

Letter

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All eyes on energy: Frequently asked questions about the Chariton Valley Biomass Project



EDITOR'S NOTE: The following article was adapted from information prepared by Marty Braster, Chariton Valley Biomass Project coordinator.

November marks the first test firing of coal and switchgrass at Alliant Energy's Ottumwa power plant. There are high hopes for successful burning of what proponents hope will become Iowa's newest cash crop and source of renewable energy: switchgrass.

Cash-crop status for this warm-season grass native to southern Iowa, *Panicum virgatum*, may be years away, but the Chariton Valley Biomass (CVB) Project has generated a lot of information, interest and hope in recent months. The Leopold Center plays a small but important part by providing the education and outreach funds for

this huge effort. The project began nearly a decade ago and now involves scientists from two universities and more than two dozen public agencies and private organizations, nearly 100 cooperating producers, a major utility, plus politicians, conservationists and educators.

The project is coordinated by the Chariton Valley Resource Conservation and Development (RC&D) in Centerville. Rathbun Lake is located in the middle of the project area, which includes Appanoose, Lucas, Monroe and Wayne counties.

The goal is to produce 35 megawatts of biomass-derived electric power at Alliant Energy's (formerly IES Utilities) generating station in

SWITCHGRASS
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Biotechnology: It's time to talk

As we go to press, we are awash in biotechnology news and reviews. From the recent World Food Prize to StarLink corn and monarch butterflies, biotechnology has been a front-page story.

At the Leopold Center, our primary interest in biotechnology is related to its fit with sustainability in agriculture and food systems. And we are certain that the polarization of opinions about this technology means that a lot of important questions are not being asked or even discussed.

Our namesake Aldo Leopold gives us this advice: "The first precaution of intelligent tinkering is to keep all the parts." Leopold's "intelligent tinkering" would require not just molecular biologists, corporate CEOs, regulators and policymakers, but all of us. Listening to everyone is important—possibly critical—because biotechnology is among a new era of highly democratic tools, which once employed, cannot be called back. The role our land grant

BIOTECHNOLOGY
(continued on page 4)

Listening sessions planned throughout Iowa

Grant helps Leopold Center continue vision work

The Leopold Center's look at the future of agriculture is taking a concrete turn with recent new developments.

The Center has received a \$30,000 grant from the Cavaliere Foundation to help Iowans develop a dynamic vision for agriculture and the Center's role in that future. The grant will be used to host several "listening sessions" throughout Iowa, and to engage people from a variety of groups in those discussions.

More information about the listening sessions will be announced in the near future. The Wisconsin-based Cavaliere Foundation was recently created to promote the preservation and conservation of the nation's ecological health.

"The environmental, social, ethical and spiritual issues facing agriculture are enormous," said Leopold

Center director Fred Kirschenmann. "Without a clear vision that once again transforms agriculture to a public good, we could well see the demise of agriculture and the end of farms, farmers and rural communities as we have known them."

Kirschenmann said the discussion in the sustainable agriculture community about these issues must first address core values. Such a discussion also must restore respect and an awareness of interdependency among producers and consumers in the food system.

Center programs also are being examined as part of the visioning effort. At their September meeting, members of the Leopold Center Advisory Board agreed that a portion of the funds normally awarded to competitive research grant projects should be reserved for future projects that work

toward a new vision. The Center received 70 preproposals for competitive grant projects. The Board recommended 18 preproposals for full consideration, and five preproposals are receiving further attention from Center staff.

Center staff and board members also are reviewing responses to a survey about outreach and the Center's conference and workshop program.

From the Cavaliere proposal:

Agriculture desperately needs a compelling new vision that reshapes itself as a public good, captures the public imagination, and rekindles public support. The sustainable agriculture community has taken the first small steps toward rekindling such public support.

NEWS & NOTES

Leopold Center director **Fred Kirschenmann** spoke in November during the Wisconsin Academy of Sciences, Arts and Letters fall forum, "Genetically Modified Food: Risks, Rewards & Realities," in Madison. He joined a publicist, corporate agronomist and university public policy analyst on a panel discussion about the environmental benefits and concerns of biotechnology.

* * *

Several Iowa farmers, the **Leopold Center**, Practical Farmers of Iowa, and a number of other sustainable agriculture organizations were featured in the September 2000 issue of *The Furrow* magazine, "Sustainable Agriculture is Turning More Heads." Producer Dick Thompson of Boone described the sustainable agriculture movement as "agriculture's quiet revolution," and "a peaceful, yet dynamic, transition that constantly challenges us to find better ways to farm."



LEOPOLD CENTER

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

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

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U.S. Vietnam Era Veteran. Any persons having inquiries concerning this may contact the Director of Affirmative Action, 318 Bearshear Hall, (515) 294-7612.

How many farmers will we “need”?

As recently as last year, mainline newspapers were still editorializing about the United States having “too many farmers.” Their case, as usual, was based on the simplistic notion that if one or two farmers can produce all of the raw materials for the food and fiber we need, then it must be inefficient to have more than that in the farm economy. It is usually inferred that this is the reason farmers are going broke. It’s just like over-employment at a factory. When you have too many people in one enterprise, you must downsize.

