus.

For further reading..

- *Tribal College Journal*, with other culture-based issues related to education, can be found at: www.tribalcollegejournal.org

- Biotechnology and ethics consortium web site is at: www.biotech.iastate.edu/publications/IFAFS

Participants offer perceptive insights on future directions

By **Laura Miller**
Newsletter editor

We heard great ideas and talked about what people value. We discussed some of agriculture's most perplexing problems. But most of all, we got a "reality check" from nearly 200 Iowans about three proposed initiatives for future activities at the Leopold Center.

The Leopold Center initiatives target the creation of new markets and policies that benefit midsize Iowa farms and seek ways for those producers to use more ecologically driven production technologies. We worked with partners in Sioux Center, Hiawatha, Mt. Pleasant, Decorah, Lewis and Greenfield to conduct "community

conversations" as part of the Center's visioning activities. The meetings included people with many opinions—rural and urban, producers and consumers, young and old, conventional and organic—about far-ranging topics from urban sprawl and food labeling to government support programs and green payments.

The consensus was that we're on track with the three initiatives of economic policy, marketing and ecology. People also told us not to abandon family farmers, and that they were open to new ways to support them. The overriding message at all meetings was a sense of extreme urgency because many family farmers may not have a lot of time left before

they retire or quit the business.

Center staff members are forming teams to discuss activities for each of the three initiatives and what can be accomplished in the next year, five years and 10 years. Michael Duffy, extension economist and associate director at the Leopold Center, will head the economic policy initiative. Research coordinator Jeri Neal is working on the ecological initiative and Rich Pirog, who has coordinated the center's educational programs, is working on the marketing initiative. Summaries from the conversations and other updates are posted on the Leopold Center's web site under "Leopold Center looks to the future."

Here's a sample of what we heard during the conversations

"Iowans are in denial. Eighty percent of the food eaten by Iowans comes from outside the state. We need to begin to produce more of the food that we eat."

"The picture on your brochure really struck me. What do we want the countryside to look like? This is a farmer issue as well as a community issue."

"Farmers are the original conservationists. They'll try to be good stewards if they can, but sometimes they're between a rock and a hard place. The key is education and making it easier for farmers to voluntarily choose to do the right things."

"Our economic policies need to reward diversity in agriculture. I'd also like to know how present policies help or hurt smaller farmers."

"I like the idea of a local food system. The key is loyalty of people who live in a geographic region. Most large companies rely on standardization and uniformity of a product across the country, but these food systems can offer something that no one can do on a large scale."

"Efficiency of scale will no longer work in a country where labor is no longer cheap."



Center director Fred Kirschenmann listens to ideas at a community conversation at the Neely-Kinyon Research and Demonstration Farm near Greenfield.

Photo by Kathy Rohrig, Adair County ISU Extension

"We need to make conservation a commodity, reward farmers who are caring for their land and build that into public policy so that we subsidize conservation practices and not just commodities."

"Global politics won't save agriculture. We must face the reality of overproduction and use our resources, which can include government subsidies, more wisely."

"Where is agriculture without the people and the communities they support? If we're looking only for the cheapest product, most of our food will come from other countries. We need to tell the consumer that this is happening and bring it to the personal level."

Sometimes the label says it all. Below is the logo for GROWN Locally, a northeast Iowa cooperative that sells to institutions such as local health care facilities.

Farmers' markets have flourished, too. The number has doubled in Iowa since 1985 and help farmers build a customer base, like this Clinton Farmers Market.



Writing new chapters in the local food story

By Rich Pirog
Education coordinator

What is the net effect of local food system projects? All increase the demand for Iowa-grown products, creating more opportunities for small and midsize producers to diversify and add value to their operations.

When we featured an article about local food systems in the *Leopold Letter* six years ago, there wasn't a lot to report. Iowa only had two community supported agriculture (CSA) enterprises, a system by which subscription payments to a farmer buy a box of produce every week during the growing season. "All-Iowa" meals were almost unheard of, and there were no organized efforts to provide Iowa-grown and processed products to restaurants, schools and other institutions that served meals.

Things have changed a lot in six years! Today there's considerable interest and activity in finding local and regional markets for Iowa producers.

- More than 50 CSAs will operate during the 2001 growing season in Iowa.
- The number of institutional buying projects—where Iowa farmers and processors sell food to area restaurants, hotels, schools and hospitals—has increased from one effort in 1997 to more than a dozen this year.
- The number of producers participating in direct-marketing enterprises or in supply networks also has increased to include organic operations or transitional systems with less reliance on external inputs such as pesticides, fertilizers, sub-therapeutic antibiotics or growth additives.
- Starting with a local food brokering project, Practical Farmers of Iowa (PFI) has established a successful producer supply network for restaurants and other institutional markets. In addition, a small farm cluster project led by PFI and Iowa State University is working with eight groups of farmers to develop local production, processing and

marketing enterprises.

- The Iowa Farm Bureau Federation cafeteria began serving Iowa-grown foods in 1999 at its West Des Moines headquarters. The cafeteria is operated under contract by Sodexo Marriott food services, one of the largest food service contractors in North America. Sodexo Marriott works with distributors such as Loffredo Fresh Produce who buy their products from Iowa producers. Sodexo Marriott may expand this effort to other clients in central Iowa and possibly the entire state.

What is the net effect of these and other local food system projects? All increase the demand for locally-grown products, creating more opportunities for small and midsize producers to diversify and add value to their operations. For these efforts to grow, however, several challenges must be met. One of these challenges is to develop a locally-owned infrastructure that does the following things:

- Provides sufficient profit margins for growers,
- Ensures consistent supply and quality of product at competitive prices,
- Establishes a reliable statewide grower network,
- Allows for ease of ordering and communication for the buyer, and
- Provides access to washing, packing, and processing facilities and, in the case of processed products, access to commercially licensed test kitchens to develop new products and to maintain quality and safety standards.

