



**LEOPOLD CENTER**  
FOR SUSTAINABLE AGRICULTURE

**ANNUAL REPORT 2022**



**Timothy A. Wise presentation  
revives Shivers Memorial Lecture**

Ames, Iowa

**A**fter a several-year hiatus, the Shivers Memorial Lecture was revived in 2022 with a presentation by author and agriculture policy researcher Timothy A. Wise. His lecture, “Eating Tomorrow: Climate Change and the Battle for the Future of Food,” was presented April 4, in the Iowa State University Memorial Union.

Wise is the author of the 2019 book, “Eating Tomorrow: Agribusiness, Family Farmers, and the Battle for the Future of Food.” He is a senior advisor at the Institute for Agriculture and Trade Policy, where his work focuses on agribusiness, family farmers and the future of food, and a senior research fellow at Tufts University’s Global Development and Environment Institute, where he founded and directed its Globalization and Sustainable Development Program.

The Shivers Lecture, focused on issues of sustainability, agriculture and the food system, has been hosted by the Leopold Center since 1969 with support from the Shivers Family in memory of John Shivers, who farmed near Knoxville.



Timothy Wise presenting Shivers Memorial Lecture, April 2022.

**Farmer, educator Mark Quee selected for  
Leopold Center’s 2022 Spencer Award**

By Ann Y. Robinson

**T**he Leopold Center for Sustainable Agriculture presented its 2022 Spencer Award to Mark Quee, a farmer and educator from West Branch, Iowa, in recognition of his contributions to the advancement of practices that will make agriculture more sustainable. The award was presented at the 2022 Iowa Water Center conference, Sept. 28 in Dubuque.

Quee manages a small, certified organic farm that helps feed the Scattergood Friends School community and visitors year-round. He has been the leader in making the farm an integral part of the curriculum for high school and middle school classes at the Quaker-based boarding school near West Branch.

Quee is also known for his on-farm research through involvement with the nonprofit Practical Farmers of Iowa. In 2019, he received PFI’s Master Researcher Award for work that has included 25 on-farm field trials on topics like cover crops, insect and weed controls, transitioning pastures to vegetables and grazing vegetable plots with sheep.

Lee Tesdell, a landowner and conservation leader from Slater, Iowa, who graduated from Scattergood in 1968, wrote in support of Quee’s Spencer Award nomination. “The farm Mark manages today provides lamb, beef, poultry, vegetables and fruit in a sustainable environment. Some of the former row-crop ground has been planted in trees and perennial grasses, which has improved the soil health and the quality of the water leaving that hilly farm,” Tesdell said. “Another important aspect of his legacy of stewardship is the respect for the land and livestock his students take away from the experience of working with him.”

“Mark is an inspiring and deserving recipient who is known as an organic farmer and food provider, a teacher and on-farm researcher who has shared his knowledge generously over many years,” said Leopold Center Interim Director Stephen Dinsmore.

Read the full Spencer Award 2022 story on the Leopold Center website. The Spencer Award honors Norman and Margaretha Spencer, who farmed in Woodbury County, Iowa, for 40 years. Graduates of Iowa State, the Spencers maintained an active relationship with the university and several professors who encouraged them to research sustainable practices and family farming. The Spencer Family established the award in 2001.



Mark Quee (left) receiving 2022 Spencer Award from Leopold Center for Sustainable Agriculture Interim Director Stephen Dinsmore.

## Dear Friends of the Leopold Center,



It is my pleasure to share with you the 2022 annual report of activities with the Leopold Center for Sustainable Agriculture. We've had a productive year and have enjoyed a slow return to normal activities as the global pandemic continues to ease.

As you'll see, the Center continues to support a range of activities related to sustainable agriculture. This report contains summaries from some of the activities we supported in the last year. Our focus remains on research and Extension activities as we seek to promote sustainability in agriculture in Iowa and beyond.