Steven Blank at the University of California has taken this logic to its rational conclusion: the United States should get out of farming altogether. If farmers in developing countries can produce raw materials cheaper than we can, we should import these products and concentrate our energies on higher value enterprises. “It’s not a bad thing,” he suggests. “This is life in a competitive world.”

Using the farmer/eater ratio

We can’t blame the news media for coming to similar conclusions. The U.S. Department of Agriculture and mainstream farm organizations have, for almost a century, used the farmer/eater ratio to gauge the success of industrial agriculture. In the 1930s, one farmer “fed” only himself and three other eaters. The same farmer now “feeds” well over a hundred people. As the argument goes, this demonstrates the efficiency of our industrial farm/food system.

This equation ignores the fact that most farmers don’t feed themselves anymore and many rely on food stamps just to feed their families. More importantly, this argument dis-

regards increased energy and capital needed to fuel modern agriculture. It also fails to recognize labor needed to process, package and transport food to eaters, which was not part of the 1930s food system. When these costs are added to the equation, other efficiencies disappear. Our food system may be efficient, but using the old farmer/eater ratio to judge the efficiency of our farms is flawed.

Using a calorie formula

These flaws have been recognized. For more than a decade, David Pimentel at Cornell University has used a calorie formula to determine overall food system efficiency. He consistently has found that when we calculate all of the energy required to get food from the soil to the table, industrial agriculture doesn’t fare very well. Most of industrial agriculture uses about 10 calories of energy to produce every calorie of food that we eat. Local food systems that use less processing and packaging fare much better.

Every credible study of on-farm performance that I have seen shows that mid-sized farms, not mega-farms, are the most efficient. But even those studies don’t give us a good picture because they measure efficiency only in terms of production; they do not consider other contributions that farmers make to our common good.

The upshot of all this is that we haven’t had a serious discussion about how many farmers we really will need to meet our overall national goals. It’s easier to take the simplistic view that farms are food factories. Then we can determine farm size and population



Farms as food factories or communities?

from the single perspective of how much raw material, food and fiber are being produced.

In the most recent issue of *World Watch* magazine, Brian Halweil gives us a comprehensive view of the role that farmers play in our society. The farm, Halweil argues, “is still the one link in the agrifood chain accounting for the largest share of agriculture’s public goods—including half the world’s jobs, many of its most vital communities, and many of its most diverse landscapes. And in providing many of these goods, small farms clearly have the advantage.” The reason local farmers play such a crucial role in providing these additional benefits—which are hardly ever calculated in our economic efficiency models—is that farmers “are professionals with extensive knowledge of their local soils, weather, native plants, sources of fertilizer or mulch, native pollinators, ecology and community.”

Contributing to community

With respect to the contributions that smaller farms make to local economic and social stability, Halweil points to the well-known William Goldschmidt study. He surveyed two communities in California and found that smaller farms in a community made a much more positive contribution than did larger farms.

Halweil also asserts that modest-sized farms are critical for local ecological stability. Smaller farms, whose operators may have fewer time

DIRECTOR

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Contact the Leopold Center for a copy of Brian Halweil’s essay, “Where have all the farmers gone?” For more information, write the World Watch Institute, 1776 Massachusetts Ave. NW, Washington D.C. 20036, or visit their web site, <<http://www.worthwatch.org>>.

Study: Full-time prisoners outnumber farmers

DIRECTOR

(continued from page 3)

constraints, tend to maintain greater diversity than larger operations, which makes them more resilient and productive. We know that sound ecological management cannot be carried out through centralized planning. Every ecological neighborhood is unique. People need to live on the land long enough and intimately enough to learn how to manage each neighborhood in an appropriate way.

Halweil points out that we now have more full-time prisoners than full-time farmers in this country. Farmers over 65 outnumber those under 35 by three to one, and Nebraska and Iowa are expected to lose an additional one-third to one-fifth of their remaining farmers within the next two years. Surely, it is

time to reexamine the prevailing notion that all we need to do to make farming profitable is to get rid of a few more farmers, fuse the remaining producers into corporate value chains through contracts, increase the U.S. share of the export market, and further enhance our production technologies.

It is time for us to reassess the impacts of our industrial agriculture model. If we decide, as a society, that we do not need the additional common "goods" that farmers produce, and that all we expect from farms is as much corn, soybeans, wheat, rice, cotton and meat as possible regardless of the social and environmental costs, then we can reduce the number of farms and farmers, and we can reasonably entertain the possibility of getting this country out

of the farming business altogether.

At the Leopold Center, we want to make these issues part of our discussion to fashion a new vision for agriculture for the 21st century. We don't have the answers but we want to raise the questions. We have been fortunate to receive a grant from the Cavaliere Foundation to take these and other agriculture-related concerns into Iowa communities. Together we hope to envision a more resilient and robust agriculture that will better serve Iowa's farmers, rural communities and economy.