Existing distribution systems for conventional products are in place, and could be used to

LOCAL FOODS

(continued on next page)

The Farm Bureau Federation cafeteria last year served 46 cases of asparagus, 48 cases of melons, 86 cases of strawberries, 1,000 pounds of beef and 120 pounds of pork chops, all Iowa grown.



How do you describe a local food system? The first words that come to mind are fresh, crunchy, green and natural. However, the best definition of a local food system goes beyond niche markets, specialty products, value-added enterprises, and food pathways. It involves building networks and relationships between producers, processors, retailers and consumers in their own communities. Consumers purchase food that comes with a story they are willing to support.

On these two pages are some of the stories of successful local food system efforts in Iowa over the past several years. They were highlighted in a presentation prepared by Rich Pirog for the Iowa Community Agricultural Food Enterprises (CAFÉ) workshops led by Practical Farmers of Iowa. (See about this group's new directions in story on next page.)

The workshops, offered in five locations throughout Iowa during May and June, were designed for educators and other professionals who work with Iowa farmers.

LOCAL FOODS

(continued from page 10)

supply Iowa grown products. A key to sustainability in supplying local foods to these systems is whether growers in the supply networks have enough profit margin to make a good living. Growers who want to distribute, process or market their own products also need access to capital for washing, processing and packing facilities.



Neil Hamilton, left, and grower Larry Cleverley at the Des Moines market

Food policy council gets green light

A governor's council that has been working to strengthen Iowa's local food system will continue for another year.

Iowa Governor Tom Vilsack has extended the life of the Iowa Food Policy Council, a group that met nine times during the past year to advise the governor on all aspects of food policy in Iowa. In April, the Council issued its final recommendations including creation of two inter-agency task forces to improve food security and promote Iowa-grown food products. Chaired by Drake law professor Neil Hamilton, the Council also advocated stable and ongoing support for programs funded by the Iowa Groundwater Protection Act, including the Leopold Center and its work on local and regional food systems.

"A consistent theme of the report is the need for Iowa to promote the use of Iowa-grown food, especially within state institutions," Hamilton said. "We are eager to continue the work we've started and help see our recommendations implemented."

The Council is composed of members appointed by the governor. They have a variety of backgrounds including local producers engaged in direct marketing; local food processors, distributors and food retailers; extension specialists; educators and people involved in urban agriculture; and experts in agricultural policy and law, hunger prevention and food security. Non-voting members include representatives from the Iowa Department of Agriculture and Land Stewardship, Iowa Department of Economic Development, Iowa Department of Public Health and Iowa Department of Human Services.



Rudy's Tacos, a Waterloo restaurant, has more than doubled the local produce and meats that it uses, thanks to a project funded by the Leopold Center. Below, a community supported agriculture enterprise, or CSA, is one example of a local food system.



Photos on these two pages provided by the following people: GROWN Locally, Michael Nash; Clinton Market, IDALS; cafeteria, Farm Bureau Federation; Des Moines market, Larry Cleverley; Rudy's Tacos, Rich Pirog; CSA produce, Shelly Gradwell.

Leopold Center continues partnership with farmer group

PFI explores new directions

By Laura Miller, Newsletter editor

- *Your grove produces some of the best hickory nuts around, and you have a bumper crop this year. Where can you sell them?*
- *You're a midsize conventional livestock producer and wonder about alternative markets that might pay a premium. Does it pay to make the transition?*
- *You're a small-scale market gardener and want to diversify by serving wholesale markets, such as upscale restaurants. But you don't see yourself as a good marketer. What should you do?*

Such topics have been fodder for coffeeshop talk for years. This friendly forum may no longer be an option for many producers who are working second jobs, covering multi-farm operations or competing in a tight marketplace.

But there may be other avenues for advice, says Robert Karp, selected in February to be the first executive director of Practical Farmers of Iowa (PFI). One of his first tasks has been to set a direction for PFI, which has worked closely with the Leopold Center throughout much of PFI's 15-year existence.

Marketing cooperators

One direction he would like to explore is the idea of marketing cooperators—farmers who have participated in alternative markets and are willing to share their experiences. With the support of a statewide network of marketing cooperators, Karp would like PFI to help at least 50 Iowa farmers each year find new market opportunities.

"Doing on-farm research with replicated trials is one way of gaining important knowledge, but there are other types of research we can learn from," Karp explains. "For example, when a farmer learns how to profitably sell pork raised in a hoop barn to a grocery store or at a farmers market, and keeps good records, it's a form of research that can have enormous value for other farmers."

Marketing cooperators could be patterned after PFI's successful and unique on-farm research program. Each year, 25 to 30 PFI farmer-members, called research cooperators, conduct trials and host field days that attract more than 1,000 visitors. On-farm research topics have included nitrogen

About Robert Karp

Title: Half-time executive director, Practical Farmers of Iowa. He also continues work with PFI's food systems program.

Educational background: BA in English Literature, MS (in process) in Educational Leadership and Policy Studies at Iowa State University.

Work experience: Helped organize the Magic Beanstalk, one of Iowa's first community supported agriculture enterprises, in 1995. Started and co-directed PFI's Field to Family project, from 1996 to 2000. Has also worked as a counselor, publisher, teacher and stage manager.

Family background: Born in Janesville, Wisconsin, grew up in Arizona, and returned to the Midwest in 1993.

Contact: (515) 233-3622, or email rkarp@isunet.net

application studies and hoop house related issues such as composting waste and parasite control in livestock. Other cooperators have explored topics related to vegetable production such as controlling cucumber beetles, weed management and the effectiveness of weed flaming and various organic practices.

Karp would like to connect PFI's on-farm research more strongly with its food systems program and work in alternative market development. He said he feels that farmers need more help with business planning, market development and learning to cooperate effectively.



