

Letter

Prices on the rise

How will higher energy costs impact farmers?

EDITOR'S NOTE: As energy costs rise nationwide, associate director and extension economist Mike Duffy looks at the impact of higher energy prices on farmers. For them, it's more complicated than paying the bills for heating oil and diesel fuel, or getting a guaranteed price for anhydrous ammonia.

Looking at all farm expenses, those most directly associated with energy – for fuel, fertilizers and pesticides – added up to 16 percent of total farm expenditures in 1998. Duffy reports that energy costs are driving up the cost of production, possibly more than any other factor in the coming year.

By Mike Duffy
Associate Director

When considering the impact of higher energy prices on farmers, it is important to remember that the amount of energy used in agriculture is small compared to overall energy consumed in the United States. The U.S. Department of Energy only considers four sectors in its energy statistics: transportation, industrial, residential and commercial purposes. Agriculture is not even considered a separate sector with respect to total U.S. energy use.

But energy is important to agriculture. It is easy to see how farm use of

petroleum products has grown over the past 50 years by looking at the relative expenditures for major energy components in Iowa agriculture. The graph on page four shows the percent of total farm expenditures in Iowa since 1949 for three primary energy components: fuel, fertilizer and pesticides.

Energy for fuel

Fuel includes both petroleum and oil used on the farm. It is what we think of most often when we think of energy use. In the 1950s, fuel averaged approximately 6 percent of a farmer's

ENERGY

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Survey looks at how farmers make decisions about manure management

by Mary Adams
Leopold Center Staff Editor

Once upon a time, small farmers with diversified farm operations simply recycled the manure from their livestock onto their crop fields. There the wastes were safely dispersed to serve as a natural fertilizer and enhance agricultural productivity. With the advent of inexpensive chemicals that replaced manure as fertilizer and the increase in

large livestock operations, the cycle has gone awry. There's a lot more manure to dispose of, and fewer places where it can be applied safely.

A major concern in the debate about large-scale, highly intensive livestock production focuses on the impact that expanding supplies of sometimes poorly managed manure exert on water and air quality. The U.S.

SURVEY

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Welcome two new faces at the Center

On the advisory board ...

A Swea City grain farmer has joined the Leopold Center Advisory Board. Arlyn Valvick has been selected by the Iowa Farm Bureau Federation as one of three farmer representatives who serve on the 17-member advisory board. Valvick succeeds Kurt Johnson, an Audubon County sheep producer who had been a board member for six years.

With help from Arlyn's father Irving, Arlyn and Annette Valvick raise 1,400 acres of corn and soybeans and 52 acres of certified organic crops on their northern Kossuth County farm. He is president of the Kossuth County Farm Bureau and a graduate of the Iowa Farm Bureau Leadership Institute. He is a member of Practical Farmers of Iowa, cooperating in that group's on-farm research the past two years. He also is

a member of the Organic Crop Improvement Association and is active in his local church, fire department and community theater. He is vice president of the Kossuth County Taxpayers Association, and is past president of FFA Alumni. The Valvicks have four daughters. Arlyn is a lifelong resident of Kossuth County.

On the staff ...

Callers to the Leopold Center looking for hope now get the newest staff member, Hope Kepler, who joined the staff in December. She fills a vacancy left by John Lane, who returned in August to his home state of Maryland after four years at the Center.

Hope answers the telephone, fills requests for information, helps staff with projects and maintains a library of past and current reports and publications. She has office experience



Arlyn Valvick



Hope Kepler

in the medical field and with non-profit organizations, however, most of her work since graduating from the College of Family and Consumer Sciences at Iowa State University has been in human services.

An Iowan all her life, Hope remembers playing on her grandfather's dairy farm in Grundy County and listening to farmers when they gathered at the local gas station for coffee. She brings a lot of organizational skills to her job and plans to help prepare office spaces for remodeling this summer.

NEWS & NOTES

The story of sustainable agriculture reached new audiences this spring. Leopold Center director Fred Kirschenmann and his wife, Carolyn, hosted a writer from *Gourmet* magazine last fall. An account of her visit appears in the February 2001 issue. The author closes her three-page feature with Kirschenmann explaining a new vision for agriculture.

* * *

Sustainable agriculture also was the highlight for the January/February 2001 issue of *Visions*, the Iowa State University's glossy alumni magazine. The 12-page section features pieces on the Leopold Center, hoop houses, the Bear Creek buffer project, Gary Guthrie and his local food system work, and central Iowa organic farmer Dick Thompson. The magazine is online at <http://www.alumni.iastate.edu/news_views/VISIONS/Winter01/agriculture.html>.



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

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

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Taking a long look at short supplies

Energy use on farms isn't a new topic for the Leopold Center. Although higher energy costs indicate a current crisis, there may be even more dramatic effects in the years ahead.

As we all know, modern industrial agriculture has achieved much of its success by replacing labor with energy and capital. This strategy worked remarkably well because we had ample supplies of cheap energy. However, agriculture's heavy reliance on petroleum as the primary source of energy is catching up with us.

The "petroleum era," as some geologists call it, is rapidly coming to a close. Being part of this era sometimes blinds us to how brief this period is compared to the rest of human civilization. The first American commercial oil well was drilled in 1859 in Titusville, Pennsylvania. According to an essay in the March 1999 issue of *Scientific American* by oil industry analysts Colin Campbell and Jean Laherrere, we have about eight years of "cheap oil" left. Recent increases in prices for diesel fuel, anhydrous ammonia and pesticides—all petroleum-dependent products—indicate that their prediction may be correct.

