

Summer 1990

THE LAND REPORT

Number 38



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Number 38

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(back cover)

PHOTOGRAPHS of Land Institute activities in this issue were taken by several interns and staff. Tamara Kraus and Kris Schaefer printed the photos in The Land's darkroom. Janine Calsbeek loaned us photos for her article.

SKETCHES : pgs. 19 & 21 by Tracy Noel; pgs. 22, 23, 26 by Jake Vail; pg. 12 by Todd Francis.

On the Cover

Holly Ewing, an intern, photographed this group during the Prairie Festival on a Wauhob Prairie walk led by Kelly Kindscher. The Land Institute protects this prairie remnant across Water Well Road under a fifty-year lease agreement with the owners, Bess and Lloyd Wauhob.

In This Issue—

Five interns (Kathy Collmer, Jean-Luc Jannink, Tamara Kraus, Paul Muto and Tracy Noel), two former interns (Janine Calsbeek and Colin Laird), and six staff (Berni Jilka, Tom Mulhern, Jon Piper, Jake Vail and Wes and Dana Jackson) contributed articles to Number 38. In addition, we published Todd Francis's letter of application to be an intern (page 10). Like the bounty of the summer garden praised in the poem by Thomas McGrath on page 36 (Paul Gruchow read this at the 1989 Prairie Festival), 1990 Prairie Festival stories, researched articles and descriptions of The Land's work and mission spill out of The Land Institute cornucopia in this issue.

Wes Jackson has written an important position statement about The Land's work to develop domestic prairies (page 29). It has been ten years since his book, *New Roots for Agriculture*, was first published. Janine Calsbeek's feature articles (pages 24-28) testify to changed attitudes and farming practices since Wes first developed the arguments for perennial grains grown in mixtures. He explains how The Land's concept of long-term sustainable agriculture differs from Low-Input Sustainable Agriculture.

THE LAND REPORT

is published three times a year by



2440 E Water Well Road
Salina, Kansas 67401

Editor: Dana Jackson
Asst. Editor: Jake Vail — Proofreader: Kathy Collmer
Arts Associate: Terry Evans
Circulation Manager: Sharon Thelander
Printed by Arrow Printing Company
on recycled paper

Contributing to # 38: Janine Calsbeek, Kathy Collmer, Todd Francis, Dana Jackson, Wes Jackson, Jean-Luc Jannink, Berni Jilka, Tamara Kraus, Colin Laird, Thomas McGrath, Tom Mulhern, Paul Muto, Tracy Noel, Jon Piper, Jake Vail,

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At The Land



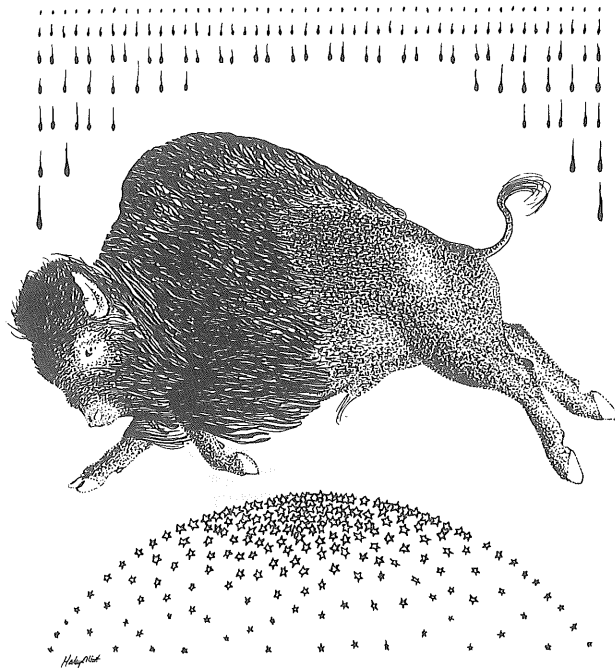
Land Institute Hosts Twelfth Annual Prairie Festival June 1-3, 1990



Crowd lines up Sunday noon for barbequed buffalo burgers catered by Gene Rebels.

Each year we celebrate the prairie ecosystem and prairie folk with a program that offers fellowship, learning, discussion and inspiration. The 1990 Prairie Festival, with the theme "The Future of Prairie Communities," attracted a record crowd. Some came to walk on the prairie with Kelly Kindscher, or hear Dwight Platt talk about the arid prairies, Jon Piper explain the role of fire on the prairies and Jim Hays talk about trees on the prairie. Others were particularly interested in hearing Frank and Deborah Popper present their controversial proposal to create a "Buffalo Commons." Still others looked forward to

Continued on pg. 8.