Photo courtesy Guthrie County ISU Extension

Robert Karp presents at one of five direct market training workshops during May and June that attracted more than 300 people. PFI headed the effort with help from the Leopold Center and other groups.

Formal partners since 1998

In February 1998, the Leopold Center signed a formal agreement with PFI to support a portion of its on-farm research and outreach program as a way to develop more integrated and effective sustainable agriculture practices in Iowa. The agreement provided \$50,000 a year, to be reviewed after three years. In the upcoming year, both organizations are evaluating current programs.

"We're very grateful to the Leopold Center and we're also very excited about where our work together might go in the future," Karp says.

When the nonprofit organization was founded in 1985, most of the member-producers were innovators and early adopters of alternative methods of agriculture. "Now we are trying to address the needs of a wider circle of farmers," he adds, "and we need to be sure that all we have learned is readily available along with adequate technical assistance."

Ultimately, Karp said he sees PFI as a community that nurtures people's creativity and passion for farming, which can maintain people through tough times. He also sees an increasing number of non-farmers joining PFI because they can relate to the vision they have for Iowa agriculture.

"Our strength has always been in the wisdom and vision of our members throughout the state."

For a schedule of summer Field Days and Community Days, go to the PFI web site, http://www.pfi.iastate.edu/Calendar/Field_Days_2001.htm or call (515) 294-5486 for a printed brochure.

Leopold Center announces projects, program changes

By Jeri Neal
Research coordinator

As the Leopold Center competitive grants program enters its 14th season, changes are underway. The Center—currently in the middle of a visioning and program evaluation—suffered serious budget reductions in the recent Iowa legislative session.

Historically, this program has been operated on an annual basis. A call for preproposals usually is issued in the summer for an early September submission. Proposals are accepted in November, evaluated over the winter, and approved in the early spring. Funding is initiated for new projects (or renewed for ongoing projects) on July 1, in keeping with the state fiscal year.

The planned visioning and program evaluation, which would consider size, performance and potential to support the new initiatives currently under design at the Center, is likely to change the structure of the competitive grants program. The recent budget cuts, however, impact our ability to maintain funding for the competitive grants program as it is currently structured.

What happens now? First, the Leopold Center plans to honor current commitments to investigators that were made late last winter for funding this year. You can read about the work of these investigators in the summaries on pages 13-19. However, we are not issuing a new call for preproposals (2003 RFP) this summer, and we have initiated a project-by-



FY2002 Leopold Center grants at a glance

- Agriculture and Community (3 new grants, 5 renewals)
- Agroforestry and Niche Products (2 new, 1 renewal)
- Crop and/or Forage Systems (3 new grants, 6 renewals)
- Livestock Management (2 renewals)
- Nutrient Management (8 renewals)
- Pest Management (1 new grant, 6 renewals)
- Soil and/or Water Quality (2 new grants, 3 renewals)

Many of these projects are multi-disciplinary. Additional work is being carried out by the Center's interdisciplinary research issue teams.

project evaluation to identify where and how the budget cuts will be absorbed. The evaluation is not just for competitive grants, but for all Center-funded projects and initiatives. As part of the new visioning and program redesign already on the drawing board, this evaluation will become an integral part of deciding how Center programs can effectively catalyze change in Iowa agriculture. And that is something to get excited about!

On the following pages are the summaries for the eleven new projects and 31 renewing projects in the 2002 competitive grants program.

FY 2002 NEW GRANTS



Agriculture and Community

Sustaining Agricultural Producers through Direct Marketing of Processed Foods, year 1 of 3, **\$6,100**; C. Chase, Black Hawk County ISU Extension, Waterloo—This education and demonstration project investigates potential returns for farmers who are considering the switch from commodity to food crops. Investigators will first focus on demand and profitability for various processed food products, and then look at related food business startup issues, from production and safety to planning and market development. (2002-16)

Local Food Connections: From Farms to Restaurants, year 1 of 2, **\$12,000**; R. Karp, Practical Farmers of Iowa, Ames—Drawing upon experience in their local food systems program, investigators are developing information for a four-page fact sheet and resource manual for producers who want to market products to restaurants. Topics will include post-harvest handling, quality control, pricing, pack-

aging, marketing, customer relations, legal/health issues and producer cooperation. (2002-29)

Developing a Local Food System in Association with Business and Industry, year 1 of 3, **\$20,560**; W. Johnson, Limestone Bluffs RC&D, Maquoketa—A group of agricultural producers, in conjunction with local businesses and a sheltered workshop, will create a local food subscription sales demonstration project. Plans include three sites for distribution of fresh and frozen local foods and preserved products. The goal is to raise awareness and demand for local products, and introduce season-extending and value-added opportunities for local producers. (2002-67)



Agroforestry

Black Walnut Cultivar Performance, year 1 of 3, **\$1,000**; B. Hanson, Iowa Nut Growers Association, Centerville—Members will plant a number of black walnut cultivars at

several sites throughout Iowa and track costs and performance. Their data will be used in an Iowa black walnut cultivar selection guide that is being developed for growers and serious hobbyists. (2001-01)



Crop and/or Forage Systems

The Value of CRP Filter Strips for Grassland Bird Communities, year 1 of 2, **\$5,000**; L. Best, Department of Animal Ecology, ISU—The investigator plans to evaluate bird use and bird productivity in CRP filter strips to determine if the strips represent a boon or an ecological trap. The study will document species composition, abundance and nesting success in conjunction with strip width, plant species and proximity of woody vegetation for both game and nongame birds. (2002-04)

Development of Switchgrass as a Viable Agricultural Commodity for Farmers in Southern Iowa, year 1 of 2, **\$9,000**; M. Braster, Chariton Valley RC&D, Centerville—This project continues funding to develop and distribute information and educational materials for the multi-county, multi-agency Chariton Valley Biomass power project. Topics include establishment and management of switchgrass for biomass, carbon sequestration, water quality, and the economics and additional environmental impacts of these processes. (2002-26)