Campbell and Laherrere remind us that the problem is not that we will run out of oil anytime soon. Rather, our ability to acquire oil "cheaply" will end. They attribute the end of the "cheap oil" era to a combination of increasing demand and the fact that the "last bucket of oil" cannot be pumped from the ground as quickly as the first. They explain that the rate at which any well (or country) can produce oil "always rises to a maximum and then, when about half the oil is gone, begins falling back to zero." We are now on the other side of the "half-gone" oil.

We're faced with a conundrum: If we don't reduce our reliance on oil to the same extent that our capacity to produce it slows, oil prices will necessarily rise. What's a farmer to do?

We're faced with a conundrum: If we don't reduce our reliance on oil to the same extent that our capacity to produce it slows, oil prices will necessarily rise. What's a farmer to do?

Some farmers, especially those producing corn, hope that biofuels have a bright future, both as a new source of cheap energy and as a new source of revenue. (In our most recent newsletter, we told you about burning switchgrass for fuel.) However, studies to assess the potential of various biofuel systems to meet all future energy needs yield mixed conclusions. Researchers Giampietro, Ulgiati and Pimentel report in *Bioscience* magazine, "large-scale biofuel production is not an alternative to the current use of oil and is not even an advisable option to cover a significant fraction of it."

I'm not suggesting that biofuels have no future. It may be that small-scale, on-farm biodiesel units and properly managed ethanol plants can fill some of our needs, at least while we move from petroleum to some other energy source. Biofuels, however, probably will not be the silver bullet that saves farmers from the coming energy crisis. Producing crops to burn for fuel also raises the troublesome prospect of diverting farmland to energy production, just as demographers warn us that we may not have sufficient land to produce enough food for an expanding population.

Energy conservation may be one fruitful avenue for farmers to pursue in the immediate future. We all learned that we could dramatically reduce our energy use during the energy crisis of the 1970s. This strategy, more than anything, helped us survive temporary energy shortages. Of course, farmers can't just shut down their tractors. But we can reduce tillage, judiciously use petroleum-based inputs and adopt better management practices to

decrease purchased inputs.

A 1993 North Dakota State University study comparing the performance of conventional, no-till and organic farms offered some interesting conclusions. It showed that when total energy flows were considered, no-till farms consumed 30 percent less energy than their conventional counterparts. Organic farms consumed 70 percent less energy than conventional farms, and yields were comparable for all three farms. No-till and organic management may not be for everyone, but this study supports the idea that farmers may be able to adopt practices that can curtail energy costs, conserve soil and water, and still produce optimum yields.

Midterm energy solutions will likely include a combination of energy conservation, new technologies and more diversified energy sources. These would include wind, solar, biofuels, hydro-electric, hydrogen, coal and natural gas.

Over the long haul, we need to develop technologies and systems that enable us to eliminate energy waste and use entirely "current" energy. Use of "borrowed" energy—solar energy that has been stored in the form of oil, coal and gas—must end.

Our food systems also must become more energy efficient. Four percent of our national energy budget is used to grow food, while 10 to 13 percent is required to put it on our plates. As energy costs go up, regional food systems will have a distinct competitive advantage.

Meanwhile, don't bet the farm on the price of diesel fuel going down anytime soon.



Today's energy situation differs from 1970s shortages

ENERGY

(continued from page 1)

total expenditures. The cost of fuel dropped as a percentage until the 1973 energy crisis, then rose to almost 6 percent in 1981. The percentage of farm expenditures associated with petroleum and fuel has declined almost continually since the 1980s to 2.6 percent in 1998.

Energy price increases, especially for fuel, are highly visible and immediately impact the costs of production. In agriculture, however, energy price increases do not represent a major, short-run increase in the costs of production. Iowa State University estimates that a 40 percent increase in diesel fuel would increase non-land costs from 1 to 2 percent.

Energy for fertilizer

Commercially produced fertilizer is another major energy component of Iowa agricultural production. About half of the nitrogen fertilizer used in Iowa is anhydrous ammonia, which is made from natural gas. Fertilizer costs also include lime, and estimates of the amount of energy needed to manufacture various types of fertilizer vary considerably. Reliable estimates from the Department of Energy show that 5 pounds of nitrogen has the energy

equivalent of a gallon of diesel fuel. In other words, 100 pounds of nitrogen fertilizer would have the energy of 20 gallons of diesel fuel.

The graph below shows that expenditures on fertilizer, as a percent of total farm expenditures, have risen and fallen dramatically. Fertilizer expenditures peaked in 1975 at 10 percent of total farm expenditures. Then they dropped, but have since risen to 7 percent in 1998.

The 2001 estimated costs of crop production from Iowa State University Extension show that fertilizer and lime costs will rise from the current 7 percent level to almost 14 percent of total costs in corn production, and 9 percent of total costs for soybeans. This estimate uses a price of \$340 per ton for anhydrous ammonia, and assumes that half of the total nitrogen applied will be from anhydrous. If the price of anhydrous jumps to \$420, total costs of production for corn after soybeans would increase by 1 percent and the non-land costs would increase by 2.3 percent.

