

1997-1998 Annual Report

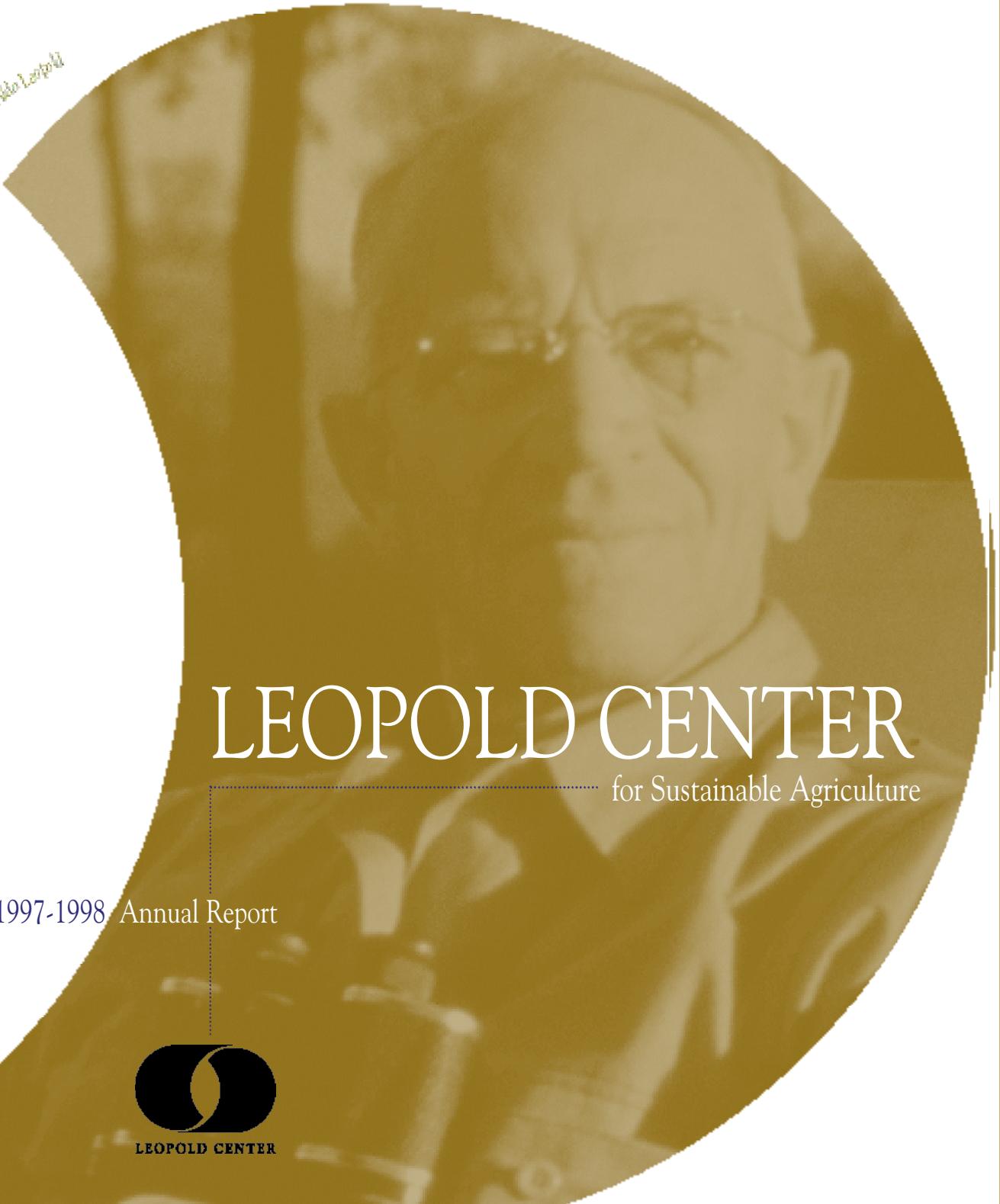


LEOPOLD CENTER

for Sustainable Agriculture

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*"A conservationist is one who is
happily aware that with each stroke he is writing his signature on
the face of his land." — Aldo Leopold*



LEOPOLD CENTER

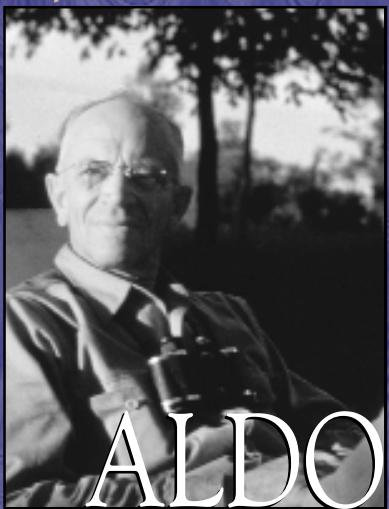
for Sustainable Agriculture

1997-1998 Annual Report



LEOPOLD CENTER

1886-1948



ALDO LEOPOLD

The conservationist, ecologist,
and educator for whom the
center was named.

1997-1998

Annual Report

Edited by Mary Adams • Graphic design by Juls Design, Ankeny, Iowa
Photos by Leopold staff and PhotoDisc except where noted.

The Leopold Center was established by the Iowa Legislature as part of the Iowa Groundwater Protection Act of 1987. Its mandated missions are to identify impacts of agricultural practices, contribute to the development of profitable farming systems that conserve natural resources, and cooperate with Iowa State University Extension to inform the public of new findings.



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

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D i
Keeney



PHOTO BY: ROD SWOBODA

THOUGHTS

Letter from the director

2

"A thing is right when it tends to preserve the integrity, stability,

and beauty of the biotic community. It is wrong when it tends otherwise."

Aldo Leopold

A legacy is defined as something transmitted or received from an ancestor. It might be an heirloom jewel, or a priceless portrait, or enough money to achieve financial independence. For the Leopold Center, Aldo Leopold's legacy is less a material offering than a moral imperative. The most famous utterance of the pioneer ecologist for whom the Center was named is "A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise." The Center's advisory board and staff strive to make workplace decisions using Leopold's land ethic as a guideline. This makes the Leopold Center unique among land grant college of agriculture research centers in that no other unit has such a clearly stated mandate for displaying an ecological conscience!

Center staff members have done a fair amount of thinking about Aldo Leopold's legacy in the past year, partly because of the celebration of the Center's tenth anniversary and partly because in April 1998 we, along with many other national conservation organizations, marked the 50th anniversary of Aldo Leopold's death. If he were to appear in ISU's Curtiss Hall today, he would be gratified by the strides that have been made in some areas, and he would no doubt be appalled at the changes some of the marvelous new technologies have wrought on the landscape.

A *Sand County Almanac*, Leopold's most succinct statement of his credo, and in particular the capstone chapter, "The Land Ethic," offer the best available look at the Leopold legacy. This is required reading for those associated with the Center, and over the years we have passed out thousands of free copies because we know that there are few things more powerful than Aldo Leopold's own words on the subject. But even with Leopold's compelling words in front of us, the Center must strive continually to make those words a reality under the pressures of farming in 1998.

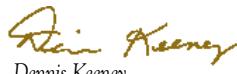
Leopold's legacy and the Center's performance

Living out Leopold's legacy takes simple forms sometimes. In the process of considering funding for the various proposals during the competitive grants process, we may ask ourselves, "Would Leopold like this idea?" or "Would Leopold see this as something that improves the health of the land?" Trying to apply the Leopold legacy to modern scientific practices can be a powerful clarifying device.

Leopold's concept of expanding "community" to include the soils, waters, plants, and animals has set us to thinking about how we can expand our sense of community so that we promote rural regeneration (rather than degradation). We are thinking of community not only in terms of the soils or watersheds, but in terms of the small towns and rural areas that have suffered in recent years. The way is not yet clear, but we are experimenting with projects that will encourage local entrepreneurship and involvement as well as more linkages between local food systems and consumers.

Sometimes honoring Leopold's legacy means standing behind programs that may not find supporters within the mainstream of agricultural research—and putting our money where our mouths are. This year the Leopold Center made special funding arrangements with Practical Farmers of Iowa to continue their on-farm demonstration and research programs. The Center also made substantial start-up contributions to an initiative studying the viability of hooped hog houses for Iowa swine production and to a long-term program of study on the future of organic agriculture in Iowa.

Members of the Leopold Center staff and advisory board will continue to use Aldo Leopold's legacy as a guide for their actions even after this anniversary year ends. This is a legacy that doesn't have to languish in a bank vault or be "managed" by a consultant. In Leopold's words, it is something we can use every day to "reflect a conviction of individual responsibility for the health of the land."


Dennis Keeney

QUESTION

Duffy testifies before national panel on small farms

H.S. Secretary of Agriculture Dan Glickman convened a Commission on Small Farms and conducted five hearings at different sites around the country in 1997. Michael Duffy, the Center's associate director, spoke before the 27-member panel meeting in Sioux Falls, South Dakota, in August.

Duffy's charge was to answer the question, "How can small farms compete in a big economy?" He spoke about his experiences examining farm size and efficiency as well as the structure of agriculture in Iowa. Ultimately he said that a small farm must sustain its net income to survive.

Some small farms are trying to compete by imitating large farms, but the small farms must capitalize on their unique flexibility if they are to succeed. Too often, Duffy noted, big is automatically equated with efficiency and small with inefficiency. But he has collected research data that indicates there are greater variations in profitability *within* size groups than between them.

He suggested that much of the concern over small farms originates from uneasiness about changes in the structure of agriculture. For instance, in Iowa many farms are multi-family or multi-operation farms (which tend to be family operations).

Forty-four percent of those who considered farming their principal occupation were over 55 years old. Iowa reported 98,000 farms, but only 14,700 considered farming their main occupation.

Duffy offered several suggestions for Secretary Glickman:

- All current and future USDA-funded studies should be size-neutral.
- Public research should help achieve societal goals and leave profit-oriented research to the private sector.
- Consider a broad array of farming options and alternatives to give individual farms a better chance at survival.
- Play on the small farmer's strengths (i.e., management rather than capital).
- Do not confuse feeding the world with wanting the world to be fed. Hunger is as much a distributional and income problem as a production problem.
- Acknowledge that agricultural policy is about more than just increasing production. Quality of rural life is important too.
- Collect better information and data on the structure of the industry.
- Small farms can compete (but not by trying to farm the same way as large farms).



'How can small farms compete in a big economy?'

Duffy's small farms testimony

Curt Meine



EVENTS

4

50th anniversary of Leopold's death
Food systems seminar

Center marks **50th ANN**

The Leopold Center was just one of many environmentally concerned organizations which commemorated the 50th anniversary of Aldo Leopold's death in 1998. On April 21, the Center sponsored a presentation about Aldo Leopold for the Ames community at ISU's Scheman Building. Jean Eells, executive director of the Iowa Conservation Education Council, presented the Aldo Leopold Environmental Educator Award to Duane Toomsen on behalf of the ICEC and the Iowa Association of Naturalists. Curt Meine, author of the biography *Aldo Leopold: His Life and Work*, used slides and text to share with the audience how influences from Leopold's personal life colored his work as ecologist, educator, and writer.

On the following morning, April 22, which was also Earth Day 1998, a tree was planted in memory of Aldo Leopold. An oak was placed on ISU's central campus, southwest of Curtiss Hall where the Center's offices are located. After the ISU groundskeepers prepared the way, Dennis Keeney, Curt Meine, and J. Michael Kelly (chair of the ISU forestry department) offered brief remarks about Leopold and the significance of trees in his career, and then pitched the ceremonial shovels of soil into the hole containing the newly planted oak.

The memorial tree planting ceremony was immediately followed by a lecture on Leopold's philosophical legacy in the ISU Memorial Union Sun Room. Curt Meine spoke once again and his topic was "Aldo Leopold's Land Ethic in the New Century." He traced the origins of Leopold's thinking on the land, the applications to the present, and the potential for future generations who will heed the Leopold message.

With the Leopold Center leading the way, these events were sponsored in part by the ISU departments of animal ecology, agronomy, entomology, forestry, horticulture, sociology, zoology, and genetics as well as the Brenton Center and the Committee on Lectures. Other contributing organizations included the Iowa Conservation Education Council, the Iowa Environmental Council, Story County Conservation Board, Iowa Arboretum, ISU Extension—Story County, Iowa Association of Naturalists, Iowa Natural Heritage Foundation, Nature Conservancy—Iowa Chapter, Practical Farmers of Iowa, and Trees Forever.

On April 23, the focus shifted to Burlington, Aldo Leopold's boyhood home, where he was honored as part of the town's Earth Day commemoration. Children from James Madison Middle School planted three swamp white oaks in front of the school as part of a Leopold tribute. Caryl Leopold Smith, Aldo Leopold's niece, attended and shared memories of her uncle. The program was coordinated by the Burlington chapter of Trees Forever, the Des Moines County Conservation Board, the James Madison Middle School teachers and students, and Roger Hunt of Trees Forever.