We invite you to read Brian Halweil's essay, "Where have all the farmers gone?". We believe Halweil's piece can bring fresh insight to our discussions.

NEWS & NOTES

ISU animal scientist **Palmer Holden** presented results of a Leopold Center-funded research project during a two-day Alternative and Herbal Livestock Health Conference in October at the University of Connecticut. Holden studied the effects of various levels of peppermint, echinacea and garlic used in rations fed to 12-week-old pigs. The feeding trials ended this year.

* * *

Agriculture can enrich anyone's education, according to teachers who completed a one-week **Teachers' Academy on Ag Awareness** at Iowa State University last summer. The course is offered by the ISU Department of Agricultural Education and Studies with Center staff leading some sessions. "I am very much committed to the concept of getting people on the land and getting away from the giant companies' influence," wrote one longtime sixth-grade teacher. "I was impressed by the materials from the Leopold Center and the ideas about using local products in school lunch programs. That will be worth sticking my neck out to try and get something going."

This debate needs all voices

BIOTECHNOLOGY (continued from page 1)

universities could play is important, a golden opportunity to engage constituents. We need to work together for ways to bring the public into the discussion thoughtfully and respectfully, and to establish a much needed "safe" place for debate.

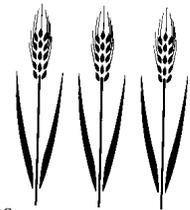
The time has come to talk – and in a manner which we've seldom seen or tackled in this country. Dismissing the general public because we may think they lack scientific background or because they do not subscribe to "proper" protocols is not engagement. All voices should be heard and issues thoughtfully debated.

Here are some questions to open the discussion:

- Where can markets provide sufficient guidance for the use of biotechnology? Or can we only ensure the technology's best use (the most public gain with least public risk) through regulatory control?
- Who owns the technologies and products in question? What are the implications for further technological advances?

- What problems is biotechnology best suited to address?

- How do the proposed technologies rate on a scale of minimal to extreme, both good and bad, in their geographic, social, biological, and magnitude of potential impact? Are there less risky alternatives?



Finally, with respect to the role of science in this debate, science is not limited to the sole pursuit of proving things step by step. Science can embrace the search for a universal explanation or theory, a description of the nature of things that seems to be missing in current conversations.

Let's not wait for hindsight to decide if this technology—biotechnology—is the next revolution, the next problem or simply another substitution for the last overused toy. We have the tools to assess and guide this new technology, and we all have a voice. All the voices need to be heard. —*Jeri Neal, Grants coordinator*

A journey in search of our future

Earth Odyssey

Mark Hertsgaard
Broadway Books, 1998
372 pp., \$36.95

This book came to me as a gift from Fred Melcher, who was dying of bone cancer. A journalist and activist, he was greatly impressed by the environmental message of *Earth Odyssey*. His concern for the future of the world that his 12-year-old daughter would inherit led him to purchase 20,000 copies of the book to be distributed to activists, teachers and policymakers. I was one of those fortunate people to receive a copy.

The book's author—who has written several books and teaches writing at Johns Hopkins University—took a unique approach, too. The book is the product of a wandering, nearly decade-long voyage that took Mark Hertsgaard to 19 countries to better understand the environmental health and future of planet Earth. As he made plans to travel the globe, he shared his ideas with a good friend and literary advisor William Shawn, a former editor of the *New Yorker* magazine. Shawn encouraged him, pronouncing it “the most important book anyone could be writing.” Unfortunately, Shawn died early in the author's world travels.

Wars, drought, famine

Hertsgaard found China to be a vast country with 1.2 billion people that encourages rapid economic development. He observed a nation with five of the world's 10 most air-polluted areas. In Africa, he visited large cities with growing populations. Wars, drought and famine brought people to already overcrowded towns, where one of every 11 infants will not survive their first year of life.

He traveled by boat, bicycle,

horse, foot and train, especially in Africa and China. People in many countries considered owning a car one of their highest priorities. Hertsgaard compares this desire to his addiction to cigarettes, and sees the automobile as having the greatest effect on the industrial age. This section of the book challenges us to redirect our complex but manageable efforts, and force the automobile industry to contribute to a cleaner, improved environment.

Hertsgaard attended the 1992 Earth Summit in Rio de Janeiro, where he felt there was no serious discussion and the United States was not a committed participant. “The American way of life is not negotiable,” he overheard one U.S. official say during the summit.

Political unrest

He also was in Russia when Mikhail Gorbachev was replaced. Hertsgaard saw how Russian cities had decayed, the plight of its people and unbelievable damage to the environment. He also spent time in Thailand where the huge population of Bangkok is operating with almost no sewage system.

The chapter, “How Populations Matter,” should be required reading if you're concerned about the environment. Hertsgaard reminds us that the world's population has doubled in the last 40 years, but that industrialized nations in western Europe and North America consume the most energy and natural resources. But what stuck with me was this quote from Cornell professor Dave Pimentel: “Soil erosion is arguably our single greatest environmental hazard because 99 percent of human needs come from the land.”