Energy for pesticides

Pesticides are made from petroleum. The exact amount used depends on the product, the formulation and so forth. A common measure used is that it

takes the equivalent of a gallon of diesel fuel to make one pound of active ingredient of pesticides. The graph below shows that pesticides, as a percent of total farm expenditures in Iowa, have risen from nearly zero in 1950 to a high of 6.9 percent in 1996. In 1998 they represented 6.5 percent of total farm expenditures.

Overall energy impacts

If we look at energy-related expenditures as a percent of the intermediate costs of production (for seed, chemicals and other values that vary from year to year), the percentages change but the general situation does not. In 1998, fuel represented 4 percent of intermediate expenditures, fertilizers were 12 percent and pesticides were 10 percent.

The recent increases in the price for energy have resulted in higher costs of production for Iowa farmers. The ISU estimated costs of crop production show that corn costs of production will rise by more than 5 percent from 2000 to 2001 as a result of higher petroleum costs. Soybean costs are not rising as much because nitrogen fertilizers are not used on this crop.

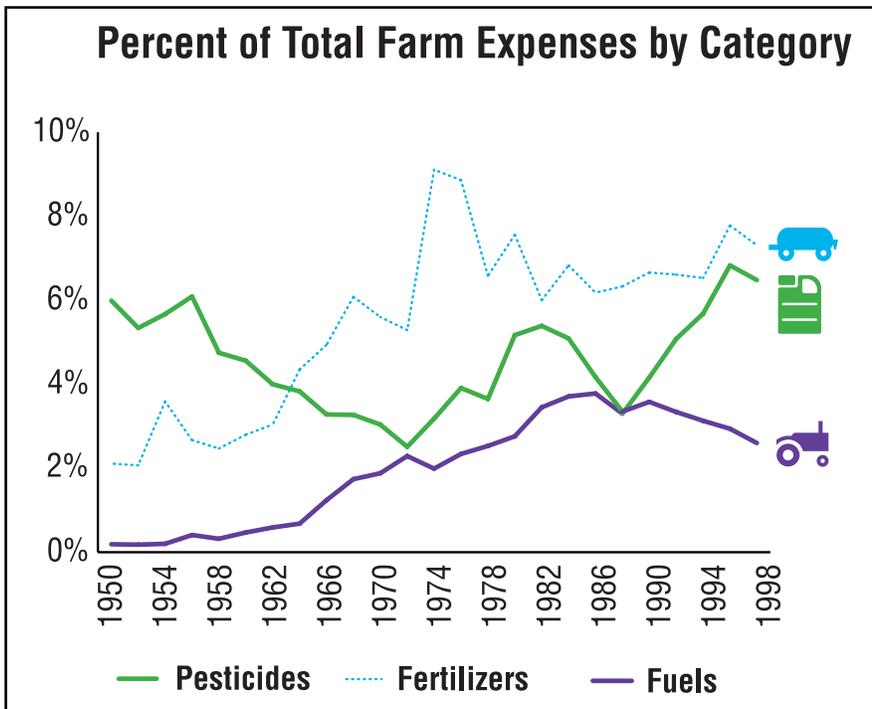
What does this mean?

Cost of production estimates have varied considerably over time. In the ISU series, the highest cost estimates were in the early 1980s. Land is the single biggest cost of production component. For soybeans, the cost of land averages more than 40 percent of total production costs. For corn, land costs on average make up 35 percent of the cost of production.

In the past, changes in the cost of production have been primarily due to

ENERGY

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For more information

Want to make the best use of the nutrients you already have for crop production? Check out the NPKnowledge web site from ISU Extension: <<http://extension.agron.iastate.edu/NPKnowledge/>>.

ENERGY *(continued from previous page)*

changes in the cost of land. There have been shifts in the relative portion of other cost components as technology and farming practices change. Today's situation is different because increases in the cost of production are almost entirely the result of changes in the price of energy.

Farmers have many options and alternatives as they try to adjust to higher energy costs. But it's important to realize that increases in energy costs affect more than a farmer's fuel bill. It is equally important for us to realize that these increases will not likely go away. For the foreseeable future, the costs of energy will remain relatively high and it is in our best interest to start to deal with how to adjust to increased prices.

ENERGY EQUIVALENTS:

Diesel Tractor Fuel *(use depends on tillage practices, crops grown)*
2.6 % total farm expenditures



Fertilizers* **1 gallon diesel fuel = 5 lb. nitrogen fertilizer****
7 % total farm expenditures



Pesticides *(derived from petroleum)* **1 gallon diesel fuel = 1 lb. active ingredient*****
6.5 % total farm expenditures



* Calculated on average use of the most common products applied according to industrial standards
** Nitrogen fertilizer is derived from natural gas.
*** Will vary depending on formulation

BOOK REVIEW

Local lessons from world travels

**Food's Frontier:
The Next Green Revolution**
Richard Manning, North Point Press, 2000 240 pp., \$24.00

Richard Manning's latest book is a fascinating look at alternative approaches to research in food production. He travels the globe reporting on an array of projects funded by the McKnight Foundation, but captivates us with his easy writing style and more than research details.