Incorporating Grassland Agriculture Into Row Crop Production Systems, year 1 of 3, **\$20,000**; M. Mensching, USDA-NRCS, Knoxville—The project goal is to increase farmer use of grass-based conservation alternatives in Madison, Warren, Marion and Mahaska counties. Planned activities include workshops, surveys, analysis and on-farm demonstrations about critical area seeding, contour buffer strips, grassed headlands, grassed waterways, rotational grazing, filter strips and forage and seed production, marketing and comprehensive farm financial analysis. (2002-39)

Sustainable Grape Production for the Reestablishment of Iowa's Grape Industry, year 1 of 3, **\$20,880**; Gail Nonnecke, Department of Horticulture, ISU—In response to increased interest in viticulture in Iowa, experimental field plots will be established in central and southwest Iowa, and on-farm research conducted, in an effort to identify sustainable management tools for growers. Researchers will be primarily looking at plant management issues such as cultivar performance, training systems for vines, and integrated pest management. They also plan to write a producer guide to grape pest management. (2002-46)



Pest Management

The Effects of Thrips on Strawberry Production in Iowa, year 1 of 2, **\$10,770**; J. Obyrcki, Department of Entomology, ISU—Beginning in 1994, strawberry growers adopted regular early-season insecticide applications to control thrips, minute

insects whose feeding habits are suspected of being the agent behind bronzing damage. Investigators plan to document the level of thrips activity, if any, and to determine the actual losses and best management practices to help growers manage strawberry crops (2002-47)



Water Quality

Economically Sustainable Riparian Buffer to Promote Bank Stability and Reduce Gully Erosion and Phosphorus Runoff in the Loess Hills, year 1 of 3, **\$27,500**; J. Kelly, Department of Forestry, ISU—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. Plant materials chosen are those that have potential economic value for owners: cottonwood, black walnut, brome grass and alfalfa mix, and switchgrass. (2002-30)

Understanding the Potential of Phosphorus Transport to Water Resources via Leaching, year 1 of 2, **\$24,064**; J. Baker, Department of Agricultural and Biosystems Engineering, ISU—Most of the current work to determine practices and policies that can reduce the total maximum daily load of phosphorus (P) in water supplies is through gross assessments of P leaching into surface water through subsurface drainage tile flows. Investigators in this project hope to provide new information and understanding about P movement in P-deficient subsoils, and to determine if such soils significantly lose their capacity to remove P over time. (2002-40)



These three little pigs are spending their days in a hoop barn at the Iowa State University Research and Demonstration Farm near Rhodes. Their home is part of the Leopold Center-funded hoops project. Pigs are being raised in hooped structures at ISU facilities near Rhodes, Atlantic and Castana, and are open for tours. For summer field day schedules, check www.ag.iastate.edu/farms/fielddays.html.



Agriculture and Community

Establishment of a Local Food System in Eastern Iowa, year 3 of 3, **\$25,800**; W. Jones, Johnson County Soil and Water Conservation District, Iowa City—Activities in this project include linking producers and restaurants, serving all-Iowa meals, developing a producer directory, and collecting sales and cost data to help build a local food system in Johnson and surrounding counties. Investigators hope to increase commerce between local producers and consumers, strengthen rural-urban ties, and help the public better understand the environmental, economic and social implications of sustainable local food production. (2000-26)

Sustainability and Community Food Systems in Four Iowa Counties, year 3 of 3, **\$20,005**; C. Hinrichs, Department of Sociology, ISU—Statewide there is increasing interest in niche markets and local food, but little is known about the nature and dynamics of local food systems, or about how a broader community food system might be developed. Investigators are working in Benton, Audubon, Marshall and Johnson counties to collect information about food and food retailers (production, processing, distribution, service, consumption, security, education, and policy). They are conducting field interviews of food system ventures (farmers markets, small-scale processors, community supported agriculture groups, etc.) and traditional food system outlets (lockers, independent grocers, congregate meal programs). (2000-69)

Institutional and Commercial Food Service Buyers' Perceptions of Benefits and Obstacles to Purchase of Locally Grown and Processed Foods, year 2 of 2, **\$16,224**; C. Strohbehn and M. Gregoire, Department of Hotel, Restaurant and Institution Management, ISU—Preliminary findings indicated the greatest perceived benefits of purchasing food locally were good public relations, fresher products, the ability to purchase smaller quantities, and aiding the local economy. The greatest obstacles were availability of a year-round and adequate supply, local and state regulations, and dealing with more vendors. Food safety was of some concern to food buyers, but was not rated as the greatest concern. During the next year investigators will visit 10 sites within 120 miles of Ames for in-depth evaluation of these issues. They also will collect food samples for bacterial analysis. (2001-38)

Planning for Grass-Based Dairies and Dairy Networks/Promotions, year 2 of 2, **\$35,000**; B. Beaman, Ag Connect, Lenox—Ag Connect is leading an initiative to promote, provide information for, and help establish a grass-based dairy network in southern Iowa. They have helped four producers start new grass-based dairy operations, and are working with two other area producers. The grant provides funds for investigators to visit farms and related dairy businesses, to enlist "mentor" operations, to collect input and expertise from dairy specialists and analysts, and to conduct interviews to identify strong candidates for the goal of successfully establishing 12 grass-based dairies in southern Iowa. (2001-32)

An Internship Program to Help Institutional Food Buyers Develop Links to Local Farms in Northeast Iowa, year 2 of 3, **\$17,000**; K. Enshayan, Center for Energy and Environmental Education, University of Northern Iowa—The primary goal in this project is to facilitate a stable local food-buying process by placing trained interns in several hospitals and nursing homes, and with other large food buyers. Investigators are monitoring farmer income and satisfaction, and preparing a manual that summarizes the barriers and opportunities for incorporating local food into institutions. Five institutions are interested in joining the project in addition to five who already are a part of the program. (2001-13)