I am most impressed with the research that went into *Earth Odyssey*. Hertsgaard traveled at his own expense and saw firsthand the people and our fragile environment of land, air and water. He studied and read widely, quoting E.O. Wilson, Wendell

Berry, John Muir and many others. He also interviewed Václav Havel, Al Gore and Jacques Cousteau. Most importantly, his writing shows that he cares greatly for our planet.

In the final chapter, Hertsgaard gives the reader his vision of a cleaner, more friendly environment. He also describes his plan, the “Global Green Deal,” that points out opportunities amid the crisis.

I see two principal reasons for hope. First, most people want to do right by the environment and if given the chance, they will as long as they are not penalized economically for it. Second, far from being enemies, economic and environmental health can reinforce one another. In fact, if humans are smart, repairing the environment would become one of the biggest businesses of the coming century – a huge source of profit, jobs and general economic well-being.

The dictionary defines odyssey as “an intellectual or spiritual wandering or quest.” In that respect, Mark Hertsgaard found his purpose and sets us all out on our own journey. Aldo Leopold would have agreed with many of the conclusions made in the book, and that we have a lot of repair work ahead of us. But even the biggest journeys start with the first step. – Dave Williams, Leopold Center Advisory Board member and farmer, Villisca



Dave Williams

Aldo Leopold would have agreed with many of the conclusions made in the book: we have a lot of repair work ahead of us.

Photos courtesy Chariton Valley Biomass Project

Harvest usually begins after the first hard frost in October. The least costly production system has been frost-seeding on grassland.



A switchgrass primer: Putting the focus on fuel



Does switchgrass hold promise for southern Iowa's economy?

John Sellers, Jr. has been growing switchgrass for nearly 20 years.

Read his story on page 11.

SWITCHGRASS

(continued from page 1)

Ottumwa. Replacing five percent of the coal at the power plant would require 200,000 tons of biomass every year and involve as many as 500 farmers.

Researchers at Iowa State University and the University of Iowa are studying ways to improve agronomic practices and environmental benefits associated with producing and using switchgrass and other grasses for biomass. In addition to the fuel possibilities, Prairie Lands Bio-Products, Inc., a group of switchgrass growers in the area, is leading efforts to develop products and markets derived from the plant, such as its use as a filler in resins for plastics, ethanol, fiberboard, mulch and firewood logs.

As might be expected, people who hear about the Chariton Valley Biomass Project have many questions. Here are answers to a few of the most frequently asked questions.

1. What are the CVB project's goals?

The goal of this current phase is to demonstrate the technical feasibility of producing and burning switchgrass with coal to produce electricity. For the past 10 years, utilities in Denmark have been using cereal grain straw, similar to switchgrass, with coal as a fuel to produce energy. Several Danish engineers are technical consultants in the Iowa project.

The long-term goal is that switchgrass and other grasses become commercially viable sources of renewable fuel to co-fire with coal to generate electricity.

2. What about economic feasibility? Can farmers make a profit growing switchgrass?

Farmer profitability is a key issue. Farmers must receive a price greater than their costs of production if they are even going to consider switchgrass. Because biomass production is

relatively new, farmers also must receive extra compensation or be assured of a market.

The project includes a study that estimates costs of production. It shows that the two most important factors are yield and land cost. Yield depends on the variety, weather and other environmental factors, and further research should help lower the cost per ton by producing higher yielding varieties.

The estimated cost to produce switchgrass ranged from \$48 to \$132 per ton, depending on the type of production system used. The cheapest method involved high yields (6 tons per acre) using frost-seeding on grassland. Low yields (1.5 tons per acre) using spring-seeding on cropland resulted in the highest costs of production.

Currently, fossil fuel sources of energy such as coal are much cheaper than switchgrass. But it is difficult to determine how much switchgrass will be worth to replace coal because evaluations do not include environmental benefits such as wildlife enhancement. Other project efforts are directed toward developing markets that offer a premium for electricity generated from biomass, tax credits for the use of biomass as a fuel, and opportunities for landowners to produce biomass on land enrolled in the Conservation Reserve Program (CRP).

3. What other barriers exist?

By-products from the coal-burning process represent major markets, such as coal ash as an additive for cement and concrete. The ash generated during biomass co-firing does not meet specifications for this use. Representatives of the coal fly ash industry are investigating the characteristics of fly ash produced from co-firing biomass to determine its suitability for use in cement and concrete. New specifications also are under review by the U.S. Department of Energy (DOE).

SWITCHGRASS (continued on next page)

Modifications at power plants that allow biomass co-firing may trigger the need for new air quality permits or costly air pollution control equipment. So far, research shows that using some biomass with coal most likely will reduce the emission of air pollutants at power plants. Alliant Energy is working with the Iowa Department of Natural Resources (DNR) and the U.S. Environmental Protection Agency (EPA) to monitor changes in emissions associated with co-firing biomass.