He spends the first chapter discussing the accomplishments of the first Green Revolution. Manning reports his interviews with leading scientists from around the world, which lead to a discussion of the problems that have arisen due to solutions espoused in the Green Revolution. He touches on several issues including chemical pollution, energy use and displaced populations.

Manning is not overly critical of the Green Revolution but he points out changes in the world that have occurred and the fact that we

must look beyond the solutions proposed by the Green Revolution. We must begin to consider local knowledge and work more closely with indigenous peoples rather than merely presenting them with outside answers.

Manning reports on nine projects in Ethiopia, Uganda, Zimbabwe, India, China, Brazil, Chile, Mexico and Peru, and places each project in context with its local situation. He also illustrates problems encountered by people working in underdeveloped countries. He shares tales of scientists working in nearly empty offices and laboratories, funding problems and ever-present threats if one does not embrace the correct political persuasion.

Manning devotes one chapter to a discussion of biotechnology and its role, especially as it relates to projects for less developed countries. He presents the best, most rational discussion of the pros and cons, applications and misapplications, of biotechnology that I have seen.

The final chapter summarizes what Manning has learned during his

travels. Many of the problems encountered by people working on these projects could have been avoided had there been more communication in all directions— from researchers, funding agencies, government and local farmers.

Food's Frontier is not just a whack at the Green Revolution. Quite the contrary, this book looks at the present situation and tries to offer suggestions about how it could be improved. Manning writes, "If there was a key mistake of the Green Revolution, it was in simplifying a system that is by its very nature complex."

Manning has done a marvelous job explaining projects in their broader context. He is balanced and not afraid to offer his observations on what appears to be working, not working, and why. This is truly a remarkable book that should be read by anyone interested in the dynamics of the world's food security. — *Mike Duffy, Associate Director*

Considerable research has been done to show **what** farmers think and do to manage manure, but not **why** or **how**. Can a better understanding of farmers' considerations help lawmakers design better regulations?



Weighing in on the real choices farmers make



ISU sociologist Clare Hinrichs has worked on other Leopold Center competitive grant projects in the area of local food systems.

Farmer comment:
In the past, I definitely did not have a handle on what quality of resource I had. All the way back through my parents, you hauled manure on different areas of your farm knowing that you were giving a boost to the crop you would grow.

SURVEY

(continued from page 1)

Environmental Protection Agency reported in 1992 that one-third of all agricultural nonpoint source pollution in the United States can be traced to livestock operations. Manure management, once strictly a farm management issue, has become a matter of state and societal interest. Manure management plans are now mandated for Iowa farms with a threshold number of animal units in an attempt to balance manure nutrient availability with crop nutrient needs.

Considerable research has been done to show *what* farmers think and do to manage manure, but not *why* or *how*. In what ways do farmers weigh and combine economic, cultural, agronomic and technical considerations in managing manure as they do? Do farmers view manure as a resource or a waste product for their individual system? Can a better understanding of farmers' considerations help lawmakers design better regulations?

These were some of the questions Clare Hinrichs and Tom Richard wanted to answer in their Leopold Center-sponsored project on factors that affect farmers as they make manure management choices for their operations. Richard, an Iowa State University agricultural and biosystems engineer, explains why he thought this was vital: "Technical specialists sometimes see farmers doing the 'wrong thing,' and fail to appreciate the larger, sometimes complicated context of these decisions and practices."

Hinrichs, an Iowa State University sociologist, conducted in-depth, semi-structured interviews with 34 Iowa swine producers farming in the Raccoon River or Iowa River watersheds. The sample group included producers with swine operations of various sizes and orientations, using liquid or solid manure systems common in Iowa (i.e., pit or slurry storage,

anaerobic lagoon, open lot, pasture systems or hoop structure). Hinrichs found that the farmers she dealt with were concerned about how economic changes in the swine industry were affecting their individual operations and the overall environmental performance of the industry.

Flying in the face of research and regulatory assumptions that often classify farms by a single manure management system, 25 of the 34 farmers used more than one manure handling and storage system. Eight of the farmers had strictly solid systems, 11 had liquid-only systems, and 15 used both liquid and solid manure systems. With nearly half the farmers reporting use of a combination of liquid and solid systems, Hinrichs cautions against adopting design or education solutions based on farmers handling *only* one or the other.

Manure: waste or asset?

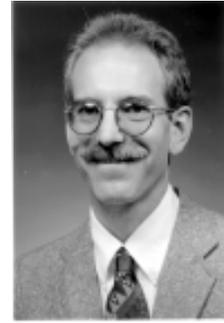
Farmers' attitudes toward manure are multifaceted and more contradictory than the simple waste vs. resource argument would suggest. Farmers recognize the economic benefits of substituting manure for commercial nitrogen, but many retain negative views about this practice. Their ambivalence toward manure centers on how the odor problems and the labor required to handle manure detract from its value to their farm. However, some farmers viewed manure as an economic resource and option for sales via new manure markets. (These are markets where specialized livestock farmers provide a product—manure—to specialized crop farmers.)

Many factors contributed to the swine producer's decisions about which manure handling systems to employ. Hinrichs notes, "The accounts of these farmers show that manure management decisions are actually farming system decisions. Farmers simply do not make

Some candid comments from farmers:

Manure's just the by-products that they have to deal with from hog production, which theoretically should be a resource, too, and is... But it's also a real pain in the neck, which makes its value as a resource a lot less. Because you have to handle it.