Agroforestry

Iowa Location for Pawpaw Regional Trials, year 3 of 3, **\$515**; P. O'Malley, Johnson County Extension, Iowa City—This project established a site in Louisa County to evaluate the potential of the indigenous pawpaw fruit as a commercial crop for Iowa. After two growing seasons, the survival rate is 81 percent. This may be slightly depressed by some early planting and mowing accidents with the trees, but the effects of these incidents also may have been offset by a slightly inflated survival rate from the mild winter of the first year. Twenty additional trees grown from seed of a wild Louisa county population were planted in spring 2000 at Nashua. These trees will help identify cold hardiness in the species. The project is part of a regional trial conducted by the Pawpaw Foundation to evaluate 28 varieties for fruit and growth characteristics. (2000-20)

Crop and/or Forage Systems

Evaluating the Adaptability of Forage Species and Varieties in Northwest and South Central Iowa, year 2 of 3, **\$4,200**; D. Haden, ISU Northwest Research and Demonstration Farm, Sutherland—Stands of legumes and grass species are being evaluated at Doone and McNay research farm sites to determine regional adaptation, longevity and forage traits. In the legume studies, 'Rhizo' kura clover, 'Windsor' cicer milkvetch and 'Bigbee' berseem clover are being compared to 'Marathon' red clover, 'Jade II' alfalfa and 'Norecen' birdsfoot trefoil. The eight grass species and varieties include 'Pete' Eastern gamagrass, 'Barenbrug' perennial ryegrass, 'Sikem' annual ryegrass and 'Cheyenne' bermudagrass to be evaluated against 'Bounty' smooth bromegrass, 'Duke' orchard grass, 'Climax' timothy and an endo-free tall fescue. Stands were established last year, and first forage harvest is scheduled in June of 2001. (99-41)

Local Ecotype Prairie Seed—An Alternative Agricultural Product for Increasing the Viability of Smaller Farming Operations, year 4 of 4, **\$14,894**; J. Selby and K. Fletcher, The Nature Conservancy, Des Moines—Investigators plan to assess the potential for local ecotype prairie seed as an alternative agricultural product for Iowa through market analysis and on-farm production demonstrations. A diverse seed mix of 45 species typical

of the Loess Hills tallgrass prairie was gathered by machine and hand in the fall of 1998 for use in the 1999 plantings (which occurred both fall and spring). The project has established demonstration sites at Broken Kettle Grasslands on a portion of the Briar Cliff College campus adjacent to the Sioux City Prairie, and on private lands of area cooperators E. Schoenfelder, C. Bobier and R. Stowe. Ongoing maintenance activities include mowing and a prairie burn. *A Practical Guide to Prairie Reconstruction* was published in cooperation with Carl Kurtz. Market analysis will be completed this year. (99-45)

Improving Productivity of Warm-Season Pastures by Interseeding Legumes, year 2 of 3, **\$25,175**; K. Moore, Department of Agronomy, ISU—Growing legumes in mixtures with warm-season grasses could improve the quality of forage to grazing animals, and potentially reduce or eliminate nitrogen fertilizer requirements of a pasture. Twelve annual, biennial and perennial legumes (hairy and crown vetch; crimson, red, white, kura and berseem clover; white and yellow sweetclover; alfalfa; cicer milkvetch and birdsfoot trefoil) were interseeded into existing switchgrass and big bluestem pastures at the ISU Western Research Farm near Castana as part of earlier Leopold-funded work. Using data from strip grazing of beef cattle, cattle weights, forage and soil quality, and legume density and persistence, the investigators are developing site-specific recommendations to optimize warm-season grass pastures for cattle production in western Iowa. (2001-35)

*Development of Dormancy Breaking Mechanisms in Eastern Gamagrass, *Tripsacum dactyloides* L.*, year 2 of 3, **\$20,000**; L.R. Gibson and A.D. Knapp, Department of Agronomy, ISU—Interest in gamagrass has resurfaced in recent years because of its potential value as a forage that livestock prefer, as a possible silage replacement for corn on marginal land, as a grass hedge for control of soil erosion, for wildlife habitat, for biomass production and for reclamation of certain lowland areas and disturbed sites. Unfortunately, eastern gamagrass also boasts a robust seed dormancy mechanism, making it very dif-

ficult to establish. Researchers are working with several seed conditioning procedures to find a way to break seed dormancy in a practical manner, increase germination rate, and speed seedling development. The practical result of the work will be to supply a high-germination dry seed for producers and conservationists. (2001-19)

Evaluating Pork Production Systems for Niche Markets, year 2 of 3, **\$4,000**; D. Stender, Cherokee County Extension—Furthering work begun with an Iowa Pork Industry Center grant, the investigator is working with area producers to establish on-farm baseline data for side-by-side hoop and confinement operations. The investigator is tracking detailed production records including nutrition, labor, bedding and carcass characteristics. Genetic lines will be identified when possible and data kept by season and type of operation. Antibiotic use will be tracked, and on-farm odor and water quality assessment and a building audit will be available for each participant. Three producers signed up for the first year and another three will be added this year. Problems in setting up new farm data tracking software slowed initial work. (2001-10)

Demonstration and Technology Transfer to Producers Implementing Sustainable Rotational Grazing Systems, year 2 of 2, **\$9,550**; M.D. Boswell, Southern Iowa Forage and Livestock Committee, Corning, and B.C. Peterson, Natural Resource Conservation Service, Creston—Using the Adams County CRP farm and producer acres in a multi-county area, investigators plan a series of demonstrations to address issues related to rotational grazing systems. ‘Hands-on’ demonstrations (with attendee participation) include stream crossing/water access, use of Kura clover, establishment and maintenance of legumes into grass-based forage using a no-till drill, incorporation of warm-season grasses into an existing grazing system, installing water distribution systems, and materials and methods for installing electric fence, including New Zealand-style electric fence. (2001-02)

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Jim Russell, who heads the Leopold Center’s animal management issue team, will present information from a study on pasture runoff and buffer strips at the July 10 Rhodes Research and Demonstration Farm field day that begins at 4 p.m.