IVERSARY

of Aldo Leopold's passing



EARTH DAY IN BURLINGTON, IOWA

Aldo Leopold on cultural values for wild things

"We who labor in conservation are prone to forget that there was a time, within the memory of some still living, when it presented no field for endeavor. Wild things were something to be overcome and forgotten, not something to be preserved and cherished. Man was thought civilized to the extent that he divorced his existence from his own wild origins. The idea of cultural values in wildlife had no painless birth. A whole generation of conservationists had to fight for the recognition of such values, before the present task of preserving them could begin."

From an unpublished piece of writing by Aldo Leopold, read by Leopold biographer Curt Meine at a tree planting April 22 near Curtiss Hall, to commemorate the 50th anniversary of the conservationist's death.

Talking about what makes local food systems work

As the Center becomes more involved in exploring the dynamics of food systems and encouraging use of locally grown foods, Gary Valen's success story at Hendrix College offers a good example of how to link institutions and producers.

At the behest of the Leopold Center, Valen spoke at ISU's Scheman Building on April 8 about "Institutional Buying of Locally-produced Foods: The Hendrix College Experience." An audience of about 50 people heard the former dean of students at Hendrix College (Arkansas) describe how he spearheaded a project which increased local food purchases by the college food service from 7 to 30 percent over a four-year period. In addition, several new farms were started and others expanded their operations. He estimates that this move to utilize local food sources redirected \$200,000 of the college's annual food budget back to the local economy.

Valen said that this kind of success requires careful planning and teamwork. He told the audience that you can't provide locally grown food year-round in some areas, and you can't supply every single food item from within your area, but you can make substantial inroads to encourage consumption of more locally grown commodities. Once consumers become aware of how far their food staples travel (and in some cases, exactly where the food comes from), pursuing locally grown items becomes much more appealing.

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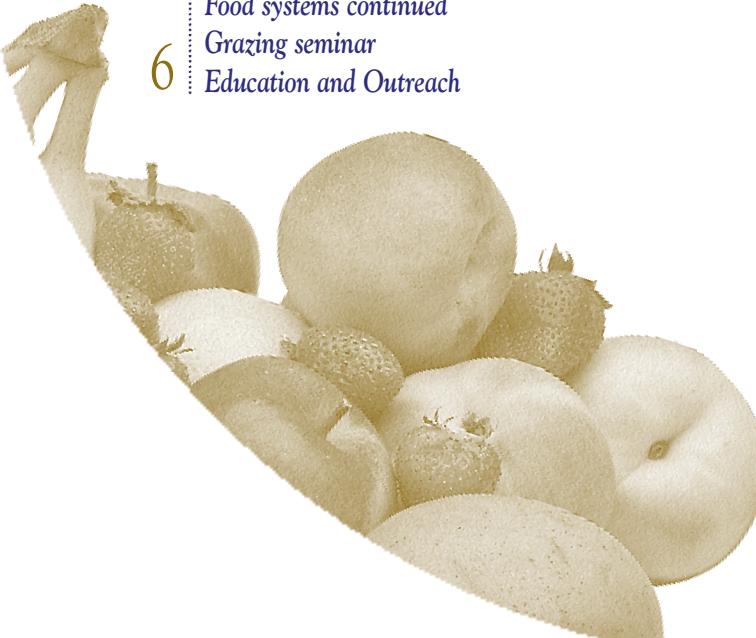
Gary Valen



EVENTS

6

*Food systems continued
Grazing seminar
Education and Outreach*



food systems continued... The process of bringing more locally grown items into the food service mix requires accommodation on both sides. Local growers need to organize among themselves and band together with a local broker to negotiate with institutional buyers who prefer to purchase bulk quantities from one source. Local producers also may need to increase their production to meet the seasonal demands of institutional food service operations.

Kamyar Enshayan, an adjunct professor of natural sciences at the University of Northern Iowa (UNI), told the same Scheman audience about the progress of a Leopold Center-funded project to identify food systems that will enable UNI and Allen Hospital to invest more of their food dollars in Iowa. Like Valen, he stressed the importance of relationship building among food service directors, buyers and growers, and consumers in creating a viable local food system.

Following up on local food systems

At a May 13 follow-up meeting at ISU's Scheman Building, 17 people with an interest in revitalizing the local food economy came together to discuss what could be done regionally and statewide to promote institutional buying of Iowa-grown foods. The participants identified key issues and models for institutional purchasers and considered a possible framework for communication and development of cooperative projects. They also agreed to try to find foundations and organizations with funding for these initiatives.

Chris Palar, ISU Center food service manager, spoke about his staff's enthusiasm for developing locally grown menu options for their conference customers. Their interest stems from their involvement in serving locally grown foods at the Leopold Center's tenth anniversary conference in July 1997, as well as from the Center-sponsored Iowa Local Food Systems conference held in December 1997. The Ames-based Field to Family project (an FY 1998 competitive grant recipient) plans to link more growers with Palar as the Scheman food service expands its local food options.

Grazing topics highlight 1998 Sustainable Agriculture seminar

"**T**echnologies to advance the sustainability of Iowa's grasslands: Special topics for advanced graziers" was the theme for the 1998 sustainable agriculture seminar series at ISU. Because of the production-oriented nature of the course, both students and livestock producers were encouraged to attend. The Center worked with Extension livestock field specialists to locate appropriate viewing sites and promote attendance.

Eleven sessions, including two field labs, were conducted by ISU faculty and Extension personnel, as well as speakers from the Universities of Missouri and Nebraska, and Purdue University, as well as the National Cattlemen's Beef Association. Among the topics discussed were: year-round grazing, management-intensive grazing, forage species selections, use of stock-piled forages, and ways to measure increases in profitability and productivity from improved grazing management.

The grazing sessions comprised the fourth seminar series sponsored by the Leopold Center and the ISU department of animal science. This marked the second year that the educational opportunity was offered in cooperation with Professional Agriculture Off-campus Programs in ISU's College of Agriculture. The series originated from the college's Brenton Center in Curtiss Hall and was broadcast to a dozen viewing sites statewide.

ISU animal scientist Dan Morrical, who assisted long-time coordinator Jim Russell, explained the goals for this year's series: "We tried to focus on new technologies and the big picture that will be of benefit to established graziers or people with more experience. This seminar was intended to complement symposiums, pasture walks, and other events that are geared toward beginning graziers." The seminar's goals meshed nicely with several Center-funded research and demonstration projects featuring pasture walks, rotational grazing, and intensive forage management.

CONFERENCES

Education and Outreach Activities

Regional conferences

For a fifth year, the Leopold Center used its conference grant program and other funds to sponsor and provide input to educators interested in providing exposure for sustainable agriculture topics and practices. More than 1,300 farmers, educators, and community leaders were reached through 19 conferences, workshops, and tours held in 14 different towns and cities throughout the state. Programs were offered on organic agriculture, prairie establishment, grazing systems, riparian management, local food systems and community-supported agriculture, apple production and pest management, and alternative production systems for swine. Specific educational outcomes for Iowans included farmers learning about hooped house production technologies for raising swine and educators learning how to design and install buffer systems on the landscapes.

The Center joined with ISU Extension staff to organize the July 24, 1997 public tour of the ongoing shelterbelt projects near Ogden. They worked with Carl Mize, ISU forester and principal investigator for two Leopold-Center funded research efforts on the interactions within a shelterbelt ecosystem and the performance of different cropping systems grown under the influence of a shelterbelt.

A bus tour of alternative swine production facilities in northwest Iowa was held on November 25, 1997. Sixty-five participants saw hooped hog

structures at ISU's Allee Research Farm near Newell and viewed different bedding and housing systems at the Dan and Colin Wilson farm near Paullina. The tour was sponsored by ISU Extension Sustainable Agriculture Program, the Center, and Practical Farmers of Iowa.

Several of the Center's research and demonstration competitive grants and issue teams at various locations in the state sponsored tours of sites including animal manure/yard waste composting, pasture walks, and manure and riparian management.



YOW winds down and spins off

The successful 1997 Year of Water (YOW) celebration ended with a November conference (Iowa's Water Quality: Shaping Our Future Together) that the Center cosponsored with the Iowa Environmental Council (IEC). A highlight of this event was the release of the water quality plan that was developed through a series of focus groups and discussion sessions held throughout the state which involved numerous stakeholders.

Program coordinator Eldon Weber was able to continue maintaining the YOW web page for the remainder of calendar year 1998 with monies from some of the 71 affiliated YOW organizations. The Center recognized Weber for his outstanding contributions to YOW at the April 21 program honoring Aldo Leopold.

As a result of requests received at Iowa State University's College of Agriculture State Fair exhibit on water quality in the state, Anne Larson, communications specialist, worked with ISU Media Graphics to adapt a computer software program (in both Mac and PC versions) to acquaint users with Iowa's water resources. A handsome map of Iowa's waterways used at the State Fair exhibit is also available from ISU Extension, with Center assistance.



NEW MELLERAY FIELD DAY

1997-1998



LEOPOLD CENTER-SPONSORED REGIONAL CONFERENCES & WORKSHOPS

Anamosa

- Alternative System Swine Workshops

Ames

- Alternative Streambank Stabilization Practices
- Iowa Local Food Systems Conference
- Riparian Management Systems Workshop
- Watershed Partnerships: Protecting Our Water Resources

Davenport

- Crop Management Conference

Des Moines

- Iowa's Water Quality: Shaping the Future Together
- New Directions for Sustainable Management of Apples

Emmetsburg

- Managed Intensive Grazing Conference/Field Demo

Greenfield

- Grassroots of Grazing Meetings and ICN Marketing
- Neely-Kinyon Research Farm Annual Meeting

Indianola

- Grassroots of Grazing Meetings and ICN Marketing

Madrid

- Youth and Family Sustainable Ag Camp

Marshalltown

- Holistic Management

Moville

- Managed Intensive Grazing Conference/Field Demo

Oskaloosa

- Alternative System Swine Workshops

Protivin

- Prairie Pastures/Rotational Grazing Systems

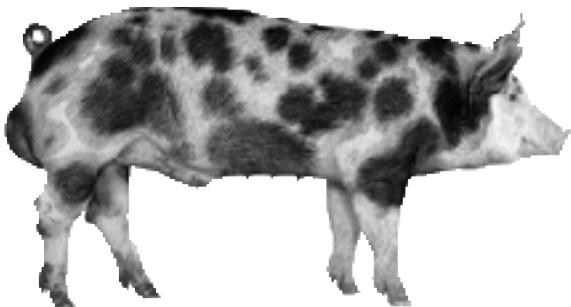
Vinton

- Sustainable Agriculture Showcase

Winterset

- Grassroots of Grazing Meetings and ICN Marketing

"Theoretically, the mechanization of farming ought to cut the farmer's chains, but whether it really does is debatable."
Aldo Leopold



EVENTS

Education and Outreach continued

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Continuing work with communities and conservationists

The Non-Farmers Guide to Agriculture entered its third year of Leopold Center sponsorship with a name change to "Community Guide to Agriculture." Project organizers planned to include a watershed focus in 1998-99, with the Clear Creek watershed in Johnson County targeted because of the mix of farm and urban stakeholders. Project coordinator Wayne Petersen partnered with Kent Newman of the Wallace House Foundation in using an approach of seeking common ground to help build stakeholder relationships within the watershed. As part of this project, the Center participated in an April 9, 1998 agriculture and natural resources expo for over 150 Johnson County science, biology, and math teachers.

The Master Conservationist Program, with over 25 people registered in 1997, was offered again in Story County in June and July 1998. This grass roots-developed conservation program also exposes landowners interested in conservation to sustainable agriculture and food system principles. Participants must give a set number of hours back to the community on an environmental, conservation, or sustainable agriculture project.

In January, 1998 the Center coordinated and facilitated a discussion between the researchers in the "hoop group" (Mark Honeyman, Jay Harmon, Don Lay, Tom Richard, and Jim Kliebenstein), 13 Iowa farmers who have experience with hoop houses, and several ISU Extension swine field specialists. They discussed whether the proposed research is on target, and offered some guidance for the need to a follow-up to the successful 1996 swine systems options conference. A statewide conference on swine systems alternatives is planned for February, 1999.

Leadership and training

Education coordinator Rich Pirog was part of the Iowa Environmental Leadership Institute (ELI) Committee in 1997-98. ELI's primary objective is to encourage environmental educators to realize their potential as leaders, and to help promote effective communication among environmental educators and with the public.

The Leopold Center and John Deere provided start-up funding for ELI to lay the groundwork for an environmental and conservation calendar of events World Wide Web site, which will be administered by the Iowa Conservation Education Council. The web site is slated to be operational by January 1999.