I think the one thing that we have problems with more than anything is just plain storage. I mean that's probably the big part of any manure system, whatever you have. If you have pits, you have earthen lagoons, or you just, like we do over there, compost it. You still got to have a place to put it. And it's there and you've got to do something with it eventually.



ISU agricultural engineer Tom Richard also works with the Leopold Center's hoop group research team.

to manage livestock manure

these decisions in isolation from other aspects of their enterprise or lives.” Things that can affect manure management decisions include historical precedents on the farm, individual and family preferences and values, economic constraints, environmental concern, neighbor relations, integrator policies and a changing state regulatory climate.

When Hinrichs asked farmers about things they did to protect water quality, several common themes emerged. The first three practices were cited, irrespective of whether farmers used liquid or solid manure systems, or both:

1. Attention to place, or *where* one applies manure,
2. Attention to time, or *when* one applies manure,
3. Attention to *how* one applies manure (i.e., solid or liquid, incorporation or not) and
4. Attention to mitigation or monitoring systems (i.e., filter strips, tile sampling, etc.)

Environmental attitudes

Overall, swine producers in these two Iowa watersheds do not have homogeneous “mental models” of their watersheds. There were three ways of thinking about watersheds: in engineered or bureaucratic terms, in hydrologic terms (focusing at either the farm or regional level), and in socio-ecological terms. While their comprehension of the watershed concept varied, most farmers remained genuinely concerned about water quality. Many of them expressed frustration at the difficulty of reconciling contradictory environmental and management recommendations for manure handling.

Farmers from all types of operations agreed about the growing importance of water quality protection on their own farms, but they held sharply differing views about the actual environmental impacts of large-scale, intensive livestock agriculture. Most farmers, however,

asserted that urban sources of water quality problems are as important, if not more significant, than any agricultural sources. While the distinction between solid and liquid manure is important from a management standpoint, it did not play a role in the level of environmental concern expressed by the farmers.

Hinrichs and Richard found that farmers did seem to be shifting from a waste perspective to a qualified resource perspective regarding the use of manure on their farms. Increased knowledge, new technical applications and manure market expansion were stimulating the transition to a resources viewpoint.

Designing better systems

The tension between the needs of environmental protection and enterprise profitability still keep many farmers from pursuing options that they might otherwise prefer. Farmers want solutions that satisfy both of these needs. Richard says the study found that “the ideal management systems must fit both the farm’s unique physical characteristics, and the farmer’s unique personal preferences and motivations. In many respects, the environmental or economic performance of a technology may be less important than the comfort and satisfaction the farmer feels with it.”

Hinrichs adds another caveat to those who are writing environmental regulations for manure handling. “One-size-fits-all solutions provide an attractive, seemingly rational approach for regulators, but are contrary to the realities of livestock production and manure management systems.” She and Richard stress the need for a systems perspective on the part of regulators, and encourage certification training beyond land manure applicators to those who manage manure prior to application.

Farmer comment:

One of my concerns is that if we don't make money...people end up starting to cut corners. ...so we need to make money to be good stewards. I mean, we would love to be good stewards of the land and so on, but sometimes economics drives us to maybe cut corners where we shouldn't.

John Pesek (center) talks with agronomy graduate students (from left) Terry Loecke, Adam Davis, John Kost and Alison Carpenter.

In retirement, John Pesek continues to prod others in their journey toward sustainable agriculture.

“Sustainable agriculture does have a future – it is either that or we humans have no future.”



Popular prof blazes trails in sustainable agriculture

By Laura Miller
Newsletter editor

When Iowa State University agronomy graduate students first talked last spring about having a campus discussion on sustainable agriculture, their natural choice was to involve retired distinguished professor John Pesek. Naming what they hope will become an annual on and off-campus event after him seemed logical.

Their biggest hurdle was convincing Pesek. He could think of many others “more deserving” of the recognition for their contributions to sustainable agriculture.

Graduate student Adam Davis thinks not.

Davis remembers reading *Alternative Agriculture*, a book published in 1989 by a National Research Council committee chaired by Pesek, then agronomy department head at ISU. Now considered a landmark study, the report documented how farming systems that used fewer pesticides, fertilizers, antibiotics and fuel could be productive and profitable. It also was controversial.

“I was an undergraduate in biology at Yale, thinking that my contribution to agriculture would be creating GMOs,” Davis recalls. “But the more I learned, the more I realized I might be creating problems with technological fixes. This book showed me there might be another way.”

Davis didn’t know about Pesek’s role in the book until he came to ISU a decade later to pursue a graduate degree. Pesek’s office was next door.

“When I found out he had chaired the editorial committee for the report I wasn’t surprised,” Davis says. “He considers issues carefully and doesn’t go with the easy answers. He was at the center of a mainstream institution (ISU), coming out with ideas that really questioned commonly-held approaches in agriculture. It is his integrity, vision and moral courage that makes him such an exciting influence for me.”

Colloquium sparks wider discussion

Davis and others who planned the John Pesek Colloquium on Sustainable Agriculture March 1-2 in Ames and Decorah want to do more than honor a beloved professor and unique individual. They want to encourage a wide-ranging discussion

of sustainable agriculture and the risk-taking approach that Pesek brought to his career.