Livestock Management

Complementary Grazing Systems for Beef Cattle Production, year 3 of 3, **\$21,333**; K.J. Moore, Department of Agronomy, ISU—A grazing study is being conducted at the McNay Research Farm near Chariton to evaluate the impact of legumes and warm-season grasses (smooth bromegrass, birdsfoot trefoil, alfalfa, big bluestem, switchgrass, kura clover) on season-long productivity of complementary grazing systems (systems will be stocked with crossbred steers). Eight complementary and four continuous grazing systems are being evaluated. One of the most striking results to date is the impact of yearly weather on system performance. There are no clear trends on animal performance to date, but work suggests that grazing system stability will be improved with higher species diversity. It is becoming increasingly clear that Kura clover needs to be included in the mix, regardless of grazing sequence. (2000-06)



**Livestock Management/
Soil Quality**

Winter Grazing of Corn Residues: Effects on Soil Physical Properties and Subsequent Crop Yields from a Corn-Soybean Crop Rotation, year 3 of 3, **\$28,819**; D. Busby, Southwest Area Extension Center, Lewis—In several forums, Iowa cattle and grain producers identified the relationship between grazing of corn crop residues and soil physical properties as one of their highest research priorities. This research is looking at the effects of grazing corn residues in different winter months on soil physical and chemical properties, and on subsequent crop production (corn-soybean rotation using either conventional or no-tillage methods). Data also are being collected on monthly cow condition scores and amounts of hay fed. Sites were established with cooperators B. Pellet near Atlantic and G. Hansen near Chariton, and grazing initiated in October and November of 1999, respectively. First-year results indicate that while grazing corn crop residues at the Atlantic location and Chariton location affected soil surface roughness and surface penetration resistance, respectively, the changes did not adversely affect yields of soybean planted with disking or no-tillage in the subsequent year. Grazing of corn crop residues significantly reduced the amounts of hay required to maintain the cows. (2000-35)



Nutrient Management

Soil Amendment Effects on Crop-Weed Interactions, year 3 of 3, **\$19,115**; M. Liebman, Department of Agronomy, and T. Richard, Department of Agricultural and Biosystems Engineering, ISU—This research is investigating how amending soil with compost made from hog manure and cornstalks affects the growth and competitive ability of three weed species commonly found in Iowa corn fields (giant foxtail, velvetleaf and waterhemp). The manure and cornstalk bedding come from swine hoop structures. Investigators are using both field experiments and laboratory analyses to (1) characterize manure properties and application rates; (2) evaluate the impacts of composted manure on corn and weed growth, yield and competitive interactions; and (3) integrate information into a broader study of manure, legume residues, and tillage effects of soils, crops and weeds. Early results suggest that compost application can enhance corn growth and may shift the relative proportions of species within weed communities. (2000-11)

Reducing Anhydrous Ammonia Application by Optimizing Distribution, year 3 of 3, **\$29,754**; M. Hanna, Department of Agricultural and Biosystems Engineering, ISU—In ongoing work to minimize inconsistent application by anhydrous ammonia equipment, researchers are comparing field distribution by a conventional manifold, a vertical dam manifold, a Cold-flo® device and newly available manifolds and pump systems. They also have planned and tested two research manifolds. A wide variation was found between commercial models. This year they will conduct spring and fall manifold tests, including test-

ing of a new manifold designed by the research team, and continuation of the yield study started last year. The yield study helps assess the performance of different manifolds by looking at effective yields under different N rates. (2000-34)

Livestock and the Environment Project in Sioux County, year 3 of 3, **\$ none requested**; K. Kohl and J. DeJong, Buena Vista and Plymouth County ISU Extension, Storm Lake and LeMars—Members of the Northwest Iowa Extension environmental team are determining how producers use manure as a crop nutrient, what barriers deter producer use of manure as a nutrient, and if a new pit-sampling method is useful for producers. Survey work showed that Sioux County producers reduce their commercial fertilizer applications when manure is applied; producers who tested their manure were much more likely to take credit for the manure nutrients and made greater reductions in commercial fertilizer; and most producers who tested their manure believed that manure was better than or equal to commercial fertilizer. Early results of the surface pit sampling method showed it to be a better predictor of nitrogen and potassium than profile samples, and showed the profile samples to be a better predictor of phosphorus levels. (2000-36)

Environmental Impacts of the Use of Poultry Manure for Agricultural Production Systems, extended to year 4 of 3, **\$12,500**; R. Kanwar, Department of Agricultural and Biosystems Engineering, ISU—The project is monitoring two application rates of poultry manure and commercial fertilizer nitrogen on corn and soybeans for leaching of NO₃-N (nitrate-nitrogen), PO₄-P (phosphate-phosphorus), and pathogenic bacteria to subsurface drainage water and shallow groundwater. The work shows that excessive use of poultry manure may increase pollution potential of water resources from nutrients and bacteria. However, poultry manure applications at a rate of 168 kg-N/ha resulted in the lowest NO₃-NO, PO₄-P in subsurface drain water, and had a higher corn and soybean yield than the other treatments. This is a significant finding for use of poultry manure as a nutrient source for agricultural crops. Variations in rainfall, land slope, and hydraulic properties of the plots have made it difficult to identify significant trends in runoff concentrations. (99-68)