Pirog and Mike Duffy continued to be involved in sustainable agriculture training of ISU Extension and USDA Farm Service Agency staff, with sessions held in January and February, 1998. Pirog also gave presentations about the Center and about Aldo Leopold to groups in Ames, Des Moines, Marshalltown, and Iowa City.

The Leopold Center continued its summer intern in sustainable agriculture program in 1997 (fifth year) with the hiring of Eric Brevik, an agronomy graduate student, who helped coordinate the tenth Anniversary conference tours. Jenifer Sechrist served as intern in the summer of 1998 and helped summarize regional conference evaluations.

Competitive grants

COMPETITIVE

Considerable amounts of the Leopold Center's time, money, and energy go to support the competitive grant research and demonstration program. Staff and advisory board members are involved in the selection of the year's proposal topic areas, the preparation of the year's RFP (request for proposals), to the careful scrutiny of the proposals, the requests issued for submission of full proposals, and the final decisions on what projects will receive funding. The eventual findings of the many researchers whose projects the Center has funded will help change the face of Iowa's agriculture.

At the end of FY 1998, the Center had offered start-up funding to 22 projects for the coming year and renewed 23 projects for a second or third year of operations. Another 20 projects were scheduled to conclude their activities by June 30, 1998, and provide final results to the Center later in 1998.



AGRICULTURE AND COMMUNITY

Alternative and Horticulture Crop Education and Marketing Pilot Project

Ken Pangburn, Adams Community Economic Development Corporation, Corning • 3 years

NEW Area farmers explore development of a cooperative infrastructure to produce, market, and sell specialty and value-added horticultural and agricultural products.

Assessing the Impact of Instructors and Students as Transfer Agents

Eldon Weber, ISU Agricultural Education and Studies • 1 year

NEW Student and instructor surveys will be used to assess the effectiveness of the 1997 FFA On-farm Nitrogen Management Curriculum in promoting changes in producer practices for on-farm N management.

Community and Economic Regeneration through Strengthening the Local Food Economy

Kamyar Enshayan, Center for Energy and Environmental Education, Cedar Falls • 3 years

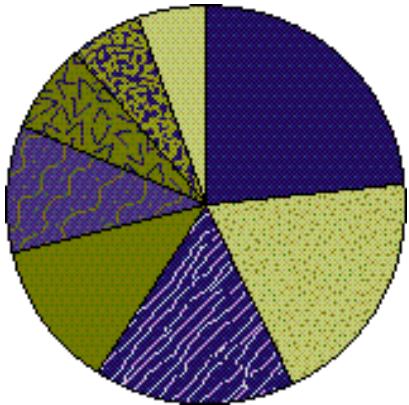
This project seeks to identify practical pathways that would enable institutional food buyers to feasibly invest their food dollars in Iowa and to support Iowa/regional farmers, processors, and distributors. In the first year of the project, organizers devoted their time to getting to know the people involved and building relationships among the various entities involved in institutional food purchases and preparation. They started to collect data about food expenditures, key processors, and potential suppliers for counties surrounding the Cedar Falls area and to trace the origins of the food currently used in local food service establishments.



GRANTS

Competitive

Where does the Leopold Center's competitive grant research funding go?



GRANTS

Competitive grants continued

10

The Leopold Center's legislative mandate calls for the Center to conduct research promoting sustainable farming systems and improved water quality, as well as educating the agricultural community about these findings. The preservation of farming systems and water quality is a critical consideration for all funded research, as is the education/outreach component. To provide more detail on the specific kinds of research funded under these umbrella topics, we have identified key subject areas and used them to offer one perspective of research spending from 1993 to 1997.

Note that for the past five years of the competitive grants program, roughly one-third of the Center's research dealt with animal/forage/ manure management and one-third with alternative pest management, while the remaining third covered a variety of other sustainable agriculture subjects.

%

23.5	Biological control and IPM
19.3	Livestock management and forages
16.9	Other sustainable agriculture topics
12.0	Nutrient management
10.2	Weed management
7.4	Agroecology
5.8	Water quality monitoring
5.4	Swine production and management

(based on competitive grants awarded 1993-1997)

Field to Family: A Community Food Project
Jan L. Flora, ISU Sociology • 1 year, ending 1998

Field to Family links ISU, local churches, social service organizations, businesses, and other community-minded groups to provide fresh food grown on local farms to families of all income levels. Low-income families especially are being encouraged to use fresh produce, take cooking classes, and attend nutritional and educational programs for their children. A Spring Festival at the beginning of the season and a Harvest Festival in October (which drew 250 people) are other events sponsored by the project.

Examining the Potential for Organic Apple Production—the Homestead Orchard Project
Steve Muller, The Homestead, Runnells • 3 years

NEW This project will establish a model for a commercial organic apple production system for residential facilities housing people with developmental disabilities and other special needs.

Rural Regeneration Through Direct Marketing Audubon County Meats
Donna Bauer, Audubon County Rural Action Committee, Audubon • 2 years

The overall goal of the project is rural regeneration through direct marketing of Audubon County Meats and other farm products. A portable display about the farmer members and a descriptive brochure were prepared to explain why this sort of marketing is important for family farms. Research was conducted using surveys distributed to customers at local farmers' markets. Cooperative marketing efforts were made with local businesses, organizations, and individuals, with plans to join with other direct marketing and Community Supported Agriculture groups for a possible booth at the 1998 Iowa State Fair.

NSERVATION IS

Rural-Urban Stewardship Project

Jill S. Knapp, Conservation Districts of Iowa,
Johnston • 1 year, ending 1998

After an initial lack of success with a more broad-based public program designed to increase awareness about agriculture, the organizers then offered sessions targeted at smaller, individual groups. They planned to present six three-hour programs for urban groups. The informational tours will be conducted on a working farm near Ankeny where livestock and cash crops are raised and land stewardship is practiced.

Youth and Conservation Methods

Don Groff, Woodbine Community School,
Woodbine • 1 year

NEW Woodbine fifth- and sixth-grade students will learn by doing as they visit local farms to interview farmers and videotape conservation and sustainable agriculture practices.

AGROECOLOGY

*Evaluation of Interactions within
a Shelterbelt Agroecosystem*
Carl W. Mize, ISU Forestry • 3 years

In continuing work with a computer model based on a shelterbelt near Ogden, this project is expanding its efforts to quantify the economic and environmental impact of shelterbelts on production of corn, soybeans, and oats. Positive effects from the shelterbelt are beginning to be seen on corn grain yields, while soybean yield seems to be less sensitive to the shelterbelt's presence. (A snow fence was added on the west side of the shelterbelt to compensate for the loss of lower branches on some of the poplar trees.) Wind speed sensors were installed to determine shelterbelt effects, and it appears that the shelterbelt has a significant effect, especially when the wind is from a westerly direction.

Evaluation of Three Cropping Systems

Grown Under the Influence of a Shelterbelt
Carl W. Mize, ISU Forestry • 3 years

This project is evaluating economic and biological benefits of applying hog manure to strip-intercropping, with applications to harvested oat strips, continuous corn, and a corn-soybean rotation grown under the shelterbelt's influence south of Ogden. Resulting data will be used to evaluate the shelterbelt agroforestry modeling system being developed by an interdisciplinary team of researchers at ISU and elsewhere. Because 1997 was the first year of the study, only final yield data on corn and soybeans were collected to establish benchmark data. This initial data showed little effect from the shelterbelt on yield, which was not surprising since 1997 was generally a good crop year when the shelterbelt influence was likely to be minimal.

CROP AND FORAGE SYSTEMS

*Determination of Early Summer
Pasture Conditions to Optimize Forage
and Calf Productivity and Profitability*
Jim Russell, ISU Animal Science • 3 years

This project is correlating soil properties, forage growth, and stocking rates at the beginning of spring grazing with forage yields, cow reproduction, calf weight gain, and profitability over the summer to help farmers determine the optimal conditions for initiating early spring grazing. To date, strong correlations have been found between seasonal forage production and initial pasture and environmental conditions, particularly soil phosphorus concentration. In evaluating the effects of corn crop residue grazing on soil properties, preliminary data show small differences in penetration resistance between measurements inside and outside of the grazing exclosures that were seemingly related to how early grazing was initiated.

*Development of Switchgrass as a Viable
Agricultural Commodity for Farmers in
Southern Iowa*

Jim Cooper, Chariton Valley
RC&D, Centerville • 3 years

Funding will aid development and delivery of information and education for the multi-county, multi-agency Chariton Valley Biomass Project. Active producer and community involvement has been encouraged through news reports and articles, distribution of 1,000 project fact sheets, a quarterly newsletter, project slide set, and web site. In addition, project-related presentations have been delivered to nearly 1,000 professionals with public agencies, representatives of private organizations, and land owners. Ten project field days, demonstrations, and meetings were conducted for more than 250 participants.



"Food chains are the living channels which conduct energy"



GRANTS

Competitive grants continued

12

"Food chains are the living channels which conduct energy"

Eastern Gamagrass Seed Dormancy
Allen Knapp, ISU Agronomy • 3 years

Eastern gamagrass, a highly productive, warm-season perennial that is palatable to cattle, is a potential forage crop for marginal land, but it is impractical for widespread use because it is very difficult to germinate. Initially researchers determined that culipe removal, combined with scarification of the pericarp over the embryo, resulted in nearly complete germination of viable seed. However mechanical scarification on the commercial scale is likely to damage the seeds, so the focus has turned to the value of treating seeds with plant hormones to induce germination. Ultimately a combination of chemical scarification and hormonal treatments may prove useful in treating dormancy problems in Eastern gamagrass.

Economic and Environmental Evaluation of Crop Management Systems for Sustainable Agriculture
William D. Batchelor, ISU Agricultural and Biosystems Engineering • 3 years

This work is investigating various levels of crop management: traditional practices, grid-based soil sampling and crop scouting, sampling and scouting assisted by global positioning systems (GPS) technology, and full precision crop management which maximizes use of GPS in an effort to help participating farmers determine the best combination of tools for their operations. On-farm demonstrations conducted on ten farms in Jones and Linn counties are being used to directly compare the economic return from each management practice in side-by-side field trials. Modeling techniques have been developed to describe yield variability for corn and soybeans. The corn model thus far adequately responds to nitrogen rates for Iowa soils and environmental conditions.

Establishing Production Plots for Local Ecotype Prairie Seed
Jerry Selby and Keith Fletcher, The Nature Conservancy, Des Moines • 4 years

NEW Through market analysis and on-farm production demonstrations, the investigators will assess the potential for local ecotype prairie seed as an alternative agricultural product for Iowa.

Establishment and Persistence of Legumes on Sites Varying in Aspect, Landscape Position, and Soil Type
Kenneth Moore, ISU Agronomy • 3 years

Because of the narrow species diversity in Iowa pastures, this work is investigating increasing the diversity of legume species and mixtures in pastures and assessing their impacts on forage quality and quantity at six sites at ISU's Rhodes Research Farm. Pasture growing conditions during 1997 were nearly ideal although some reseeding was done early in the year. Four grazing periods were used for rotational grazing treatments compared with three for 1996. Forage grazing samples for both years are ready for forage quality analysis. The legume proportion in pastures increased in 1997, but the legume composition was similar in both years.

Evaluating the Adaptability of Alternative Perennial Legumes
David Haden, ISU Northwest Research and Demonstration Farm, Sutherland • 3 years

NEW Stands of Kura clover, cicer milkvetch, and rhizomatous birdsfoot trefoil will be established on ISU research farms across the state for evaluation of regional adaption, longevity, and forage traits.

Evaluation of the Effects of Fiber Concentration and Protein Degradation Characteristics of Berseem Clover Silage on the Performance of Growing Beef Cattle
James Russell, ISU Animal Science • 1 year, ending 1998

Weather and soil conditions at ISU's Rhodes Research Farm made establishment of berseem stands difficult, and investigators were forced to drop the cattle feeding/growth portion of the project. This experience and others indicate that success in growing berseem clover is highly dependent on climatic conditions. This high level of risk may mean that berseem clover may not be the alternative crop of choice in Iowa. Because of this limitation, the investigators initiated an experiment evaluating the nutritional properties of kura clover grown as a perennial legume (not requiring replanting) in a rotation with corn and used as a stockpiled forage for winter grazing.

Evaluation of Forage Plants Collected from Permanent Pastures Throughout Iowa
E. Charles Brummer, ISU Agronomy • 2 years

To improve producer pasture recommendations, this work will document genetic variation for traits important to persistence and survival in white clover, orchardgrass, and birdsfoot trefoil species that were collected from 20 permanent pastures around Iowa in 1996. The collected germplasm is now being evaluated in a replicated nursery at ISU for traits such as disease resistance, seed production, forage yield, and other qualities. Seed produced from this material will form a population for further selection work at multiple locations around the state.