Leopold Center director Fred Kirschenmann read the *Alternative Agriculture* report in 1989, then heard Pesek speak three years later to a group of North Dakota farmers.

“I don’t know if they were ready to hear what he had to say,” Kirschenmann recalls. “To many farmers at the time, technology was the silver bullet that would help them out. I think Pesek realized that science can sometimes bring you to wrong conclusions so he used 14 case studies to show that other things can work on farms. The report legitimized what a small group of farmers had been trying to do.”

Lorna Michael Butler, the Henry A. Wallace Endowed Chair for Sustainable Agriculture at ISU and the colloquium’s major sponsor with the Leopold Center, said she appreciates Pesek’s perspectives. His speech, “From a Trail to a Path to Sustainable Agriculture,” considers how agriculture has triumphed and failed, calling sustainability the “central issue for the human race.”

Leading others on a personal journey

One of his students and now an agronomy faculty member, Mary Wiedenhoef, agrees that sustainability is important, but coming to that conclusion often involves a personal journey.

“I was educated at ISU in the late 1970s when big was best,” she said. “When I went to graduate school in the Pacific Northwest, I would get letters from home saying, ‘Well, today we still own the farm.’ I began to wonder what’s going on economically and in our lives that would cause a pretty good farmer, my father, to be nervous about ownership of the land and the future.

“We believed in conventional agriculture but we soon learned that in order for us to continue we couldn’t go down the same path,” she added. “All of us have gone through that, and Dr. Pesek has helped many people get started on this transition.”

Pesek minimizes his role.

“There’s a time for everything. When the time comes for something to happen, the person who’s put on the firing

PESEK

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I believe that sustainability of an agriculture that is environmentally benign in relation to world resources, population and the environment is a serious issue, perhaps the central issue for the human race.

— Dr. John Pesek

ISU C.F. Curtiss Distinguished Professor

Pesek's simple definition

PESEK

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line will probably execute it well,” he explained to a group of graduate students gathered outside his office. He said it was “a stroke of luck” that brought him to ISU in 1950, and then to head the agronomy department in 1964, a position he held until 1990.

His research has been nationally recognized for contributions in soils, fertilizer, crop fertilization and the economics of fertilizer use. He has served terms as president of both the American Society of Agronomy and the Soil Science Society of America.

Yet, people who've never heard of sustainable agriculture understand Pesek's very simple definition: “Sustainability is doing the right thing at the right time for the right reasons.”

More on Pesek and his ideas

The 1989 book, *Alternative Agriculture*, by the Committee on the Role of Alternative Farming Methods in Modern Production of the National Research Council, is available from the National Academy Press, <<http://nap.edu>>.

The following quotes come from Pesek's March 1 lecture. The text also can be found at the Leopold Center's web site and in a commemorative brochure available from the Henry A. Wallace Endowed Chair for Sustainable Agriculture, (515) 294-6061.

“Farming represents a unique relationship of food and fiber producers to the rest of society. Farmers, by producing all the food and fiber needed, freed society to pursue other activities of civilization. In return for use of its sovereign territory, society has high expectations of the farming community.”

“We have ignored the real cost of our applied technology at the farm level because we have not had to pay for the consequences, and society at large has not fully determined nor assessed this cost, nor has been willing to pay more for alternatives. After all, the upland farmer does not directly pay for the cost of dredging the Mississippi River or reimburse the loss of Gulf of Mexico fisheries, nor does the farmer in north central Iowa have to worry about nitrate removal from river water used for drinking in Des Moines.”



Leopold Center seeks input on initiatives

New ways of thinking about agriculture must involve public policy and economic practices, a better understanding of local ecosystems, new markets for Iowa farmers, and partnerships with consumers.

These ideas are the focus of a proposed trio of initiatives that members of the Leopold Center staff take “on the road” this spring in a series of “community conversations” and other meetings throughout Iowa. What they hope to gain are ideas and comments about direction for Leopold Center activities over the next several years.

“We believe that agriculture in Iowa can support families on farms, contribute to a healthy environment and maintain vibrant rural communities,” says Leopold Center director Fred Kirschenmann. “But agriculture, land and food do not operate in a vacuum. That's why we want to get a ‘reality check’ from as many audiences as possible about our proposed plan. Is this the direction we should be going?”

Kirschenmann and staff are presenting the plan at facilitated discussions March 5 in Mt. Pleasant and March 19 in Decorah. Other discussions were scheduled Feb. 13 in Sioux Center and February 27 in Hiawatha near Cedar Rapids. The plan will be a session topic at the annual meetings of the Wallace Center near Lewis on March 12 and the Neely-Kinyon Farm near Greenfield on March 20. Kirschenmann also will share his thoughts on the plan when he speaks to a number of other organizations this spring.

People interested in participating in the “community conversations” are asked to contact the Leopold Center to make sure meeting space is adequate at each location.

A page on the Center's web site includes the proposed plan of activities, *Building a new agriculture for Iowa*, and other information about the year-long visioning process. To receive a printed copy of the plan, contact the Center.

Last April, the Leopold Center Advisory Board began discussing future directions for Center programs. In July, Kirschenmann convened a one-day forum to talk about “big picture” issues in agriculture. Staff will work this summer to compile comments, revise the proposal and possibly plan a regional meeting that would reach a broader audience. The Center has obtained a grant from the Cavaliere Foundation to pay for visioning activities.