**Nutrient Management/
Soil Quality**

Optimizing Swine Hoop Manure Management for Soil Quality and Crop System Performance, year 3 of 3, **\$28,676**; T. Richard and M. Liebman, Departments of Agricultural and Biosystems Engineering and Agronomy, ISU; D. Exner, Practical Farmers of Iowa and ISU Agronomy; C. Cambardella, USDA-ARS National Soil Tilth Lab—Researchers plan to continue on-farm and research station experiments to evaluate the impacts of alternative hoop manure management strategies (corn/soybean rotation, composted manure, bedded manure,

Want to plant a prairie? Check out the book, *A Practical Guide to Prairie Reconstruction*, by Carl Kurtz from the University of Iowa Press. Publication of the book was funded as part of a Leopold Center competitive grant to the Iowa Chapter of The Nature Conservancy.



spring and fall applications) on soil quality and cropping system performance. Data is being collected on farm management, compost and bedding composition, soil biochemical properties, soil microbial biomass, crop biomass and macronutrient content, and seed yield data. Six on-farm cooperators and research stations at Rhodes and Boone are included in the project. (2000-42)

Optimizing Solid Manure Application by Improving Distribution, year 2 of 3, **\$29,400**; M. Hanna, Department of Agricultural and Biosystems Engineering, ISU—Solid manure application, which has environmental benefits and could substitute for commercial fertilizers, would be more acceptable to farmers if they could rely on uniform application. Researchers are evaluating the uniformity of existing spreaders, make recommendations for operating strategies that will improve uniformity, and developing a prototype solid manure applicator with improved application performance. Initial work shows trends based on load phase, apron delivery speed and swath overlap. Most application occurred directly behind the spreader, so overlapping swaths by using travel lanes of similar width to the spreader was required to improve lateral distribution. Using overlapping patterns at reduced application rates may require reduced apron delivery speed or increased tractor ground speed to avoid overapplication. (2001-24)

Agronomic and Environmental Soil Testing for Phosphorus and Threshold Levels in Soils, year 2 of 3, **\$24,000**; A. Mallarino, Department of Agronomy, ISU—The overall goal of the project is to provide practical information for more efficient use of phosphorus (P) resources in agronomic settings. Preliminary results suggest that incorporating fertilizer or manure into the soil by chisel plowing or disking after a broadcast application, or by subsurface banding or injection in no-till or

chisel-plow systems, will markedly reduce the accumulation of P in the top 2 to 3 inches of soil without affecting grain yield. Agronomic and environment soil P tests could both be similarly correlated to dissolved P in field plot runoff. No test was not correlated with P loss in the tile water, probably because P loss through this mechanism was very low this first year. Relationships of rates and methods of P application, soil P, and P concentration in water are being used to help develop the Iowa P index. (2001-11)



Pest Management

Managing Weeds by Integrating Smother Plants, Cover Crops and Alternate Soil Management, year 4 of 4, **\$34,460**; D. Buhler and K. Kohler, USDA-ARS National Soil Tilth Laboratory—This research looks at weed management alternatives: encouraging “untimely” weed emergence through tillage soil disturbance, management of the light environment, and management of cover crop and surface residue; and on developing spring-seeded smother plant systems that can provide consistent weed control without sacrificing crop yield. Results in 1999 and 2000 were encouraging for tillage timing and use of smother/cover plants as weed control options. Cover crops, especially rye, tend to reduce corn yield. Upcoming work will focus on cover crop densities. (99-03)

*Effects of Transgenic *Bacillus thuringiensis* Corn Pollen on the Monarch Butterfly, *Danaus plexippus** (Lepidoptera: Danaidae), year 2 of 2, **\$24,120**; J. Obrycki, Department of Entomology, ISU—The monarch butterfly is a species likely to be affected by the increasingly widespread plantings of Bt corn. Previous research has shown that Bt insecticide sprays can have negative effects on nontarget moth and butterfly species. The objectives of the research are to 1) determine the sub-lethal effects of Bt corn pollen exposure on monarch larval development and adult characteristics, 2) quantify the use of milkweeds adjacent to Bt and non-Bt corn fields by monarchs, and 3) compare the survival of experimental cohorts and natural populations of monarchs adjacent to Bt and non-Bt corn fields. During the first year, higher than expected incidences of natural mortality occurred in the monarchs, precluding any preliminary conclusions on the objectives. (2001-58)

Investigation of the Influence of Tillage for Management of Woolly Cupgrass, year 2 of 4, **\$10,375**; M. Owen, Department of Agronomy, ISU—Woolly cupgrass continues to be a problem weed in corn and soybeans. This research will look at woolly cupgrass response to various management practices such as tillage methods, tillage timing and chemical control, and make recommendations for effective management systems. Experiments include a tillage/herbicide field experiment to determine woolly cupgrass seed production, soil profile placement and seedbank number; and a tillage timing experiment to look at cupgrass mortality, germination and emergence. No management recommendations are expected until the experiment is further along. (2001-56)

Biotic Interference of Biological Control of Purple Loosestrife (Lythrum salicaria), year 2 of 3, **\$8,290**; J. Obyrcki, Department of Entomology, ISU—In an earlier grant, the Leopold Center and Iowa Department of Natural Resources funded a biological control program to develop a mass rearing and release program for *Galerucella* beetles, natural enemies of an invasive, exotic wetland plant (purple loosestrife) that is overpopulating water features in the state. However, the expected reduction in plant density has not been recorded. This project is investigating several ecological interactions, such as identifying arthropod predators and quantifying predation at different life stages, to identify strategies that will improve the effectiveness of the beetles as a biocontrol agent. (2001-33)