Feasibility of Organic Soybean Production Following Conservation Reserve Program (CRP) Land
Kathleen Delate, ISU Horticulture and Agronomy • 3 years

NEW By evaluating yield, pest status, soil health indicators, and economics of conventional and organic soybeans on CRP ground, the project will document biological and economic outcomes of the two systems and explore implications for management practices.

Improving Tree Establishment with Forage Crops
Carl Mize, ISU Forestry • 3 years

NEW The project will document tree survival and growth, crop productivity, and system economics for fast-growing and high-value hardwood seedlings under weed control treatments that include small grain/forage crop combinations, herbicides, cultivation, and mowing.

Incorporating Native Plant Communities on Farms for Forage and Wildlife
Laura Jackson, University of Northern Iowa Biology • 3 years, ending 1998

The project is establishing native pasture plants in existing cool-season rotational pastures on three northeast Iowa farms. Investigators are evaluating seasonal forage production and nutrition, monitoring survival of native and non-native pasture species, and continuing to develop the three-acre prairie, savanna, and wetland refuge/wildlife area for future grazing studies.



Organic Farming Demonstrations

Project—Eastern Iowa

Warren Johnson, Limestone Bluffs RC&D • 3 years

NEW This project will establish demonstration sites at the Andrew Jackson Demonstration Farm in Jackson County and New Melleray Abbey in Dubuque County. The Andrew Jackson site will focus on transition issues for organic annual and perennial herb production, and will demonstrate techniques such as raised beds, crop rotations, and green manures. The Abbey work will center on flame cultivation for weed control and use of composts as soil amendment and fertilizer.

Small Grain and Annual Forage Legume Intercrops for Iowa
Jim Holland, ISU Agronomy • 2 years

Five small grain and five annual forage cultivars are being grown alone and in combination to determine the most promising mix of annual production rotations, best management practices, and changes in morphological and growth characteristics under different management regimes. During the first year, investigators measured forage yields, grain yields, grain test weights, and straw yields on each plot. Plant heights were measured at three stages in the growing season at the plots in Nashua and Ames. Total yield of plots harvested for forage increased significantly after a small grain companion crop was added to a forage legume crop at both locations. Total biomass also increased when small grains were added to legumes and harvested for grain and straw.



GRANTS

Competitive grants continued

14

LIVESTOCK MANAGEMENT

American Bison as an Alternative

Livestock Enterprise in Iowa

Elton Tophoj, Monona County Extension • 2 years

NEW

The project will examine bison production in Iowa, including issues such as production costs, handling, market opportunities, and market access.

Chariton Valley Beef Industry Initiative

Joe Sellers, Lucas County Extension • 3 years

NEW

Beef producers in the Rathbun Lake region will have the opportunity to develop operational plans that assess individual production, management, and marketing needs.

Coupling Swine Technologies:

Pig Production Systems for Iowa

Mark Honeyman, ISU Outlying Research Centers • 3 years

To demonstrate alternative approaches for raising swine in Iowa, farmer cooperators are coordinating with outlying research farms to study outdoor pig production options, combinations of technologies, and economics of these systems. Thus far, results indicate that hooped structures work well for gestating sows; a variety of floor plans is possible. Segregated early weaning of pasture farrowed pigs has been shown to be successful. A deep-bedded Swedish system to produce feeder pigs has worked well, as has group lactation. Researchers continue to work on management details of wean-to-finish and farrow-to-finish in hoops.

Growing Dairy Heifers in Southwest Iowa

Ron Sanson, Page County Extension • 3 years

NEW

ISU Extension and local producers and lenders will cooperate in collecting and analyzing economic and production data that can be used to refine management practices and assess the potential for expansion of dairy calf production in southwest Iowa.

Investigation into the Use of Botanicals as Part of an Integrated Value-added Pork Production System

Eric Franzenburg, Benton Development Group, Van Horne • 1 year, ending 1998

Selected herbs are known to naturally possess antibacterial and other characteristics that could be useful in animal protein production, possibly even addressing concerns about development of antibiotic-resistant bacteria. This project evaluated four herbs (garlic, Echinacea, goldenseal, and peppermint) that can be grown easily in Iowa and are unaffected by many common agronomic pests. If herbs can be used to promote growth rate and feed efficiency in feeder swine, there would be reductions in usage of synthetic growth promotants.

Iowa Lakes Controlled Grazing Project

Dennis DeWitt, ISU Extension • extended project, ending 1998

A group of concerned cattle and sheep producers in Emmet, Palo Alto, Dickinson, and Clay Counties has joined with local agencies to demonstrate that alternative grazing techniques with profit potential for producers would also benefit their local communities. Initially, seven beef producers worked with the ILCG to collect information on their present grazing practices while implementing improved practices. An additional cooperator, Iowa Lakes Community College farm, offered student involvement in the project. Besides sharing their results with others, project leaders hope to facilitate long-term leadership to continue the controlled grazing efforts beyond the end of the project.



EVOLUTION

*of a land ethic is
an intellectual as well
as emotional process.”* -Aldo Leopold

Stability and Activity of Antibiotics in Animal Manures

Walter Heid, ISU Veterinary Diagnostic Laboratory • 3 years

In the first stage of work, researchers developed analytical procedures for extraction of certain antibiotics and their residuals from swine manures; in the second stage these procedures will be applied to treated waste products to determine the efficacy of different waste treatment methods in reducing antibiotics and their residuals.

NUTRIENT MANAGEMENT

Dairy Manure Quantification and Characterization in Grazing Systems

Wendy Powers and Marjorie Faust, ISU Animal Science • 2 years

NEW Milk production, pasture clippings, and manure are among the measures that will be used to generate manure composition and quantity prediction equations that will help intensive dairy grazers make decisions about environmentally sound stocking rates and manure storage management.

Development of Guidelines for Swine Manure Application in Corn for N-Management

Alfred Blackmer, ISU Agronomy • 3 years, ending 1998

Using late-spring soil nitrate tests, end-of-season cornstalk tests, and more than 100 on-farm trials from across Iowa, this project continues work to generate guidelines for site-specific use of swine manure as corn fertilizer. New sites were identified, tested using late-spring soil nitrate tests, and treated with replicated N treatments. Grain yields and end-of-season cornstalk nitrate were measured on all plots. This additional information will be used to further refine the late spring soil test for managing N in manured soils.

Development of a Nutrient Balance for Iowa for Evaluating and Targeting Sustainable Agriculture and Nonpoint Source Control Programs

George Hallberg, (formerly) University of Iowa Hygienic Laboratory • grant closed 1998

National Agricultural Statistics Service (NASS) farm input data from 1930 on were compiled, including crop acreage and production statistics, livestock statistics, and fertilizer usage. Analysis of this data would have allowed researchers to generate a historical analysis and perspective on the evolution of farming systems in Iowa and to illustrate the complexity of nutrient management problems. The Center plans to set up a special project that will use these preliminary statistics to provide nitrogen input/output budget for Iowa and to supplement ongoing Midwest hypoxia modeling efforts.

Education-based Incentive Program to Enhance Long-term Adoption of Sustainable Nutrient and Pest Management—A Demonstration with Farmers in Northeast Iowa

Gerald Miller, ISU Agronomy • 3 years

By equipping producers, particularly early career farmers, with expertise in soil map reading, soil testing, setting realistic yield goals, and other skills, this project hopes to provide a model for farmers to consistently apply techniques they have learned. During their first year in the program, producers write and implement nutrient/manure management plans for their farms and prepare end-of-year field and economic records. Participants move through the program in a series of workshops with a group of eight to ten others and receive incentive payments for elements of planning completed. Organizers continue to fine-tune the workshops to make them more appealing to participants. A biweekly NPM newsletter assists producers with field scouting and timely field/pest management decisions.

Environmental Impacts of the Use of Poultry Manure for Agricultural Production Systems

Rameshwar Kanwar, ISU Agricultural and Biosystems Engineering • 3 years

NEW The project will monitor two application rates of poultry manure and commercial fertilizer N 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.

Evaluation of Organic Soil Amendments for Certified Organic Vegetable and Herb Production

Kathleen Delate, ISU Horticulture and Agronomy • 3 years

NEW After analysis for macronutrients, moisture, and C/N ratio, several kinds of compost will be applied to production systems. The composts will be compared on the basis of product yields, pest status, soil health indicators, product quality, and economics.

Nitrogen Conservation in Swine Manure Composting—Land Application Systems

Thomas Richard, ISU Agricultural and Biosystems Engineering; Thomas Loynachan, ISU Agronomy; and Cynthia Cambardella, USDA-ARS-NSTL, Ames • 2 years

NEW Through quantifying N transformations as swine manure is composted with corn stalks at varying ratios, and quantifying C and N mineralization when composts of different maturities are applied to soil, the study will provide information to help farmers develop compost products that synchronize nitrogen release and crop uptake and improve overall soil quality.

"Land, man is no mere soil; it is a FOUNTAIN *of energy*



GRANTS

Competitive grants continued

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Socio-technical and Environmental Dimensions of Swine Manure Management Decisions
Clare Hinrichs, ISU Sociology and Tom Richard, ISU Agricultural and Biosystems Engineering • 2 years

NEW Qualitative field interviews will be conducted to assess how farm operation characteristics and personal views on environment and technology influence swine producers' manure management decisions.

Statewide Manure Management Education Initiative
Gerald Miller, ISU Agronomy • 3 years

Under leadership from ISU Extension, the Leopold Center, Iowa Veterinary Medical Association, soil and water conservation districts, and the Iowa Independent Crop Consultants' Association, this project uses intensive workshops with individualized participant plans to encourage appropriate decision making about the utilization of manure nutrients. During the first two years a total of 231 workshops were held across the state reaching 1675 producers. Using a modified "fishbowl" format allowed increased interaction and discussion among instructors (various Extension field specialists) and participants. These workshops provided producers with the tools to develop field-by-field manure nutrient management plans for their farms. Follow-up surveys of producers four to six months later showed that the median value of the information and knowledge resulting from the workshop was \$16.50 per acre. Workshop results are on the Internet at <http://extension.agron.iastate.edu/manure/>.

PEST MANAGEMENT

(includes biological control, diseases, insects, and weeds)

Biological control

Biological Control and Sustainable Horticulture Principles for Iowa's Vocational Agriculture Curriculum
Gail Nonnecke, ISU Horticulture • 2 years

A set of instructional materials on biological control and sustainable horticultural principles, the first of its kind in Iowa, is being developed by the investigators with assistance from Iowa high school teachers and students. A focus group provided direction for preparing the proposed 14 units/modules of the curriculum which will include active learning opportunities. Further evaluations of the curriculum followed, including an April 1998 ICN session with participating agricultural education instructors. The materials, available in both printed and electronic formats, will be provided to Iowa agricultural teachers at in-service sessions during summer 1999.

Biologically Intensive Pest Management: Iowa Apple Growers Take the Next Step Toward Sustainability
Mark Gleason, ISU Plant Pathology • 3 years

Up to 20 apple growers will become participants in cooperative trials to identify biologically intensive pest control tactics best suited to Iowa conditions. Research efforts are focused on apple scab, codling moth, and the sooty blotch/flyspeck complex. Thirteen new apple cultivars that are genetically immune to apple scab are being evaluated for yield and fruit quality. Insect growth regulators (IGRs) that cause codling moths to (fatally) molt at the wrong time are being substituted for conventional insecticides as a control method. A simple five-minute bleach dip after harvest may help alleviate the blemishes caused by sooty blotch/flyspeck.

flowing through a circuit of soils, plants, and animals.”

-Aldo Leopold

diseases. Weather-based warning systems are also being tested as a means of limiting the number of fungicide applications needed to halt the blemishing diseases.

Manipulation of Predatory Insects for Enhanced Biological Control of Insect Pests

John Obrycki, ISU Entomology • 2 years

One impediment to manipulating predators for biological control is that scientists do not understand the chemical cues and behaviors used by predatory species to locate their prey. This project aims to identify some of these chemical signals and characterize the behaviors used by predatory lacewings and adult lady beetles. Researchers have discovered several behaviorally active substances. Field trapping studies will be used to optimize the levels of attraction and arrested insect behavior. Compounds used by related predatory species in other countries will be examined for their effects on selected Iowa predators.

Transferring Biological Control Technology to Iowa Strawberry Growers

Donald Lewis, ISU Entomology • 3 years, ending 1998

The project investigated field effectiveness and economics of a number of biocontrol technologies for strawberries, including a biocontrol fungus that attacks the tarnished plant bug, fungi that suppress gray mold growth, and corn gluten meal as an inhibitor of weed germination. The biocontrol fungus (*Beauveria bassiana*) tested for control of tarnished plant bug was shifted from research farm plots to growers' fields. By moving the trials, plot size can be increased and the distance between treatments can be increased to keep insects from migrating easily from one plot to another. Data collection and analysis for other treatments continued.