This year also saw the return of two important events supported by the Leopold Center. We were excited to revive the Shivers Memorial Lecture by hosting Timothy Wise for a talk on the future of global food and its related challenges. The talk was attended by more than 80 people. The Center also reinvigorated the Spencer Award, which we were pleased to present to Mark Quee at the annual Iowa Water Center Conference in Dubuque last fall. We plan to continue both activities, thanks to generous donors. The financial summary included in this report shows that the Center is in good standing.

I'll close by saying thank you to everyone who continues to support the activities of the Leopold Center for Sustainable Agriculture. We remain committed to our mission to identify and develop new ways to farm profitably while conserving natural resources and reducing negative environmental and social impacts. We need your help to be successful. We are also here to help—as a resource for technical information, as a possible funding partner (inquire directly with me if you have a request) or to help disseminate important findings that relate to sustainable agriculture.

Best wishes for the coming year!

Stephen Dinsmore, *Interim Director*



Stephen Dinsmore

Migrating shorebirds on farmed wetlands in Franklin County in the fall.

## 2022 FINANCIALS ISU Foundation Accounts

<b>2021 BALANCE CARRY FORWARD</b> .....	<b>\$120,613</b>
<b>INCOME/ENDOWMENT EARNINGS</b>	
Restricted* .....	\$3,809
Unrestricted .....	\$241,283
<b>Subtotal Current Income</b> .....	<b>\$245,093</b>
<b>EXPENSES</b>	
Operations .....	\$8,239
Restricted Expenses* .....	\$5,607
Unrestricted Expenses .....	\$200
Obligated Support—ISU .....	\$21,952
Research Projects .....	\$148,677
Organizational Support .....	\$200
<b>Subtotal Expenses</b> .....	<b>\$184,875</b>
<b>2022 BALANCE</b> .....	<b>\$180,831</b>

\* Restricted accounts are funded by the Shivers and the Spencer Family Endowment funds.

## Research explores effective communication with farmers on edge-of-field conservation practices

By Jacqueline Comito, program director, Iowa Learning Farms

The Iowa Nutrient Reduction Strategy, introduced in 2012, calls for 45% total load reductions in nitrogen and phosphorus, and outlines potential reductions achievable through a wide range of in-field and edge-of-field conservation practices. While we have extensive knowledge regarding the incentives and barriers for working-land conservation practices, we have much less understanding of what induces or inhibits landowners' and farmers' adoption of edge-of-field (EOF) practices.

As part of a 2021 project funded by the Iowa Nutrient Research Center, State Soil Conservation and Water Quality Committee and Leopold Center for Sustainable Agriculture, Jacqueline Comito and Wendong Zhang conducted a survey eliciting responses from about 400 northern Iowa farmers who provided information on their attitudes toward three edge-of-field practices: water quality-enhancing wetlands, saturated buffers and bioreactors.

Important findings concerning the messenger and message need to be explored more fully including that financial incentives alone are not enough to important individuals to consider implementing EOF practices. Other key findings include:

- Farmers are more responsive when the messages include not only water quality benefits but also wildlife benefits of the EOF practices.
- Even for EOF practices that require more knowledge and expertise, the message from an early farmer adopter was significantly more effective than from an Extension professional.
- An infographic-style factsheet, as used by Iowa Learning Farms, was more convincing to farmers than video narratives by a farmer or an Extension professional.

The project confirms the potential important role of peer messaging in promoting conservation practice adoption, but also opens additional questions about effective messaging to farm audiences.

## Biochar as potential carbon stabilizer and greenhouse gas mitigator from swine manure: Summary of work on Leopold Center grant

By Chumki Banik, research scientist, Department of Agricultural and Biosystems Engineering, Iowa State University

Swine manure contains a significant amount of carbon, but a long-term application of manure to soil is needed to increase total soil carbon. The highly volatile nature and low carbon-to-nitrogen ratio of the manure solids makes manure highly unstable upon application to soil. Biochar, the carbon-rich co-product of biomass pyrolysis, is gaining interest as a soil amendment to build soil carbon and sequester carbon from the atmosphere. However, little is known about its influence on the reactive carbon fraction and total carbon stability of manure. Improving the understanding of these influences was the focus of a one-year Leopold Center-funded project.