Development of Sporidesmium sclerotivorum as a Biocontrol Agent for Sclerotinia Stem Rot of Soybean, year 2 of 2, **\$9,875**; C.A. Martinson, Department of Plant Pathology, ISU—Current management schemes for white mold in soybeans involve the application of pesticides, use of wide rows and/or planting lower-yielding tolerant varieties. Prior Leopold Center research has found that *Sporidesmium* spores applied to soybean fields after a white mold epidemic will reduce the amount of disease in a subsequent soybean planting by 50 to 100 percent. Further management information for farmers is needed, as is a better method of mass producing the spore itself. Work during the first year included: evaluation of control of white mold over four years of prior application of *S. sclerotivorum* spores; evaluation of the survival and spread of those same spores; work on improved methods for inoculum production; and establishment of additional field experiments. (2001-26)

Evaluating Sustainable, Integrated Management of Muskmelon Diseases, Weeds and Insect Pests in Partnership with Iowa Growers, year 2 of 3, **\$20,361**; M. Gleason, Department of Plant Pathology, ISU—Muskmelons are one of the most widely grown and highest-value crops in Iowa, offering producers the opportunity to rapidly diversify and enhance cash flow. Using research plots and commercial grower farms, investigators are testing management techniques to reduce synthetic chemical use without sacrificing crop quality and yield. First-year results were very positive for the “Melcast” weather-based disease warning system, and also gave some strategic direction to effective sticky trap use. Soil dwelling bacterium that combat anthracnose (*B. acillus subtilis*) had good results, and hairy vetch and winter rye cover crop plots were established. (2001-21)



Water Quality

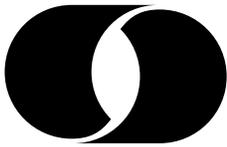
Evaluating the Effectiveness of Restored Wetlands for Reducing Nutrient Losses from Agricultural Watersheds, year 2 of 3, **\$26,637**; A. Van der Valk, Department of Botany, ISU—The goals of this project are to examine the effectiveness of restored wetlands within the Iowa Great Lakes watershed to reduce nutrient losses; to determine if subwatershed nutrient exports can be reduced further by altering the location, size, design and/or management of restored wetlands; and to recom-

mend workable guidelines for using wetlands as effective nutrient sinks. Initial work has included nutrient loss estimations, selection of restored wetlands for sampling, and collection of digital data layers for the modeling effort that would describe nutrient action in the subwatersheds. (2001-60)

Impact of Swine Manure Applications on Phosphorus, NO⁻ and Bacterial Concentrations in Surface Runoff and Subsurface Drainage Water, year 2 of 3, **\$27,010**; R. Kanwar, Department of Agricultural and Biosystems Engineering, ISU—The goal of this research is to demonstrate the impact on surface and groundwater quality of liquid swine manure application when application is based on nitrogen and phosphorus needs of crops. Comparisons are being made between sources of nitrogen (liquid swine manure and liquid urea-ammonium nitrate, UAN, fertilizer), N application timings, and improved methods of application on six N experimental treatments. The treatments are: N application from liquid swine manure and UAN at rates of 150-lb./acre; P applications from liquid swine manure to meet P-uptake requirements for corn and soybean with supplemental N application of UAN to meet N-uptake needs of corn; 150-lb./acre application of N from UAN to corn using a Localized Compaction and Doming applicator; and a 150-lb./acre application of N from swine manure using no-tillage conditions. The study is tracking transport of NO⁻-N, PO⁻-P and bacteria to surface runoff and subsurface drainage water. The work is being conducted at ISU’s Northeast Research Farm near Nashua. (2001-55)

Soil Carbon Quality and Interactions in Iowa Wetlands, year 2 of 2, **\$26,000**; T. Fenton, Department of Agronomy, ISU—Wetlands provide many useful economic and environmental traits, from fishing to wildlife to water quality improvement. But significant changes in land use may have altered the natural potential of wetlands to participate in nutrient cycling and water quality maintenance. Researchers are examining soil chemical and physical variability, carbon sequestration, water movement, microbial processes and denitrification in three north central Iowa wetlands in the Des Moines Lobe to assess the ecology of similar Iowa wetlands. The wetlands contain sites under natural conditions and also under restoration management periods of 1, 5 and 15 years. Researchers hope to use data to assess the ecology of similar Iowa wetlands. (2001-47)





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CALENDAR OF EVENTS

July 17-19—Upper Midwest Grazing Conference, Dubuque. Contact: Larry Tranel, ISU Extension, (319) 583-6496 (ext. 14).

August 20—A Taste of Local Foods, Washington. Contact: Ed Raber, Washington (Ia.) Economic Development Corp., (319) 653-3942.

August 21—Farm Field Day, Neely-Kinyon Farm, Greenfield. Contact: Kathy Rohrig, (641) 743-8412.

September 7—Human Health and the Environment: Iowa Problems, Iowa Solutions, Des Moines. Contact: Mark Lambert, Iowa Environmental Council, (515) 244-1194.

September 18 (tentative)—Pork niche marketing conference, Ames. Contact: Iowa Pork Industry Center, (515) 294-4496, or Leopold Center, (515) 294-3711.

November (date to be announced)—Skill Development for New Iowa Commercial Wineries, (central Iowa location to be announced). Contact: Paul Tabor, Iowa Grape Growers Association, (563) 673-3131.

November 6-10—National Interpreters Workshop, Des Moines. Contact: Jim Pease, ISU Extension, (515) 294-7429.

November 8—A Sense of Wonder, A one-woman play on the life of Rachel Carson, Iowa State University, Ames. Contact: Leopold Center, (515) 294-3711.

NOTE: All events receive partial funding from the Center's conference and workshop program, or Center staff are involved in planning or presentations.

Additional info...A diverse group of stakeholders is expected to gather for the Midwest Working Landscapes Conference, November 8-10 in Delavan, Wisconsin. A working landscape encourages sustainable agriculture, forestry and other related industries, as well as supporting communities within a particular watershed. The Leopold Center is one of a number of groups and government agencies to sponsor this effort. For information, contact Marin Byrne, Institute for Agriculture and Trade Policy, (612) 870-3436. An electronic forum for discussion topics can be found at <www.iatp.org/enviroag/>.