Diseases

*Biocontrol of Sclerotinia Stem Rot in Soybeans with *S. sclerotivorum**

Charlie A. Martinson, ISU Plant Pathology • 3 years, ending 1998

Because certain soil-conserving practices encourage the disease potential of the white mold *Ungus S. sclerotivorum*, this project is investigating the use of biocontrol fungal parasites, such as *Sporidesmium sclerotivorum*, to control soybean stem rot in narrow row and minimum tillage operations. The mycoparasite is applied after harvest to fields affected by the disease to allow the mycoparasite to kill the sclerotia of the soybean stem rot pathogen before the next crop of soybeans is planted. Additional farmers' fields were infested with the antagonist in 1997. The search continued for a strain of the mycoparasite that may be a better parasite of sclerotia than the USDA strains of *S. sclerotivorum*. Experiments were conducted to determine if there were other procedures with residue handling, inoculum exposure, and environment (moisture and temperature) that may provide for better biological control, and soil factors that may limit activity of the parasite.

Identification and Characterization of the Rose Rosette Disease Causal Agent

John H. Hill, ISU Plant Pathology • 1 year, ending 1998

This project sought to identify and characterize the causal agent of the rose rosette disease (RRD) of multiflora rose. Knowing more about the causal agent could assist in safe use of RRD as a biological control agent on uncultivated land. Through molecular exploration, the investigators identified disease-specific proteins that can be used to generate antibodies specific to rose rosette. Knowing the sequence of these disease-specific proteins would allow creation of techniques that could be used to screen hybrid rose and rootstock for rose rosette disease.



Integrating Biologically Rational Strategies for Control of Anthracnose Fruit Rot of Strawberries

Mark Gleason, ISU Plant Pathology • 3 years

NEW

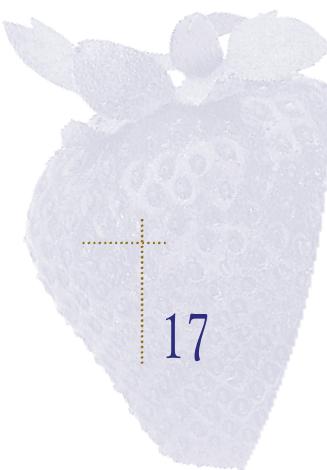
Analysis of performance and economics of a number of biological and cultural tactics will lead to recommendations for biological and cultural strategies to control this emerging disease of June-bearing and day-neutral strawberries.

Insects

Biological Control of Purple Loosestrife by Two Host-Specific European Leaf Feeding Beetles in Iowa Wetlands

John Obrycki, ISU Entomology • 3 years

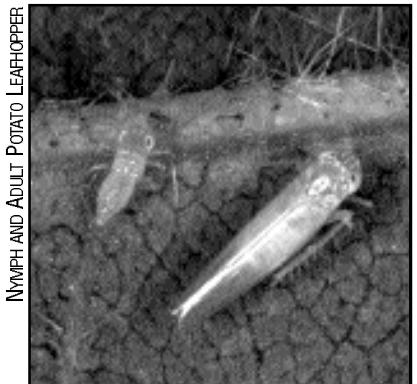
This project is investigating two beetle species that feed specifically on purple loosestrife plants, reducing loosestrife's ability to compete with desirable native plant species. In 1997, approximately 110,000 adult *Galerucella* spp. beetles were released across ten Iowa sites. The beetles survived the winter at all sites. Researchers will continue to rear and release them at new sites in 1998. Private citizens in Storm Lake have helped with beetle-rearing efforts in their area. Upper Iowa University cooperators have been rearing and releasing *Galerucella* along the Mississippi River with technical assistance from this Leopold Center project.



was actively developed before

ECOLOG

"Scientific Agriculture



NYMPH AND ADULT POTATO LEAFHOPPER

GRANTS

Competitive grants continued

18



Development of Alternative Carriers for Use of Beauveria bassiana in Ostrinia nubilalis Suppression on Corn

Les Lewis, USDA-ARS-Corn Insects and Crop Genetics Research Unit, Ames • 2 years

NEW

Investigations will be conducted at seven private farm sites to evaluate clay, corn cob grits, starch substrate plus corn kernels, and corn kernels as carriers for *B. bassiana*, which previously has been proven effective in managing European corn borer activity in corn.

Integrated Pest Management for Wireworms

Larry Pedigo, ISU Entomology • 3 years, ending 1998

The wireworm risk model was expanded by using digital maps of Iowa soil characteristics and compiling daily weather data for each Iowa county. The resulting computer model can be used to provide statewide wireworm risk information that will be disseminated via farm journals and ISU Extension publications. Cropping alternatives research continued at the three established locations. Stand count data were compared to 1995 and 1996 and differences evaluated to determine the impact of wireworms on corn and soybean stand development.

Manipulation of Predatory Insects for Enhanced Biological Control of Insect Pests

John Obrycki, ISU Entomology • 2 years

One impediment to manipulating predators for biological control is that scientists do not understand the chemical cues and behavior used by the predators to locate their prey. This project aims to identify some of these chemical signals and characterize such behaviors used by predatory lacewings and adult lady beetles. Researchers have established several behaviorally active substances for laboratory testing. Field trapping studies will be used to optimize the levels of attraction and arrested insect behavior. Compounds used by related predatory species in other countries will be examined for their effects on some Iowa predators.

Pheromone Mating Disruption: Novel, Non-toxic Control of the European Corn Borer

Thomas Baker, ISU Entomology • 2 years, ending 1998

By dispensing synthetic sources of European corn borer sex pheromones on grassy breeding areas, researchers have been making the male corn borers insensitive to the females' pheromones, thus reducing their rate of mating and consequent damage to corn crops. During the second season, investigators tested a new non-aerosol MSTRS™ device for emission characteristics and efficiency of disruption. One new version of the MSTRS™ technology used a pump-atomizer system programmed to discharge every 30 minutes (rather than every 15 minutes), thus nearly doubling the field life of the initial pheromone in the reservoir. Use of this new system has for the first time resulted in a demonstrated reduction in mating of 30-40 percent by free-flying, wild corn borer females. In addition, for the second year a nearly 100 percent disruption of pheromone source location by wild males was achieved.

Use of Intra-field Alfalfa Trap Cropping for Management of the Potato Leafhopper

John Obrycki, ISU Entomology • 3 years

Originating from farmer observations and practices, this project is researching the use of an alfalfa trap crop for potato leaf hopper management. By quantifying interactions among the trap crop, the life cycle of the leafhopper, and a fungal disease of the leafhopper, the project will assess effectiveness of intra-field alfalfa trap crop management at three locations. In the first year, potato leafhopper populations were higher in uncut alfalfa strips than in adjacent regrowth areas for two to three weeks after harvest. There were no differences in the number or type of insect predators found in the uncut and cut areas of alfalfa. Some of these predatory species prey on the potato leafhopper. Greenhouse predation studies showed that two predatory species consume immature and adult potato leafhoppers.

Y was BORN.

-Aldo Leopold

Weeds

Biologically Intensive Manipulation of Foxtail Soil Seed Banks for Enhanced Mortality
Jack Dekker, ISU Agronomy • 3 years

NEW By determining the emergence, mortality and long-term carryover of giant foxtail in soil seed banks, and how these fates vary over time by biotype, location, and burial depth, the project seeks to enhance seed death and provide practical weed seed bank management tools.

Evaluation of the Impact of Tillage/Cropping on Soil Microflora and Weed Seedbank Predation
Micheal Owen, ISU Agronomy • 3 years, ending 1998

Work continued on former eight-year Conservation Reserve Program (CRP) land at the McNay research farm near Chariton to assess the impact of tillage and cropping systems on the weed seed bank, including the influence of soil microorganism populations and changes in soil microflora resulting from CRP. Soil weed seed extraction was carried out on a large number of soil samples. Laboratory plating for identification and enumeration of microbes (fungi) was conducted. Soil samples from CRP plots across the state were collected for characterization of weed seed populations. This information will help monitor weed population changes as CRP land returns to production.

Managing Weeds by Integrating Smother Plants, Cover Crops, and Alternate Soil Management
Douglas Buhler and Keith Kohler, USDA-ARS-National Soil Tilth Laboratory, Ames • 3 years

NEW To broaden the scope and diversity of weed management in corn and soybeans, this project will investigate integrating smother plant systems with methods that reduce weed populations prior to crop planting. This project continues work of an earlier grant, Spring-seeded Smother Plants for Weed Control in Corn and Soybean (see next project).

Spring-seeded Smother Plants for Weed Control in Corn and Soybean
Douglas Buhler, USDA-ARS/National Soil Tilth Laboratory • 3 years, ending 1998

This project used berseem clover, varieties of medic, a short-cycling brassica, corn, and soybeans to study the biological interactions among the crops, weeds, and smother plants that would determine their feasibility in a spring-seeded smother plant system. Experiments were conducted with corn, soybeans, and potential smother plants at Ames, Sioux Center, and Crawfordsville locations in 1997. Greenhouse experiments were also used to evaluate the effects of planting date and smother seed planting depth on smother plant emergence and early growth.

POLICY

Compensation of Farm Employees
William Edwards, ISU Economics • 1 year, ending 1998

This survey provided information for farm employers to use in hiring and compensating employees, and also offered potential employees some background on employment conditions in agriculture. Included in the study were data on wages, benefits, bonuses, and other compensation of full-time agricultural workers in Iowa. Different sizes and types of farm businesses were compared and estimations made for how factors such as age, longevity, experience, education, and gender affect the employment picture.

Determining the Benefits of Environmental Improvements in Agricultural Production and Their Sustainability : A Community-based Study of Iowa's Pork Industry
James Kliebenstein, ISU Economics • 2 years, ending 1998

Surveys and experimental auctions were used to assess the willingness of participants (pork producers, neighbors, rural community residents, and

non-local pork consumers) to pay for products produced in systems representing various environmental improvements or impacts. In the final stage, participants were also given information about methods or technologies that will lead to improved environmental qualities (i.e., reduced odor) and then asked to respond about the level of acceptability of these potential technologies.

SOIL QUALITY/HEALTH

Development and Implementation of Cost-Effective Fertilization and Tillage Practices for Improving Soil Quality in Corn-Soybean Rotations
Antonio Mallarino, ISU Agronomy • 3 years

The practices compared in 1997 for corn included P and K fertilizer placements (broadcast, deep-band, and starter) in some trials and fixed versus variable P fertilization in others. Results for this year showed that yields were 5 to 10 bu/acre less for no-till than for chisel-plow tillage when broadcast or starter fertilization was used. Use of deep-banded fertilization, especially K, reduced the yield disadvantage of no-till management. Large grain yield responses to P fertilization occurred only in low-testing soils. There were no major differences among P placements on grain yields at any site. Responses to deep-banded K occurred with all tillage systems, but particularly with no-till and ridge-till, even on some high-testing soils. Variable-rate P fertilization based on grid soil sampling increased corn yields only slightly (about 1.5 bu/acre), but did lessen lessen the amount of P fertilizer by 16 lb P₂O₅ / acre overall. The preliminary results indicate that that variable rate fertilization and deep banding of K could reduce considerably the amount of P and K fertilizers being applied by farmers and the subsequent risk of nutrient contamination.

GRANTS

Competitive grants continued

The Effects of Transgenic Soybeans and Associated Herbicide Treatment upon Soil-Surface Mesofauna
Larry Pedigo and Royce Bitzer,
ISU Entomology • 2 years

NEW By identifying and quantifying springtail species composition in transgenic and other soybeans with their corresponding weed management systems, the study will reveal the effects of these systems on mesofauna (minute insects) which are important to overall soil health.

Soil Quality, Yield Stability, and Economic Attributes of Alternative Crop Rotations
Doug Karlen, USDA-ARS National Soil Tilth Lab, Ames • 2 years

Soil samples were taken from research farm plots at Kanawha and Nashua, Iowa, and Lancaster, Wisconsin, in 1997. These soils are being analyzed at the National Soil Tilth Lab to quantify how different crop rotations have affected several physical, chemical, and biological indicators of soil quality. Long-term yield data will also be evaluated to determine how those management practices have affected yield stability and economic returns. The information obtained through the soil and economic analyses will be combined to compute various soil quality and sustainability indices.

WATER QUALITY

Constructed Wetlands to Reduce Agricultural Chemical Transport to Water Resources
Dean Lemke, Division of Soil Conservation, IDALS • extended project, ending 1998

In this three-phase project conducted over five years, researchers evaluated the use of constructed wetlands for treatment of subsurface drainage prior to release to groundwater through agricultural drainage wells (ADWs) and worked to develop design and operation criteria for these treatment wetlands. Although the project focused on ADW concerns, the information obtained can be used to address water quality issues related to subsurface drainage across the entire Corn Belt region.