4. Why was switchgrass selected?

The U.S. DOE and Oak Ridge National Laboratory's Biofuels Feedstock Development Program have identified switchgrass as a model herbaceous energy crop for several reasons. It is native to North America and adapts to a wide range of climates and soils. It has a dense root system that traps nutrients and filters pesticides and herbicides, which protects water supplies. Switchgrass also can be used as forage for livestock and as wildlife habitat.

In terms of its quality as a fuel, switchgrass has a relatively high energy content, comparable to that of wood, and is well-suited to co-firing with coal. Its sulfur and nitrogen contents could result in lower sulfur dioxide and nitrogen oxide emissions than coal, and it is capable of producing high biomass yields with relatively low inputs.

5. Isn't switchgrass hard to establish? How is it managed for biomass production?

Cooperating producers and the project field coordinator oversee more than 4,000 acres of switchgrass, and have learned many ways to improve establishment and management of this crop. In general, the use of frost seeding, relatively high rates of pure live seed per acre, and early season weed control have contributed to improved switchgrass establishment. They also hope to show the benefits of combining the production of a corn crop during the initial year of switchgrass.

The use of fertilizer varies with soil, yield and time of harvest, but has commonly included at least 100 pounds of nitrogen per acre and maintenance rates for phosphorus and potassium. Some work has been done to grow legumes with the switchgrass crop as a source of nitrogen.

Harvest typically begins after the first killing frost in October when the grass moisture content is 15 percent or less. Yields can be 30 percent greater at this time than if harvest is delayed until later in the winter or spring.

6. What other biomass is under study?

The biomass project's focus has been on the development of switchgrass and other grasses common in southern Iowa. The relative abundance of cool-season grasses such as reed canarygrass (*Phalaris arundinacea*), smooth brome (*Bromus inermis*), orchardgrass (*Dactylis glomerata*), and tall fescue (*Festuca arundinacea*) in southern Iowa has generated interest in their use as biomass.

7. Are there other industrial uses for switchgrass?

Project partners are conducting research and development activities in the areas of biomass gasification for energy generation, production of ethanol from lignocellulosic feedstocks, and the blending of biomass with petrochemical resins for use in the manufacture of plastic products.

8. Who is involved in this project? Where do the funds come from?

Currently, more than two dozen public and private organizations have contributed to the Chariton Valley Biomass Project. The project's utility partner is Alliant Energy. Producers are represented by the biomass growers' organization, Prairie Lands Bio-Products.

Research is being conducted by ISU and the University of Iowa. In addition to these partners, principal sources of funds and in-kind contributions for the project include John Deere Works, Iowa DNR, Iowa Division of Soil Conservation, Iowa Energy Center, Iowa Farm Bureau, Oak Ridge National Laboratory, Soil and Water Conservation Districts, T.R. Miles Technical Consultants, U.S. Department of Agriculture, U.S. DOE, Vermeer Manufacturing, and E.L. Woolsey and Associates. The Leopold Center is the primary source of financial support for information and education activities.

9. What else is happening in this project?

The November co-firing was the first of three co-fire test campaigns at the Ottumwa power plant that will continue through 2003. The switchgrass harvested this fall will be used in the 2001 co-fire test. Research related to the agronomic practices and environmental benefits of producing and using switchgrass and other grasses is ongoing.

The project has gained the attention and support of elected officials. In August, the project hosted a regional conference on carbon sequestration.



For more information,
write or contact:

Chariton Valley RC&D
19229 Highway 5
Centerville, IA 52544
(641) 437-4376;
<[http://www.cvr.cd.org/
biomass.htm](http://www.cvr.cd.org/biomass.htm)>

ISU Extension also has
two publications:

- Management Guide for the Production of Switchgrass for Biomass Fuel in Southern Iowa
PM 1710
- Switchgrass Seeding Recommendations for the Production of Biomass Fuel in Southern Iowa
PM 1773

Author says the cost to consumers to address social and environmental costs could be lower than expected.

Small can be profitable, too



Michael Shuman

While locally-grown foods continue to make occasional headlines and banquet menus, a nationally known author and economist encourages Iowa groups to take the next big step: to support locally-owned corporations.

The Leopold Center, Iowa State University's Vision 2020 program and the Wallace Chair for Sustainable Agriculture sponsored a two-day visit to Iowa by Michael Shuman in September. He is author of the 1998 book, *Going Local: Creating Self-Reliant Communities in a Global Age* (now available in paperback from Routledge), and co-directs the Village Foundation's Institute for Economics Education and Empowerment based in Alexandria, Virginia.

"We are in a peculiar time in American history where business calls the shots," Shuman said. "This can be a barrier to social change, but it also provides an opportunity to get things done."