Our research team prepared an engineered corn stover biochar using iron sulfate pretreatment following autothermal pyrolysis. The biochar is slightly acidic, and we chose it because it can significantly capture manure ortho-phosphorus, thus improving manure nutrient management. This study, however, evaluated biochar's impact on stabilizing manure reactive carbon fractions using a laboratory-based experiment. The experiment was conducted using this engineered biochar at different application rates and then aged for one month. The study evaluated manure's organic matter decomposition rate after the short aging with biochar.

Critical findings from the study are:

- Biochar addition to manure following aging improved the manure reactive carbon fraction stability.
- The organic matter decomposition of manure-biochar mixtures decreased with increasing biochar additions.
- The biochar addition to manure increased the total recalcitrant (slowly biodegradable) carbon fraction and hindered microbial respiratory carbon dioxide loss.
- The biochar additions stabilized phosphorus and nitrogen levels and reduced the rate of loss from the manure.
- Bioavailable fractions of copper and zinc were also reduced in the manure by the biochar additions.

Based on this experiment, we anticipate a more rapid increase in soil total carbon fraction and a reduction in nutrient loss issues with the application of a manure-biochar mixture over application of manure only.

This work was presented in the fall of 2022 at the American Chemical Society conference in Chicago, Illinois, and a peer-reviewed manuscript is under review. We wish to continue this work and plan to seek further funding, using the initial findings of this experiment.

## Leopold Center for Sustainable Agriculture records available at ISU Digital Repository

Leopold Center records, including reports from completed grants, are on file at the Iowa State University Library Digital Repository. Also archived are Leopold Center annual reports, conference papers, proceedings, publications and papers, Extension and Outreach publications, and The Leopold Letter quarterly newsletters. Topics covered range from nutrient management, microenterprise establishment, local food systems, entomology, agroforestry and horticulture.

Find the treasure trove at: <https://go.iastate.edu/OSYDHT>



Master Conservationist Program

Master Conservationist Program participants explore aquatic ecosystems during the Winneshiek and Allamakee counties offering.

## Iowa Master Conservationist Program continues to grow

By Kaycie Waters, agriculture and natural resource specialist, Iowa State University Extension and Outreach

Growth of the Iowa Master Conservationist Program sponsored by Iowa State Extension continued during 2022 as 17 course offerings were organized throughout the state. The 2022 offerings were organized and led by 24 extension districts. More than 250 people completed the course in 2022, the biggest year for the program since its redesign in 2017.

The program aims to equip Iowans interested in natural resource conservation with the knowledge and skills necessary to make informed decisions about natural resources and to become local leaders and educators. The curriculum is structured into four modules focused on Iowa's natural prairie, forest and aquatic ecosystems, which combine technical information presented and curated by Iowa State University researchers and educators. Local conservation leaders, practitioners and experts lead in-person sessions. The standard course format consists of 12 hours of in-person educational contact time and 19 hours of online educational contact time.

When participants were asked if they intended to implement practices or principles they learned on land they own or have influence over, 97% responded "Yes" in 2022. Respondents indicated an intent to impact 14,379 acres of land with lessons from the class.

In addition to leadership from Extension and its local districts, a diverse group of external partners, including the Leopold Center, contributed to the success and growth of the program by organizing and supporting offerings throughout the state.

More than 650 people have completed the Master Conservationist Program since 2017. Find more information or apply to participate in the program at: <https://naturalresources.extension.iastate.edu/programs/master-conservationist>.

## Leopold Center 2022 News Highlights

### Mapping ecogeomorphic traits in floodplain plant communities

The Leopold Center funded a proposal led by Peter Moore, adjunct assistant professor in the Department of Natural Resource Ecology and Management at Iowa State. The award supports environmental science graduate student Kelvin Adu Baah and a field assistant. The goal of the research is to assess the impacts of riparian and floodplain vegetation on deposition and storage of sediment and sediment-bound phosphorus in floodplains. The award helped fund work primarily taking place during the summer 2023 field season.