Toxicity of Pesticides Adsorbed to Suspended Sediment to Larval Fish in the Cedar River
Robert C. Summerfelt, ISU Animal Ecology • 3 years

In this National Research Initiative-Leopold Center grant, investigators are describing physical and chemical characteristics, including pesticide residues, of sediment and water samples from the Cedar River; determining the toxicity of

river sediments and water to larval walleye; measuring adsorption and desorption on clays; and determining whether toxic pesticides adsorbed to clays are toxic to larval fish.

Researchers are conducting laboratory experiments that will partition sediment effects from sediment-pesticide interactions as factors affecting the survival of larval fishes, a critical life stage.

OTHER SUSTAINABLE AGRICULTURE TOPICS

Ecology and Restoration of Farmland Woods in Central Iowa
Donald Farrar and Cathy Mabry, ISU Botany • 3 years

The project will identify the species and the species/site associations that characterize high quality woodlands, and provide information that will assist landowners and other groups in woodland restoration. A 1997 inventory was conducted for woodland understory plant species and environmental variables associated with both relatively undisturbed and disturbed woodlands with emphasis on the comparison of grazed and ungrazed woodlands. This inventory provided data on species associated with both relatively undisturbed woods and species sensitive to cattle grazing as well as facts on occurrence of rare species. This information will help determine likely species for reestablishment through restoration programs.

Wildlife Use of Terraces in Iowa Rowcrop Fields
Louis Best, ISU Animal Ecology • 1 year, ending 1998

This study documented the abundance and species composition of birds and mammals using terraces in southwestern Iowa. Researchers recorded densities and success of bird nests in terraces, identified potential nest predators and evaluated predation patterns in terraces, identified which mammals caused damage to terraces and determined the extent of this damage, and evaluated the effects of terrace type, number of terrace rows, and terrace management practices.

Completed grants

COMPLETED

Thirteen research and education projects funded by the Leopold Center were completed in 1997. For more information, consult the 1998 Center Progress Report, or request a copy of the full project report from the Center office.

EDUCATION

Everything you wanted to know about wildlife and fisheries: A field day for agriculturists
James Pease, ISU Animal Ecology

GRAZING/FORAGE MANAGEMENT

Collection of forage crop germplasm throughout Iowa
Charles W. Brummer and Stephen K. Barnhart, ISU Agronomy

Demonstration of an annual forage crop integrated with crop and livestock enterprises
Richard Cruse, ISU Agronomy, and Mark Honeyman, ISU Research Farms

Education-demonstration for intensive grazing and forage management on highly erodible land
Brian Peterson, Natural Resources Conservation Service

Intensive rotational grazing management education-demonstration for Northeast Iowa dairy and beef producers
Tony Harvey, ISU Extension

Iowa Pasture Management Guide
Stephen K. Barnhart and Kenneth J. Moore, ISU Agronomy

LIVESTOCK MANAGEMENT

Demonstration of a Swedish sustainable swine production system in Iowa
Mark Honeyman, ISU Research Farms

Mahaska County livestock manure/crop nutrient management demonstration project
Joe Sellers, ISU Extension

SOIL AND WATER QUALITY

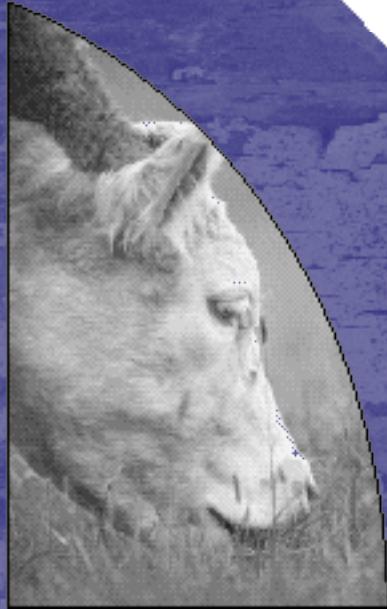
Animal manure/municipal yard waste composting project in Wright County, Iowa
Randy Killorn and Don Wetterauer, ISU Agronomy

Demonstration of an agroforestry system to minimize pollution hazards from land application of treated municipal sludge
Joe Colletti, Richard Schultz, and Carl Mize, ISU Forestry; Michael Thompson and Irv Anderson, ISU Agronomy

Enhancement of agricultural weed control by manipulation of the light environment
Thomas W. Jurik, ISU Botany

Fertilizer placement for ridge-till and no-till systems
Antonio P. Mallarino, ISU Agronomy

Impacts of swine manure application and alternative N-management practices on productivity, sustainability, and water quality
Rameshwar S. Kanwar, ISU Agricultural and Biosystems Engineering



GRANTS

Completed

21

ISSUE

Agroecology

Riparian research on track

The Leopold Center's Agroecology Issue Team, led by Richard Schultz of the ISU forestry department, reports that riparian forest buffers can trap over 80 percent of the sediment from surface runoff. Soil aggregation is dramatically improved under the buffer vegetation after only seven years of growth. This leads to improved infiltration and sequestering of nonpoint source pollutants.

Groundwater sampling shows evidence that nitrate can be reduced by up to 90 percent below the buffer. These reductions seem to stem from bacterial denitrification which is dependent on available carbon. Large seasonal changes in fine root growth and decomposition provide some of that carbon. Extensive work is being conducted to understand the dynamics of the organic carbon

fraction in the soil. Large amounts of organic matter not only improve denitrification rates but also can improve soil porosity.

Research is also continuing to define the length of time needed for a buffer to reach maximum efficiency. A major goal of this work is to provide guidelines for determining buffer width in specific landscapes.

The agroecology team now has sites ranging from zero to eight years of age available for study. By sampling at different ages, the team can determine the time needed for a riparian zone to regain some of its biological and physical functions following row crop agriculture and/or grazing.

Researchers comparing the responses at the Bear Creek sites to long-term grass filters, native forests, grazed pastures, and cultivated cropland in two adjacent watersheds have found that dramatic changes occur in the first eight years of buffer growth, but that the buffers still have not reached their maximum potential for reducing nonpoint source pollutants.

The issue team has been awarded a three-year Section 319 Water Quality Project grant (from the Iowa Department of Natural Resources - Environmental Protection Division/U.S.

Environmental Protection Agency). This award is to develop a series of wetlands to intercept a large agricultural drainage tile that drains about 700 acres of land. The grant will also be used to install a series of grade control structures in the creek to help stabilize the channel and reduce streambank erosion, and to develop additional technology transfer materials. The team has also received money from the U.S. Geological Survey to model the potential impact of large wetlands on water quality and flood events.

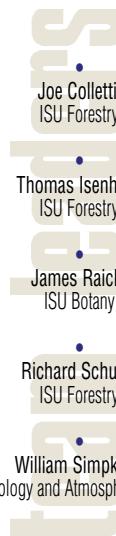
TESTING FOR H₂O QUALITY



TEAMS/INITIATIVES

Agroecology issue team

22



Joe Colletti,
ISU Forestry

Thomas Isenhart,
ISU Forestry

James Raich,
ISU Botany

Richard Schultz,
ISU Forestry

William Simpkins,
ISU Geology and Atmospheric Sciences

The team has met with four landowners along Bear Creek about establishing riparian buffers on their land and will probably double the buffered stream length in the next year. Presently there are about four miles of buffers which could be extended to eight miles by the end of 1999. This would significantly lengthen the Bear Creek Study area, already one of the longest riparian study sites in the nation.

Buffer Initiative begins

The agroecology issue team is a major partner in the Iowa Buffer Initiative (see story on page 27) as well as serving as the initiative's research arm. The five-year initiative will create 20 riparian buffer demonstrations a year around Iowa with the first set of demonstrations established in spring 1998. The team has been active in

STABILIZATION



designing these demonstrations and will monitor a subset of these sites to assess the effectiveness of riparian buffers in parts of the state outside of the Bear Creek watershed.

On June 16, 1998, the Bear Creek site was formally recognized as a National Demonstration Site by Secretary of Agriculture Dan Glickman and a permanent plaque was established at the site. The dedication was part of the Iowa Conservation Buffer Tour attended by over 100 persons from around the state.

Outreach

The team sponsored four educational workshops this year including two funded through the Center's conference workshop program (*) :

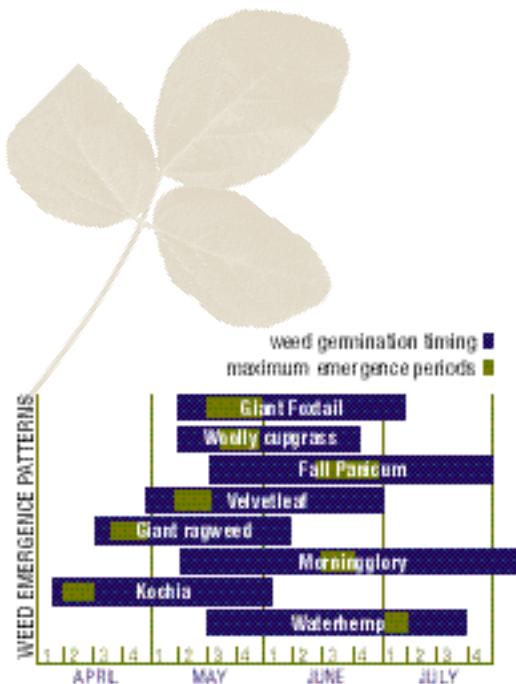
- a two-day riparian management workshop for professionals in government and non-profit organizations*,
- a three-day streambank stabilization workshop for NRCS engineers*,
- a one-day workshop for the Missouri Agroforestry Conference, and
- a half-day workshop at National Arbor Convention in Atlanta.

Team members have made over 60 presentations to public and private groups plus presentations at professional meetings during the past year. They also hosted more than 30 tours of the Bear Creek research and demonstration sites and published three buffer outreach documents with the National Agroforestry Center in Lincoln, Nebraska.

SOIL TESTING



Trying to influence weed management decisions



The Leopold Center's Weed Management Issue Team was formed in 1996 to study current weed management systems in production agriculture and identify specific areas that should be modified to improve sustainability. Funding for the team was focused on two major areas: weed emergence dynamics and growers' decision making. Members of the team represent all areas of agriculture including growers, seeds, agrochemicals, and service. (In addition, the Center has awarded 10 percent of its competitive grants funds to weed control alternatives research over the past five years.)

Survey

Initially the team wanted to find out how and why the producers make their weed management decisions. In the team's first year, Mike Owen directed a survey that asked over 1,000 producers about their attempts to manage weeds using herbicides, cultivation, crop rotation, and other

alternatives. The results showed that farmers were most likely to use herbicides as a management tool. Survey respondents did not use alternative weed management strategies frequently, and when they did use them, the alternatives were not seen as being as effective as herbicides. Clearly there is a role to be played by the team in increasing knowledge about weeds and encouraging producers to use an integrated strategy to deal with weed outbreaks. A follow-up to the survey will be done in fall 1998 with the help of a sociologist from the University of Wisconsin.

Emerging weeds

Farmers also need to know something beyond which weed species populate their fields. Critical information for the success of weed management strategies includes determining when and for how long specific weeds emerge and what percentage of seeds actually germinate. Bob Hartzler and Doug Buhler began studying four problem weeds (giant foxtail, woolly cupgrass, velvetleaf, and waterhemp) in 1995 and have since expanded the study to include 26 weed species. Thus far they have found broad differences among species in emergence timing and scope (see accompanying graph), which helps explain why weed management is such a complex task. The individual weed germination timing and maximum emergence patterns present real challenges that cannot be met with only one herbicide application.

Outreach

Members of the weed management team made presentations at the annual meetings of the North Central Weed Science Society and Weed Science Society of America reporting on details of the survey about weed control attitudes and actions. Information about the survey was shared internationally at the Brighton (British Crop Protection) Conference at Brighton, UK, and at an invited presentation at the University of Guelph, Canada. The team prepared a sustainable agriculture series fact sheet (SA-11) on "Relative emergence sequence for weeds of corn and soybeans" which is available from ISU Extension.