Shuman shared his recent work with the Chesapeake Bay Foundation to create a community-owned chicken processing business, tentatively called Chesapeake-Friendly Chicken. He estimates that the venture could produce a natural broiler at a 25 percent higher cost than mainstream choices but it could be sold at a 50 percent higher price. The business would operate by the following principles:

- The voting shares of the company will be held exclusively by people living in the Chesapeake Bay watershed.
- Stakeholders, including factory workers and growers, will help make decisions by holding seats on the board.
- Higher quality La-Belle Rouge chickens will be grown and processed with air-chilling, both of which improve taste.
- Returns to farmers will be three times those now working under contract with conventional processors, which should pull them above the poverty line.
- The company will maintain high environmental standards (e.g., all manure will be composted and no longer flow untreated into the Chesapeake watershed).
- Labor standards will be improved for line workers through, for example, slowing down the processing lines.
- All of these principles will be locked into place by ensuring that the by-laws cannot be repealed without a 75 percent majority vote.

If the business succeeds, Shuman argues, Chesapeake-Friendly Chicken will show how a business with its stock held by the community can raise social and ecological standards and still be profitable.

"The cost to consumers to address social and environmental

COMMUNITY

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This harvest is about more than just an apple crop

Leopold grant helps program put people back on the land



by Laura Miller
Newsletter editor

Thirty-two adults with autism are living out Aldo Leopold's land ethic. Their involvement began in the spring of 1998, when they helped plant 360 dwarf apple trees in a new organic orchard near Runnells in Polk County.

For the past three seasons they have helped care for the young orchard. During a drought they watered trees, bucket by bucket, before an irrigation system was installed. They hand-picked armyworm caterpillars from branches, and hung small weights to help limbs grow correctly. They also mulched, weeded and spread compost week after week. In September, they finally picked their first crop.

The apple harvest was successful. More importantly, these adults, some of them with severe disabilities, learned about self-respect, pride and being part of a community.

"Everyone can do something here," says Janna Bouwkamp, vocational coordinator at The Homestead, a residential facility for autistic adults where the orchard is located. "It's exciting for them to be able to pick an apple off the tree and take a bite out of it."

Orchard also contributes to CSA

The orchard is part of Homestead's occupational program that includes a greenhouse and five-acre garden. Twenty-two residents and 10 other adults enrolled in Homestead's day program help raise about 40 kinds of fruits and vegetables that are eaten by the residents, sold in Homestead's General Store, and distributed to 16 families that belong to the Homestead Community Supported Agriculture (CSA) project. The orchard was established with a three-year \$22,000 competitive grant from the Leopold Center and with funds from Prairie Meadows Racetrack and Casino.

"We've been able to fill a niche market with the organically-grown apples," Bouwkamp explains. "It also goes along with who we are because working on the land is therapeutic. People can be part of an entire process from planting the trees, weeding and watering, to eating an apple when it's ready to pick."

According to Bouwkamp, many vocational programs for people with disabilities involve repetitive indoor tasks. These tasks often involve just one part of a manufacturing process, such as counting nuts and bolts, and workers do not see a finished product. On the other hand, agricultural work takes people outdoors, involves a number of different tasks,

HOMESTEAD ORCHARD

(continued on next page)

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



Tending organic orchard teaches self-respect, pride

HOMESTEAD ORCHARD

(continued from previous page)

and can be adapted for a wide range of abilities. Workers often eat the finished product right from the tree or vine, so “we plant plenty,” Bouwkamp adds, smiling.

Sustainable agriculture a good fit

Steve Muller, executive director of the six-year-old residential facility, says the Leopold Center grant was a perfect fit for Homestead.

“People with disabilities should have the option of living and working on the land, just like the rest of the population,” Muller says. “Our mission is to help people with autism develop personal growth in an agricultural setting.”

Autism is a neurological disorder that impairs how a person gathers and processes information, causing problems in communication and social skills. It is diagnosed in about one in every 500 people, and often involves other disabilities, such as mental retardation.

“Residents take great pride in the orchard,” adds Geoffrey Abelson, an ISU education professor who helped write the grant. “It gives them respect, integrity and a sense of place. Their families know they’re involved with something productive. People come here to buy apples because they’re good and they’re organically grown, not just because they were raised by people who have autism.”



About Homestead Orchard

Staff and residents at The Homestead worked with several departments at Iowa State University to make the organic orchard a reality. They include ISU’s first specialist in organic agriculture, Kathleen Delate; horticulture professors Paul Domoto and Gail Nonnecke; horticulture consultant Linda Naeve; and curriculum and instruction professor Geoffrey Abelson. Academic advisor Al Campbell also offered suggestions for education and outreach activities.

The orchard contains 360 dwarf disease-tolerant varieties, Redfree, Liberty and Jonafree. The first harvest was sold at five retail stores in Ames, Des Moines and Altoona.

Researchers are using the orchard as an outdoor laboratory to determine effective fertility and pest management strategies that can be used by other apples growers. ISU horticulture students and students from Central College already have learned to prune and train young trees and have researched pest management options. An ISU marketing class used the orchard as a model to develop a marketing plan for organic apples.