What do you think?

How should the Leopold Center focus its activities in the future? We'd like to hear from you! Offer comments via the Center's web site, <<http://www.leopold.iastate.edu>>, or by calling the Center at (515) 294-3711.

Biotechnology: It's time to talk — Part II

EDITOR'S NOTE: In our last issue we suggested that biotechnology is among new areas of knowledge that stand apart from previous human ventures into science and technology. We called for an inclusive discussion about the use of this technology and suggested that universities could play an important role. In this article we follow up on these thoughts.

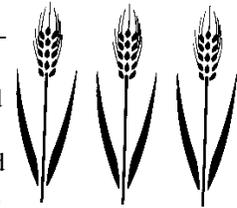
By Jeri Neal
Grants coordinator

Everybody hears about biotechnology, a lot of people are talking about it, and we at the Leopold Center say that well-reasoned, well-informed discussion about it is critical. But exactly what we are talking about?

As one of our readers pointed out about our first piece on biotechnology, it's difficult to have a reasonable discussion unless everyone agrees on a starting point. The Royal Society of Canada notes that "one of the most important questions involved in the assessment of the potential hazards of these products and techniques is that of how they differ, if at all, from traditional means of modifying the genetic character of organisms."

Definitions of biotechnology cover the gamut: anything from crossing two varieties of peas to rows of cover crops to the most extreme experiments in genetic manipulation. The primary agencies of industry and government have chosen intentionally broad definitions. For example, the U.S. Department of Agriculture defines biotechnology as "a collection of scientific techniques, including genetic engineering, that are used to create, improve or modify plants, animals and micro-organizations." Industry leader Monsanto thinks of biotechnology and the genetic enhancement of agricultural

products as one of the oldest of human activities. At the other end of the spectrum, scientists in the field distinguish between all manner of biotechnologies, including cell and tissue culture, protein engineering, recombinant and non-recombinant DNA techniques.



We suggest, as a starting point for conversation, that when lay people use any number of biotech terms—biotechnology, genetic engineering, genetic modification, GE, transgenic foods, and/or GMO—they are referring to the use of non-sexual processes to transfer genetic materials between species.

Given a starting point, we need to have somewhere to move. The dialogue needs to be opened. Dr. Walt Fehr, director of the Office of Biotechnology at ISU, agrees. Fehr notes that Iowa State University, home to the 14-year-old Bioethics Program that has been funded by the Office of Biotechnology, is well positioned to take the lead on this issue.

Fehr notes that an additional motivation for dialogue is a recent grant from the USDA that provides for a four-year multi-state study of the social, economic and ethical aspects of agricultural biotechnology. "Iowa State University is committed to bringing together the appropriate constituents for a meaningful dialogue," he writes. "The time is right."

The Center plans to work with Dr. Fehr and other interested faculty to set the stage for what Center director Fred Kirschenmann calls a "well-reasoned and respectful" discussion of the issues surrounding the adoption of this rapidly-evolving technology.

No dates have been set, but we'll keep you posted via local media and the Leopold Center web site.

New resource

One of the most comprehensive reports about transgenic crops is now available from the Henry A. Wallace Center for Agricultural and Environmental Policy at Winrock International. The report, *Transgenic Crops: An Environmental Assessment*, was written by researchers at Portland State University, Michigan State University, Clarkson University, a Canadian Commission on Environmental Cooperation and the University of Maryland. The 81-page report is available at <<http://www.winrock.org/transgenic.pdf>>, or by calling Winrock International, Arlington, Va., (703) 525-9430.

In the public debate ...

News reports about biotechnology may be oversimplified, but increased media coverage also can be an opportunity for better understanding and discussion of complex issues.

Eric Abbott, an Iowa State University professor of journalism and mass communication, has studied how major newspapers in the United States and abroad have reported stories that deal with genetically modified crops. He found that certain events – reports of StarLink corn found in taco shells or a study on the effects of Bt corn pollen on Monarch larvae — trigger a flurry of news stories. He also found that over time, the role of scientists and industry in the public debate over GMOs declined,

while citizens' groups had reasonably high access to mass media. Newspapers also relied on farmers as news sources after a trigger event.

Abbott said some of the changes in the way a story is reported in the mass media occur when a topic becomes a social issue, rather than a scientific issue. The first stories about GMOs appeared in the business section of newspapers and have since moved to the front page. At the height of news coverage nearly a year ago, there were three times as many stories in British newspapers compared to newspapers in the United States.

Newspapers often are studied because research shows that people tend to get a lot of their scientific information from mass media.

Nearly a decade ago it seemed logical for Jed Becker to turn his father's small Holstein herd out to graze in a pasture that once had been planted to corn.

But logical didn't mean familiar for this Winneshiek County farmer. Becker estimates that 80 percent of what he did was new to him as he set up a grass-based dairy near Cresco in northeast Iowa. Now there's a growing group of producers who consider grass-based dairies a profitable alternative to traditional methods.

Grass-based dairies use a rotational grazing system in which cows are pastured April through November. Cows are moved daily from paddock to paddock, and alfalfa and oats are added to typical crop rotations. The system works well in areas marginally suited to row-crop production.