TEAMS/INITIATIVES

Weed management issue team
Hooped house initiative

24

team members

Weed scientists

- Robert Hartzler, ISU Agronomy (team leader)
- Douglas Buhler, National Soil Tilth Laboratory
- Jack Dekker, ISU Agronomy
- Mindy Hoffman, National Soil Tilth Laboratory
- Micheal D.K. Owen, ISU Agronomy
- Brent Pearce, ISU Agronomy

Associated biological scientists

- Tom Jurik, ISU Botany
- Keith Whigham, ISU Agronomy
- Dana Dinnes, National Soil Tilth Laboratory

Farmers

- Eric Hovey, Badger
- Eric Franzenburg, Van Horne
- Lee Miller, Waterloo

Agribusiness representatives

- Jim Penney, Heart of Iowa Cooperative
- Tom Smidt, independent crop consultant
- Steve Strachen, DuPont Agricultural Products

Agricultural economists

- Mike Duffy, ISU
- Bruce Babcock, ISU

Hooped house initiative begun

As low-cost hooped hog houses become an increasingly popular alternative to large-scale intensive hog confinement, questions arise about the relative efficiency of hoops versus the bigger confinement structures for farrowing and finishing. The Center began working with Mark Honeyman, head of ISU's research farm operations, and several other ISU faculty members to evaluate the long-term impacts of hooped houses on Iowa swine production.



The Center has provided \$50,000 for the first year of this initiative; the Iowa Pork Producers Association has also committed funds. Some of the Center's funding is being used for a side-by-side comparison of a confinement system and a hooped house. A modular confinement facility that can be easily modified for other uses and two hooped structures have been constructed at the Rhodes Research farm near Marshalltown. Observations of the pigs raised in the two systems over a five-year period will help answer specific questions about pig performance, water quality impacts, odor, and soil quality.

QUESTION

What is

a hooped
hog house?

ISU scientists involved in the hooped houses initiative include:

- Mark Honeyman, an animal scientist, who will consider pig nutrition, management, and production,
- Don Lay, an animal behaviorist, who will evaluate behavioral differences between swine raised in various systems,
- Tom Richard, agricultural and biosystems engineer, who will assess composting systems that use the manure bedding pack,
- Jay Harmon, agricultural and biosystems engineer, who will concentrate on developing specialized, customized hoop building designs for comfortable swine environment, and
- Jim Kliebenstein, an agricultural economist, who will study economic and revenue aspects of these research efforts in light of producers' experiences and observations about hoops.

At a January 1998 meeting sponsored and coordinated by the Center, swine producers, educators, and researchers acknowledged that they were dependent on each other to improve hooped system technology and implement changes. Producers are aware that they need to take charge of their operations to avoid additional regulation. Both university research expertise and everyday pig production common sense are necessary to devise more profitable and environmentally sound approaches to swine production. The Center's hooped house initiative will help bring these groups together.

A hoop consists of 4-foot high wooden sidewalls fitted with steel tubular arches covered by an opaque UV-resistant polypropylene tarp. Most of the floor area inside the hoop (pig living quarters) is bedded with cornstalks or other crop residues. The remaining floor is a concrete slab where feeders and waterers are located. The pigs are typically housed in groups ranging from 75 to 250 head. Each hoop holds one pen of pigs or occasionally the hoop is split lengthwise down the middle into pens.

HOOP HOUSES



Major differences between hoops and conventional confinement swine finishing facilities include use of bedding, management of manure, natural ventilation, large groups of pigs in one pen, more environmental variation, low initial investment, and only one or two groups (pens) of pigs per building. Bedding and manure handling are expected to be the largest energy expenses for the hoop structures. Hooped structures are also easily adapted to other uses such as storage.

Long-term Agroecology Research (LTAR) Initiative Funded

KATHLEEN DELATE (RIGHT) TAKES NOTES



The 1997 hiring of Kathleen Delate as ISU's first specialist in organic agriculture provided an excellent opportunity for the Center to further expand organic research in the state. Delate found that in this brand-new job, she needed help to support a serious research program. She turned to the Leopold Center for assistance and the Center has responded with start-up funds to allow her to begin her research efforts.

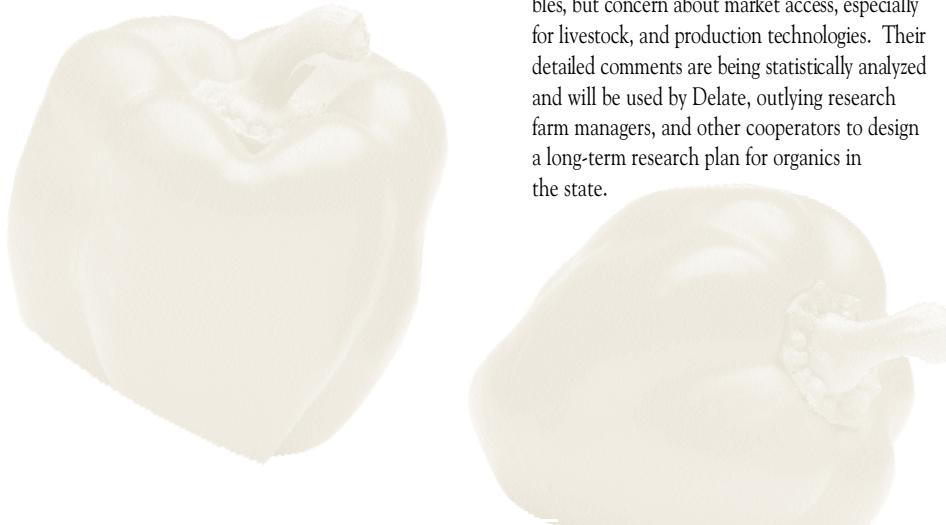
Delate's first task was to investigate the state of organic agriculture in Iowa. She and Jerry DeWitt, a long-time Leopold Center board member and ISU entomology faculty member, traveled to six sites (Jefferson, Castana, Lewis, Nashua, Crawfordsville, and Muscatine) to

The Leopold Center provided \$30,000 for the first year of the long-term research effort, some of which Delate used to hire a full-time technician. She has pulled together a group of experts from within and outside ISU to discuss and plan for ongoing research. Early work has begun with on-farm organic fertilizer trials in Kanawha, organic soybeans following CRP in Clinton, an organic vegetable/herb demonstration garden at Allee, and research plots in Greenfield, Muscatine, and Crawfordsville.

The first LTAR site has been established on 10 acres at the Neely-Kinyon ISU farm in Greenfield. Areas of research at the LTAR site include nutrient cycling, insect/weed/pathogen dynamics, plant competition and yield responses in organic vs. conventional agricultural systems. Delate has also received approval for funding through the competitive grant program for work on organic soil amendments, and soybeans after CRP. This grant work will complement the longer-term efforts of the organic initiative. She will also be cooperating with Warren Johnson of Limestone Bluffs RC&D to establish demonstration sites in eastern Iowa (see page 13).

gauge current needs in the area of organics. The focus group participants were overwhelmingly positive, but also cautious. There was optimism about markets for organic row crops and vegetables, but concern about market access, especially for livestock, and production technologies. Their detailed comments are being statistically analyzed and will be used by Delate, outlying research farm managers, and other cooperators to design a long-term research plan for organics in the state.

The Leopold Center is excited about the possibilities for instituting an organic research program in Iowa. Center Director Dennis Keeney says, "We view organic production as a great opportunity for Iowa farmers to expand their market base, provide value-added and value-retained production for Iowa's communities, and offer alternative, high-quality, healthy foods for Iowa markets. Also, our scientific knowledge of soil quality, pest interactions, and pest control will be enhanced as researchers tackle the difficult task of growing crops profitably without external chemicals."



BEAR CREEK

Bear Creek begets the Iowa Buffer Initiative

The Leopold Center's early financing of work by the Agroecology Issue Team has proved to be a true blue-chip investment. Led by Richard Schultz of the ISU forestry department, the team's riparian buffer strip project at Bear Creek in Story County is now recognized by the Natural Resources Conservation Service (NRCS) as one of the finest in the country. It has become the prototype for an ambitious national buffer strip program and has been designated by the USDA as National Demonstration Site.

The Bear Creek project will serve as a model for the Iowa Buffer Initiative, a \$1 million-plus effort to promote water quality through use of



KEENEY AND SCHULTZ AT BEAR CREEK DEDICATION

"...a land ethic changes the role of Homo sapiens from conqueror of the land-community to plain member and citizen of it. It implies respect for his fellow-members and also respect for the community as such."
-Aldo Leopold

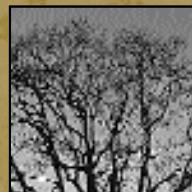
vegetative buffer strips along Iowa waterways. The Iowa Buffer Initiative, begun in early 1998, is being headed up by Iowa-based Trees Forever, with the help of sponsoring partners Novartis Crop Protection, the Iowa Farm Bureau Federation, Iowa Department of Natural Resources, the U.S. Environmental Protection Agency, the NRCS, and the Leopold Center. The Center will also continue to provide the Agroecology Issue Team with funds to expand its education/demonstration program.

The Iowa Buffer Initiative will create 20 riparian (river or stream) sites across Iowa annually for the next five years. The nationwide model will also establish technical assistance networks that will support landowners who want to install buffers, help position shelterbelts as buffers around livestock confinement operations, formally recognize landowners who preserve streams and waterways with grass/tree buffers, and use field days to increase awareness among farmers, landowners, and youth about the value of such buffers to sustainable agriculture.

Schultz says, "Ten scientists, nine landowners, ten resource professionals, and twelve graduate students are working on the Bear Creek project. Major credit also goes to Ron Risdal, who took a chance by letting this team transform his farm into a site that has now hosted visitors from across the United States and more than 30 nations."

What are buffer strips?

As developed by the Agroecology Team, the original riparian buffer strips consisted of zones of native grasses, shrubs, and trees strategically planted along waterways. The strips help reduce erosion, enhance landscapes, and provide wildlife habitat.



What kind of plants are used in the buffer strips?

Ash, cottonwood, willow, silver maple, oak and walnut trees; ninebark, dogwood, chokecherry, nannyberry, and high-bush cranberry bushes; and big bluestem, Indian grass, switchgrass, and native forbs.

How do the buffer strips work?

The vegetative strips slow water runoff, trap sediment, and enhance water infiltration in the buffer itself. In doing so, the system traps nutrients and pesticides that are then biologically modified to reduce the pollutants reaching surface and groundwater.

Dave Lubben



PASSAGES

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PFI partnership
Leopold Letter
Web site

Center, PFI embark on new relationship

The first research grant awarded by the Leopold Center in July 1988 went to the Practical Farmers of Iowa (PFI). This was just the beginning of a long, rewarding relationship between the two organizations that would span ten years and countless demonstration projects, research plots, and other joint ventures.

Because of their organization's deep commitment to on-farm research, PFI members have long been key players in Leopold Center-funded research and demonstration efforts on sustainable agriculture practices. Beyond the competitive grants program, the Center collaborated with PFI on the community-based Shared Visions project.

So it seemed only fitting that in FY 1998, the Center embarked on a new phase of its association with PFI. Through a memorandum of understanding, the informal relationship with PFI was translated into a more formal, long-term, structured partnership. Working with a Center allocation of up to \$50,000 annually, PFI will join with the Center and ISU Extension staff to share information with the farming public through field days, pasture walks, and farmer meetings. The new arrangement will also increase contacts and resource sharing among PFI members, the Center, and ISU College of Agriculture researchers and faculty.

Both organizations agree that this is a win-win situation. PFI President Dave Lubben said, "Because PFI works at the grassroots level, many of our projects have benefited from cooperation with the Center and ISU Extension. We hope to enhance this effort." Dennis Keeney pointed out that the Leopold Center "will gain ideas and experiences we could not get elsewhere."

Leopold Letter marks

With the arrival of the Spring 1998 issue, the Center's quarterly *Leopold Letter* celebrated its tenth anniversary of continuous publication (since 1989). Through 40 issues, the 12-page newsletter has consistently described Center education activities, explained its research projects, and offered diverse philosophical perspectives on sustainable agriculture issues. It has featured guest editorials from board and staff members, farmers, and researchers; it has also profiled farmers and interviewed scientists. Last but not least, it has kept nearly 5,000 subscribers posted on upcoming Center-sponsored events.

In 1994, the Society for Technical Communication cited the *Leopold Letter* for "Distinguished Technical Communication" in a regional competition. The newsletter was then forwarded to the STC's international competition, where it received an award of merit.

FIRST ISSUE OF LEOPOLD LETTER

ten years of service

In June 1996, then-newsletter editor Anne Larson assembled a focus group to determine whether the newsletter was meeting readers' changing needs. Feedback suggested that the newsletter's clean look, and its balance of research, education, and opinion articles, were appropriate for its audience. The focus group suggested more farmer perspectives, which the Center has since sought to include. And since 1996, the *Leopold Letter* has expanded its coverage through publication on the Center's World Wide Web site.

The newsletter is a team effort of the entire Leopold Center staff, who plan each issue together, then share responsibility for writing and critiquing stories. Newsletter editor Liz Weber shepherds the publication through each step of the process to ensure that readers receive a quality product. The *Leopold Letter* is an essential and enduring mechanism for informing constituents about how the Center's mission is interpreted in tangible ways.