In February 1999, The Homestead and ISU Extension hosted a horticulture therapy conference at the Des Moines Botanical Center for 120 health care professionals. Homestead executive director Steve Muller said he’s been asked to set up similar programs in Kansas City, Dubuque and Cedar Rapids, but says he hopes to focus efforts in Des Moines. He said he expects to double the number of autistic people in the program next year.

Homestead residents work in all areas of production from weeding, pest control, harvest, weighing, shining and bagging the finished product, sold at five retail outlets this year. Tasks are designed according to ability.

Sustainable ag gets academic home, Center boost

Seeds have been sown for a new graduate program in sustainable agriculture at Iowa State University beginning with the 2001-02 academic year.

Nearly 80 faculty, students and supporters gathered in September to celebrate what is believed to be the nation's first program to award master's and doctorate degrees in sustainable agriculture, approved by the Iowa Board of Regents in July. The event ended with a symbolic toss of seeds collected from 140 crops throughout Iowa, as well as five continents, to mark diversity of the new curriculum.

"This is what happens when a group of young, energetic faculty, students and members of the sustainable ag community coalesce and keep on pushing," said Lorna Michael Butler, who is the university's first Henry A. Wallace Endowed Chair for Sustainable Agriculture and whose office will provide administrative support for the program. "Very few programs bring together the biological,



physical and social sciences and the humanities like this one does."

Classes will be offered in ten departments: agricultural and biosystems engineering, agricultural education and studies, agronomy, animal science, anthropology, entomology, forestry, horticulture, plant pathology and sociology. ISU's status as the nation's first land-grant university

and its ties with sustainable agriculture through the Leopold Center, ISU Extension, ISU's organic horticulture research program and Practical Farmers of Iowa also have been cited as logical reasons to create the new program in Iowa.

The program begins with \$45,000 seed money from the Leopold Center, approved by the center's advisory board last summer. The money will be used with matching funds from the College of Agriculture to support a graduate student assistantship for up to three years. The advisory board asked that the assistantship be named the Leopold Fellowship.

The program has received similar support from several academic departments on campus. More information is available on the program's new web site, <<http://www.sust.ag.iastate.edu/gpsa>>, or by contacting the ISU Henry A. Wallace Endowed Chair for Sustainable Agriculture, 110 Curtiss Hall, IA 50011-1050; (515) 294-60561.

How friendly is business to your community?

COMMUNITIES

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costs turns out to be far lower than expected," he said. "For example, environmentally sound disposal of chicken manure is less than a penny a pound retail."

He argued that the business would have an incentive to press state authorities to raise labor and environmental standards for the industry.

One obstacle to creating efforts such as Chesapeake-Friendly Chicken is the lack of capital. Shuman suggested the creation of new venture capital funds that could support community-friendly businesses. Such funds could be capitalized with assistance from state, private, consumer groups and non-profit sources.

In *Going Local*, Shuman describes dozens of examples of successful small-scale locally-owned

businesses. These include credit unions, cooperatives, community land trusts, municipally owned utilities, small worker-owned firms, community development corporations and local shareholder-owned firms such as the Green Bay Packers.

"The only way communities can ensure their economic well-being is to stop chasing multinational firms with no community loyalties, and to start investing in community corporations," he writes. Locally-owned corporations are much more responsive to quality of life issues, workforce concerns and the environment.

He also suggested that self-reliant communities could encourage such community-friendly businesses by issuing a "Good Community Seal of Approval" and by offering more informal education in business leadership.

NEWS & NOTES

The Leopold Center's "hoop group" research team was featured in a report aired by the Canadian Broadcast network in October. Researchers **Don Lay** and **Mike Larson** also presented information at the Iowa Pork Industry Center's quarterly Market Analysis and Outlook program in September. It is estimated that four percent of Iowa hogs are raised in hooped structures.

* * *

Leopold Center advisory board member, farmer and community leader **Dave Williams** of Villisca was named as a 2000 Friend of Extension during Iowa State University Extension's annual meeting in October. He helped develop and carry out the vision for the Armstrong Research Farm near Lewis.

**He's
turning
heads
with
switchgrass**



Photo by Dan Zinkand used courtesy Iowa Farmer Today.

John Sellers, Jr. tends 520 acres in southern Iowa's roller-coaster landscape near Corydon in Wayne County. For him, the most pleasing scenes include cattle in a grassy paddock, and not the stalk and stubble-covered eroding hilltops of corn and soybean fields.

But Sellers is no dreamer. He's a realist who knows that what's best for this fragile landscape is grassland, more grassland than livestock will ever support. That's why he's been working for the last 20 years to help the land return to a crop that grew naturally here a century ago: switchgrass.

Sellers is president of Prairie Lands Bio-Products, Inc., a group of southern Iowa farmers who came together three years ago to develop new, sustainable markets from products derived from switchgrass and other native grasses. The association has 60 members who cooperate with the Chariton Valley Biomass Project. They hope to grow enough switchgrass that can be burned with coal to produce electric power and sell as value-added products.