"I have read about rotational grazing used in New Zealand," says Becker, a 1976 Iowa State University graduate in farm operations. "It really made a lot of sense to me. With our rolling topography in northeast Iowa, a lot of our landscape shouldn't be used for row-crop production anyhow. So I went to meetings to learn more about it."

Now he speaks at meetings, hosts pasture walks and participates in a grassroots citizens group to share what he's learned with others. Becker is a member of the board of directors for the Northeast Iowa Community-Based Dairy Foundation, which last fall opened a new 156-acre dairy laboratory near Calmar. The group has joined forces with the local community college, Iowa State University Extension, the ISU colleges of agriculture and veterinary medicine, and the ISU experiment station to help train the next generation of dairy farmers.

"In two years, we hope to be set up for an entirely grass-based dairy demonstration," Becker said. "The herd will be all Jersey, which generally do very well."

Unlike other grass-based dairy producers, Becker uses pastures that are tillable. He farms 240 acres and sells any grain that he doesn't need for silage. The result has been a top-producing herd, says ISU Extension dairy specialist Wendy Powers.

Powers worked with Becker during a Leopold Center research project that focused on grass-based dairies. She wanted to know how much more manure is produced by cows fed a less-digestible grass diet, compared to those on conventional mixed rations. Samples were collected from 10 cows in Becker's herd and another herd in central Iowa over a two-year period. She found that the summer grass-based diet resulted in 50 percent more manure than the winter diet of mixed rations, but it had a lower nitrogen and phosphorus content.

Becker said he was glad to help out with the study, and that it reinforces his beliefs that grass-based dairy systems can be sustainable. He said they are a fairly low-cost operation, and are suited for farmers who want to enter the organic market. Some day, he added, northeast Iowa's hilly countryside might be as valuable as the lush, emerald meadows of New Zealand.



Becker, his dog Pepper and the Holstein that he's named Minya Konka.

An Iowa apple a day

A Leopold Center report on apples is the focus of a new Iowa State University Extension publication and educational presentation.

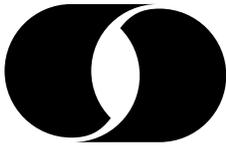
Iowa-Grown Apples outlines the advantages of eating locally-grown apples and tells how to find Iowa orchards that sell them. The fact sheet from Iowa State University Extension is based on a 1999 report by Leopold Center education coordinator Rich Pirog and Center intern John Tyndall that tells the story of how Iowa once was a leading apple-producing state. They use apples to explore the potential of local food systems and agricultural diversification in Iowa.

Apples also are used in an educational presentation by ISU Extension nutritionist Betsy Schafer and nutrition assistant Oksana Matvienko. The presentation is designed to help consumers understand how their choices between locally grown or "imported" apples influence local communities, the environment and the family food supply.

The fact sheet (PM 1863) is available from any county extension office or can be viewed online at <<http://www.extension.iastate.edu/Publications/PM1863.pdf>>. The presentation is available to local groups by extension specialists who work in nutrition and related areas. Several secondary school teachers also have requested the fact sheet and lesson for use in their classes.

NEWS & NOTES

Practical Farmers of Iowa presented the Sustainable Ag Achievement Award to **Dave Williams** of Villisca during the group's annual winter workshops in Ames. The group noted Williams' commitments to family farming, soil stewardship and leadership in the sustainable agriculture community. He is the current chair of the Leopold Center Advisory Board and a longtime board member.



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CALENDAR OF EVENTS

Community Conversations for future Leopold Center activities (multiple locations and dates). Contact the Center to make reservations, (515) 294-3711.

March 5—Mt. Pleasant

March 12—Wallace Center, Lewis (community conversation will be a session during the annual meeting). Contact: Jill Euken, ISU Extension, (712) 769-2600.

March 19—Decorah

March 20—Neely-Kinyon Farm, Greenfield (community conversation will be a session during the annual meeting). Contact: Kathy Rohrig, ISU Extension, (641) 743-8412.

March 5-7—Agriculture and the Environment: Water Quality Issues for Iowa, Scheman Building, Ames. Contact: ISU Agribusiness Ed Program, (515) 294-6429.

March 10—Marketing Organic and Identity-Preserved Grains, Ionia. Contact: Matt Maker, NE Iowa Organics Assn., (319) 387-0947.

March 21-23—Small Farms Conference, Springfield, Ill.

Contact: Margaret Smith, ISU Extension, (515) 294-0887.

March 22—Squaw Creek Watershed Protection Workshop, Ames. Contact: Erwin Klaas, Story County SWCD, (515) 382-2217.

May 10—Iowa Children's Water Festival, DMACC, Ankeny. Contact: Shannon Quinn, Iowa Assn. of Water Agencies, (515) 323-6299.

July 17-19—Tri-State Grazing Conference, Dubuque. Contact: Larry Tranel, ISU Extension, (319) 583-6496.

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

Iowa CAFE (Community Agriculture Food Enterprises) local food system and direct marketing workshops (multiple locations and dates). Contact: Robert Karp, Practical Farmers of Iowa, (515) 232-5649.

SW Iowa: May 8—Wallace Foundation for Rural Research and Development, Lewis

SE Iowa: June 13—Johnson County Fairgrounds, Iowa City
NW Iowa: June 14—Buena Vista University, Storm Lake

NE Iowa: June 20—Upper Iowa University, Fayette

Central: June 21—DMACC, Ankeny

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