MISSION OF THE LEOPOLD LETTER

...to inform diverse audiences, including farmers, educators, researchers, conservationists, and policymakers, about Leopold Center programs and activities; to encourage increased interest in and use of sustainable farming practices; and to stimulate public discussion about sustainable agriculture in Iowa.

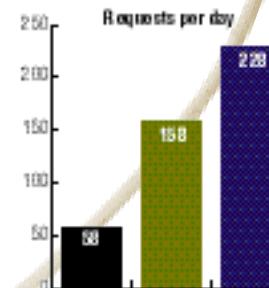
Leopold Center makes web site more appealing

The Leopold Center continues to expand its presence on the Internet as an integral part of conveying information about its research and programs. Mirroring the exponential growth of the World Wide Web, access to the Center's web site has grown over 300 percent since the first quarter of 1996 according to Anne Larson, Center communications specialist. In addition, the audience of the Center's web page has shifted from educational users to a balanced mix including consumers from private Internet accounts. This is a positive indication that curiosity about the Center's research in sustainable agriculture is spreading beyond the academic realm.

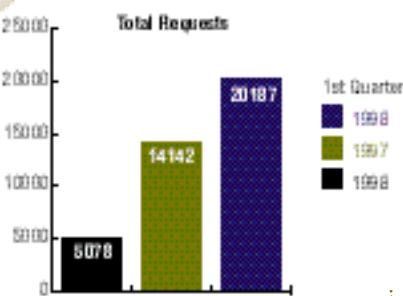
Among the improvements made to the site in 1997-98 were:

- A streamlined web address (<http://www.leopold.iastate.edu>)
- Links to Center researchers with active projects, making it easier for interested constituents to follow up for more current information
- Addition of more interactive content, such as downloadable educational freeware illustrating how water moves through the environment (<http://www.leopold.iastate.edu/centers/leopold/watercycle.html>)

With these continued improvements, the Center is striving to utilize the Internet to its fullest as a complement to its other communication vehicles.

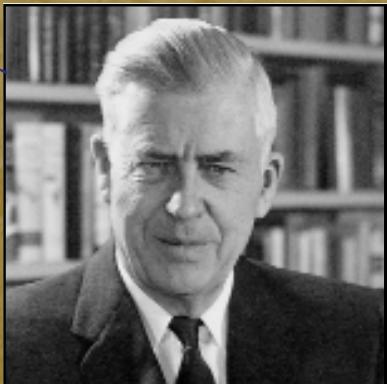


WEB SITE USAGE FROM 1996-1998



Web site update

Henry A. Wallace



PEOPLE

Wallace Chair
Visitors
Advisory board/staff

"It will allow ISU to serve Henry A. Wallace's legacy of keeping farm families working productively on the land." -Dennis Keeney

At the Center's tenth anniversary celebration in late July 1997, several panelists presented a look at Aldo Leopold and Henry A. Wallace, scientists and contemporaries, who were early advocates of many of the principles that now energize sustainable agriculture efforts. So it was only fitting that just a few months later, the Leopold Center joined in an effort to establish the Henry A. Wallace Endowed Chair for Sustainable Agriculture at Iowa State University.

In November 1997, ISU officials announced that a \$1 million grant from the W. K. Kellogg Foundation and a \$500,000 gift from the Wallace Genetic Foundation had been presented to the university to create the Wallace Chair. These bequests will be supplemented with funds from the Center and ISU's College of Agriculture. The endowment will provide perpetual funds for the faculty chair, for research programs, and for other sustainable agriculture efforts.

Wallace, an Iowa State alumnus, was vice president of the United States during Franklin Roosevelt's third term, 1941-45. He was a renowned plant geneticist and one of the founders of Pioneer Hi-Bred International. At his impetus, the Rockefeller Foundation started its international crop experiment stations in Mexico, the Philippines, and other developing nations. Wallace was also a groundbreaking statistician, a talented economist and the respected editor of two publications.

Center director Dennis Keeney, who attended the official presentation of the gifts in Washington, D.C., reacted enthusiastically to the endowment of the Wallace chair: "It will allow ISU to serve Henry A. Wallace's legacy of keeping farm families working productively on the land. The Leopold Center will work closely with the chairholder to assure that sustainable agriculture is well-served."

The Wallace chair will be a rotating position in the ISU College of Agriculture, with term length ranging from one to five years. The chairholder

Wallace Chair for Sustainable Agriculture

must possess a demonstrated record of achievement in sustainable agriculture, have national or international stature, and possess vision, strong communication skills, and an ability to work productively with constituencies of diverse viewpoints. It is expected that the chairholder will be a person who can provide broad-based leadership, rather than a specialist in some narrowly defined area.

David Topel, dean of ISU's College of Agriculture, appointed three people with ties to the Center to serve on the Wallace Chair Advisory Committee which will formalize the job description, conduct the job search, and recommend a candidate to serve as the first chairholder. Center director Dennis Keeney, Leopold Center Board member David Williams, and former board member Dave Lubben participated in the first meeting of the Wallace Chair advisory group in June, 1998. Funding for the chair will be available early in 1999 and the committee hopes to have the job search well underway by then.

Visitors

People who come from other countries to see what ISU's College of Agriculture has to offer are frequently directed to the Leopold Center to see what sort of research is being done in sustainable agriculture. Assistant director James Swan usually serves as the contact person for these groups and individuals who want a quick look at the Center and its programs.

Swan reports that international visitors to the Center came from nearly every continent last year. Among them were travelers from the Ivory Coast, Kenya, and Ukraine. Delegations that visited included ten members of a French pork producers cooperative (*Cooperatives des eleveurs de porcs du Leon et du Treguier*) and seven Japanese Extension Agents from

BUSINESS

1997-1998 Leopold Center Advisory Board

Current members:

- Leon Burmeister University of Iowa
- Shirley Danskin-White . . . Iowa Department of Agriculture and Land Stewardship
- Lenore Durkee Grinnell College
- Thomas Fogarty . . University of Northern Iowa
- Neil Hamilton Drake University
- Don Paulin . . Department of Natural Resources
- Sally Puttmann farmer, Kingsley
- Robert Sayre University of Iowa (chair)
- Colin Scanes Iowa State University
- Allen Trenkle Iowa State University
- Paul Whitson . . University of Northern Iowa
- David Williams farmer, Villisca
- Wendy Wintersteen . . Iowa State University

Ex officio members:

- Kurt Johnson Iowa Farm Bureau
- Paul Mugge Practical Farmers of Iowa
- Marvin Shirley Iowa Farmers Union
- Craig Struve and Jim Penney . . Agribusiness Association of Iowa

Kagoshima City. From South Korea came Z. R. Choe, Korean Association for Sustainable Agriculture, Inc., and Agronomy Department, Gyeongsong National University, South Korea.

Representatives of these foreign academic institutions toured the Center: the Danish Institute of Plant and Soil Science, Tjele, Denmark; Debrecen Agricultural University, Hungary; University of Agriculture, Nitra, Slovakia; and Massey University, Palmerston North, New Zealand.

A group of four Honda R&D, Americas, Inc. engineers also visited the Center, as did Joseph Okoh, Acting Department Chair of Natural Sciences, University of Maryland—Eastern Shore.

DENNIS KEENEY, ROBERT SAYRE, JERI NEAL



MIKE DUFFY, COLIN SCANES



How the board does business

Besides receiving frequent mailings from the Center, the advisory board meets four to five times yearly. Two of the meetings are devoted almost exclusively to the competitive grants process; in September the board reviews the pre-proposals to decide which ones will be directed to proceed with preparing full proposals and in February they scrutinize the resulting proposals and make final funding decisions. The other meetings are taken up with progress reports from the Center's issue teams and other researchers, discussions about Center policies and activities, and planning for the future.

Of necessity the grants consideration meetings are held in a quiet location. But for other meetings the Center has experimented with teleconferencing and considered using the ICN. Different venues outside of Ames, such as the Iowa Arboretum near Madrid, are popular. But the most unusual meeting location was the summer 1997 board conclave held at Dick Thompson's farm near Boone. After touring several of Thompson's sustainable agriculture research sites, the board convened amongst the farm implements in a very fine machine shed to conduct its regular business and hear from the weed management team and the agroecology team.

DAVE WILLIAMS, MARVIN SHIRLEY

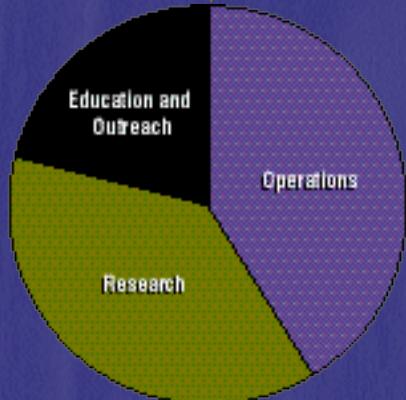


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- Rich Pirog Education Coordinator (rspirog@iastate.edu)
- Elizabeth Weber Editor*

Leopold Center for Sustainable Agriculture

Fiscal year 1998



CLOSING

Budget/Accounting
Tree thoughts

32

Funding:

	Operations	Research	Education & Outreach	Totals
AMA [†]	\$1,100,000	-	-	\$1,100,000
GPR		\$390,000	\$170,000	560,000
EPA ^{††}	-	-	-	-
Balance	201,071	547,587	351,342	1,100,000
Total Funds	1,301,071	937,587	521,342	2,760,000

Expenditures:

Salaries & Benefits	307,975	67,007	124,442	499,424
Office Expenses	47,520	28,080	44,400	120,000
Competitive Grants	-	502,500	247,500	750,000
Issue Teams	-	300,000	-	300,000
Moving Expenses (Office Relocation)	10,000	-	-	10,000
Education Programs	-	-	25,000	25,000
Director's Research (Emerging Issues)	-	20,000	-	20,000
Research Initiatives	-	20,000	-	20,000
New Publications	-	-	15,000	15,000
Conference Grants	-	-	35,000	35,000
Annual Conference	-	-	15,000	15,000
Year of Water	-	-	15,000	15,000
Reserve FY 1999	660,000	-	-	660,000
Total Expenditures	1,025,495	937,587	521,342	2,484,424
Fund Balance	275,576	-	-	275,576

[†] Because the Center receives Agriculture Management Account funds quarterly, a balance is carried over to the next fiscal year (July 1-June 30). This funds the entire year's salary and benefits encumbrance by Iowa State University. It also allows for operational expenditures as well as partial funding for competitive grants until the first quarterly payment is received.

^{††}This Environmental Protection Agency Environmental Technology grant to the Iowa Department of Agriculture and Land Stewardship, Pesticide Bureau (James F. Elleroff, Principal Investigator), including the Leopold Center as a major partner and recipient of funds. The project title was "The pesticide industry and sustainable agriculture: signpost for the future" and it resulted in the book *Bugs in the System*.

Why we planted a tree on April 22...

JIt was more than a year ago that the Leopold Center staff first thought of planting a tree in memory of Aldo Leopold. Initially we wanted to do it in connection with the Center's tenth anniversary conference, but that was the wrong season of the year and there were already plenty of activities scheduled. But when it came to marking the 50th anniversary of Leopold's passing in April, the idea of planting a tree in honor of Aldo had found its time.

There were obvious lifelong connections between Aldo Leopold and trees—he was a graduate of the Yale School of Forestry and worked for the U.S. Forest Service. Trees were an integral part of life at Leopold's beloved "shack" in Wisconsin. The "Bur Oak" essay from his *A Sand County Almanac* says, "He who owns a veteran bur oak owns more than a tree. He owns a historical library, and a reserved seat in the theatre of evolution."

Going beyond the fabled Leopold links to trees, Center staff members found themselves alternately pleased, touched, and proud of the fine young oak that now stands south of Curtiss Hall. As one staffer put it, "I know it's silly, but I gave the tree a name. It was fun to watch it flourish after we planted it. Soon the buds started to appear, then the leaves. Now it's covered with leaves and they're getting bigger! Every time I walk by I have to look over and see how it's doing. And every

time I look at it I have to smile. It makes me feel good to see it. It also makes me feel like we really belong here now. This is 'our' tree."

In many ways, the tree serves as a metaphor for the Center. Beneath the trunk of competitive grants and the branches and leaves of outreach and education, there are some sturdy staff roots supporting the Leopold Center. Even though the Center staff has been kept small (8.3 FTEs) to maximize the amount of money available for funding research in sustainable agriculture, the level of commitment and pride shown by the staff are strong. The Leopold Center for Sustainable Agriculture is one workplace where staff feel that their contribution can truly make a difference.

*"Acts
of creation are
ordinarily reserved
for gods and poets,
but humble folk may
circumvent this restriction
if they know how. To plant
a pine, for example, one need
be neither god nor poet; one
need only own a shovel."*

-Aldo Leopold



*And that is why we planted a tree
in Aldo's memory.*