Switchgrass for biomass, wildlife habitat

A longtime conservationist who has farmed in the area since 1970, Sellers has 80 acres of switchgrass in the Chariton Valley project. An additional 60 acres of switchgrass is set aside for wildlife habitat. Nearly half of his land is enrolled in the Conservation Reserve Program, but he and other farmers in the area have an exemption to harvest switchgrass for the Chariton Valley project. In addition to a commercial pumpkin enterprise, the only other crops he plants are corn, oats and hay for his small cow/calf operation.

"Switchgrass is a very sustainable crop," says Sellers, who has become a widely traveled spokesman for the project. "It has a massive root mass and it can weather lots of adverse conditions."

He admits that the economic incentive isn't there yet for switchgrass. "We're competing with coal that's mined in Wyoming and delivered to Ottumwa for \$15 a ton," he said. "That's a whale of a deal. We will need other incentives to make our switchgrass competitive."

In addition to the Chariton Valley project, for which he is a field coordinator, he also is president of the Iowa Forage and Grassland Council and vice-president of the Rathbun Land and Water Alliance. He was recently appointed by Governor Vilsack to the Iowa State Soil Conservation Committee. He has been invited on numerous occasions to testify in Washington on ethanol, biomass-derived energy and other topics.

His goal, he says, is to return Iowa to a forage-based economy.

"We need to look at all of the benefits of growing forage and native grasses," he said. "We may find that Iowa-grown energy is a bargain that can also help farmers and protect our soil, air and water."

**Report chronicles
'Seasons of Change'**

The Leopold Center underwent a metamorphosis of leadership in FY 2000, moving from a longtime founding director, to an interim leader, to a new chief executive. The story of the Center's evolution of leadership, coupled with updates about ongoing efforts in sustainable agriculture research, education and outreach, highlights the 1999-2000 annual report, titled "Seasons of Change."

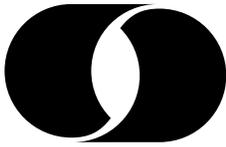
Though the lengthy resolution of the directorship situation clearly holds center stage, the report also details the work of the Center's three issue teams and two research initiatives, as well as special projects ranging from air quality, to the *A Sand County Almanac* anniversary giveaway, to watershed planning efforts. The Center's expanding food systems work merits special coverage, along with a wrap-up of the year's conference and workshop activities.

One-third of the annual report is devoted to recapping the work of the investigators in the competitive grants program—those embarking on new projects, ongoing work and projects that concluded their efforts at the end of the year.

The 36-page report is now available from the Center office. It was compiled and edited by Mary Adams, with graphic design by Juls Design of Ankeny, Iowa.

**News series highlights
nitrogen pollution**

A five-part series in the *Baltimore Sun*, "Nitrogen's Deadly Harvest," takes an extensive look at nitrogen pollution from industrialization, population growth and intensive use of chemical fertilizers. The last article explores possible solutions, and mentions the Leopold Center's Bear Creek buffers. Former Leopold Center director Dennis Keeney also is quoted. The series is available on the Internet at <www.sunspot.net>, or by calling (410) 332-6800.



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CALENDAR OF EVENTS

January 12-13, 2001 – PFI annual meeting, Ames. Contact: Nan Bonfils, Practical Farmers of Iowa, (515) 294-8512.

January 15, 2001 – Tri-State Development Summit, Macomb, Ill. Contact: Geode RC&D, (319) 752-6395.

Late January 2001 – Grazing Corn Residue Winter Field Days, near Armstrong Research Farm and McNay Research Farm (two sites). Contact: Brian Peterson, (641) 782-4218.

January 27, 2001 – Sixth annual Local Food System conference, Iowa City. Contact: Jan Libbey, Iowa Network for Community Agriculture, (515) 495-6367.

February 2001 – O'Brien County Ag Expo 2001, Sheldon. Contact: Karen Mitchell, O'Brien County Economic Development Corporation, (712) 757-1313.

February 22, 2001 – Grape-growing workshop (part of Iowa Fruit and Vegetable Growers annual meeting), Cedar Rapids. Contact: Mark Gleason, ISU Extension, (515) 294-9420.

February 24, 2001 – Cornbelt Cow Calf Conference, Ottumwa. Contact: Joe Sellers, ISU Extension, (641) 774-2016.

March 1-2, 2001 – John Pesek Sustainable Agriculture lecture series, Ames (and site to be announced). Contact: Lorna Michael Butler, ISU Wallace Chair, (515) 294-6061.

March 6-7, 2001 – Agriculture and the Environment: Water Quality Issues for Iowa, Scheman Building, Ames. Contact: Gerald Miller, ISU College of Agriculture, (515) 294-4333.

March 14, 2001 – Tri-State Grazing Conference, Dubuque. Contact: Larry Tranel, ISU Extension, (319) 583-6496.

March 20, 2001 – Neely-Kinyon annual meeting, Greenfield. Contact: Kathy Rohrig, ISU Extension, (641) 743-8412.

March 21-23, 2001 – Small Farms Conference, Springfield, Ill. Contact: Diane Mayerfeld, ISU Extension, (515) 294-1923.