### Cover crops: Benefits of mixtures versus single species

Findings from a Leopold Center-supported grant were reported in the article “Cover crop mixtures versus single species: Water quality and cash crop yield” by Emily Waring, Mark Licht, Elizabeth Ripley, Ann Staudt, Sara Carlson and Matthew Helmers, published in the *Journal of Soil and Water Conservation* (online in December 2022).

Read details on the research and the authors’ findings and recommendations at: <https://www.jswconline.org/content/early/2022/12/09/jswc.2023.00174>.

### From nuisance to asset: Establishing saturated riparian forest buffers on the landscape

An Iowa Learning Farms virtual field day Dec. 15, 2022, highlighted saturated riparian forest buffer research at Iowa State with a live discussion and a chance to view a recently established saturated buffer forest site funded by the Leopold Center.

The presenters were Billy Beck, assistant professor and extension forestry specialist, Troy Heeren, agricultural specialist, Gabe Johnson, doctoral graduate research assistant in sustainable agriculture and agricultural and biosystems engineering, and Jonathan Notch, senior in forestry. A recording is available in the Iowa Learning Farms field day archives at: <https://www.iowalearningfarms.org/resources/field-day-riparian-forest-saturated-buffer>.

### Rural drinking water survey shows significant nitrate risks for many Iowans

A drinking water survey released in August 2022 revealed that many Iowans have a stark risk of exposure to potentially unhealthy drinking water, based on self-reporting of recent testing, use of reverse osmosis filters, use of supplemental water sources, risk of nitrate exposure and other factors.

The Iowa Drinking Water Survey was conducted by the Conservation Learning Group, a think tank based at Iowa State University Extension and Outreach, and the Center for Agricultural and Rural Development (CARD) at Iowa State University. Funders included CARD, the Leopold Center, and the USDA National Institute of Food and Agriculture.

The study concluded that about three-fourths of surveyed



Iowa Learning Farms

*Water Rocks! staff leading an activity for elementary students at the Newell-Fonda school in northwest Iowa.*

households were at risk of exposure to potentially unsafe water.

Read the report and its other key findings at: <https://www.extension.iastate.edu/news/rural-drinking-water-survey-shows-significant-nitrate-risk-many-iowans>

### Leopold Center continues support for ILF and Water Rocks!

The Leopold Center continues its long support of the Iowa Learning Farms and its Water Rocks! youth education programs. Through in-person field days, virtual field days and weekly online webinars, ILF programs reach farmers, landowners, agribusiness, researchers and agency partners with wide-ranging conservation topics aimed at building a “culture of conservation” in Iowa. In 2022, approximately 7,400 people participated in ILF programming that included 77 outreach events ranging from guest presentations to Conservation Station trailer appearances at county fairs and community festivals.

Combining sound science with music and the arts, the award-winning youth water education program Water Rocks! provides the next generation with high-energy, high-impact environmental outreach that includes classroom visits, virtual presentations, teacher summits, Water Rocks!: The Musical and other events. During the 2021–22 school year, Water Rocks! provided 437 total interactive presentations and engaged with a total of 9,702 students.

### Other

Other programs and activities the Leopold Center provided support or sponsorship for in 2022, included:

- Provided \$30,000 to support students in the Graduate Program in Sustainable Agriculture (GPSA).
- Co-sponsored GPSA seminar: A Strategy for Decolonizing Science, Management, Ownership, Governance. Presentation by Reginaldo Haslett Marroquin, Nov. 2.
- Provided copies of “A Sand County Almanac” by Aldo Leopold to Master Conservationist Program graduates.
- Co-sponsored Ames Reads Leopold 2022 event at Brookside Park, Ames, April 24

Stay informed about the Leopold Center and its current and recent activities at <https://www.leopold.iastate.edu/>.