PRAIRIE FESTIVAL • 1990

The Future of Prairie Communities

Jean-Luc Jannink

Farm foreclosures pervaded the Great Plains during the 1980's. Speakers at this year's Prairie Festival, Deborah and Frank Popper and Marty Strange, looked into the Plains' past for the causes of these economic difficulties and toward the future to suggest guidelines for a more stable economic base upon which rural communities might sustain themselves. While the Poppers and Strange agree on the need for planning that takes into account the uniqueness of both the ecology and the people of the Plains, their interpretations of current economic conditions lead them to different recommendations for the future.

Deborah and Frank Popper spoke Saturday morning and Saturday afternoon to large audiences in the big barn. As they presented their work on the history, geography and economics of the Plains, it became clear that they work as a team. Deborah is a doctoral candidate in geography at Rutgers University in New Jersey. Frank, also at Rutgers, chairs the Urban Studies Department there. Their pooled expertise has led this couple to a vision for the Plains summed up in these words: Buffalo Commons.

The area studied by the Poppers stretches east to west from the ninety-eighth meridian (splitting Kansas roughly in half) to the foothills of the Rocky Mountains and north to south from Canada to Texas. Short grasses are the vegetation most adapted to this area with its low rainfall (generally less than twenty inches) and extreme seasonal and daily temperature variations. The Plains are sparsely populated. They make up one fifth of the land area of the continental United States and are occupied by one fortieth of its inhabitants. In addition, a major portion of this population inhabits the urban areas of the Plains.

Deborah Popper spoke about the history and geography of the Plains in her Saturday morning talk. Occupation of the Plains remained nomadic for over three centuries after initial exploration by the Spaniards in 1540. The Homestead Act of 1862 brought hopeful farmers from the East who split the Plains into 160-acre parcels. Many were uprooted by the droughts of the 1890s. Early in this century, indirect federal subsidies through the railroads again brought settlers who found a market for their products in a Europe torn by World War I. In the 1930s the Dust Bowl caused great migrations out of the Plains.

Frank Popper commented on these boom-bust cycles during his afternoon talk on the fate of the Plains: "As a nation, we have never understood that the federally subsidized privatization that worked so well to settle most of America west of the Appalachians is ineffective on the Plains. It leads to overbuilding and overproduction that cannot be sustained under the Plains' difficult economic and climatic conditions. It leads to what the great North Dakota historian Elvin Robinson called the 'too much mistake.'"

This mistake, he suggested, has been repeated in the past two decades. "There have been ups and downs during the '80s but mostly downs," said Popper. "The farm, ranch, mineral and energy economies have not strengthened, and land prices have not always rebounded."

Exacerbating the weak farm economy, American dietary preferences have moved from red meat to chicken and fish which the Plains do not produce. Bank failures, detrimental in themselves, have also caused the remaining banks to tighten their lending policies. Other trends bode ill. Soil erosion is as high as always and will eventually decrease the profitability of farming. Water shortages appear inevitable with the depletion of the Ogallala aquifer. The federally subsidized water provided in the past by dams and irrigation projects does not appear forthcoming in the future.

These physical factors are not the only concern. Population decreases are already stretching Plains communities to their limits.

"Largely because of outmigration from the Plains portions of Texas and Colorado, the population of these states as a whole decreased for the first time since the second World War," said Popper.

Though some counties have experienced population decline since the 1920s and even since the 1890s, the loss of the local doctor, bank, bus stop, or clergy signals the end of these communities.

According to the Poppers, the Plains' economy cannot survive without subsidies from other areas of the country. Frank Popper cited a U.S. General Accounting Office study showing that 60% of personal income in the Plains parts of some Plains states is of federal origin, mainly in the form of U.S. Department of Agriculture (USDA) subsidies. With the federal budget crunch, this fact weighs heavily on the future of the Plains. The Poppers predicted that those economic centers able to bring in external income will continue to prosper.

"These places have something—state capitals, tourism, marketing facilities—that will allow them to weather the storm that will hit extraction-based activities."

Some traditional farming, mining, and energy-based communities will persevere, but the Poppers foresee that eventually large parts of the Plains will revert to something like their pre-white-settlement condition. They will be deprivatized, or at least they will not stay in the traditional form of private land. The building blocks for this deprivatization are already there. Frank Popper cited two examples of land already outside of the private economy: land owned by the Bureau of Land Management in the form of National Grasslands, farmland that has been foreclosed and cannot be sold to any willing buyer (the Farmers' Home Administration and the farm credit system are already full of such properties). Some counties have succeeded in placing more than the legal limit of one fourth of their lands in the conservation reserve program: these lands could also become part of the commons. Finally, he pointed out, the Nature Conservancy has increased its activities in the Plains, and land conservancies might form additional building blocks.

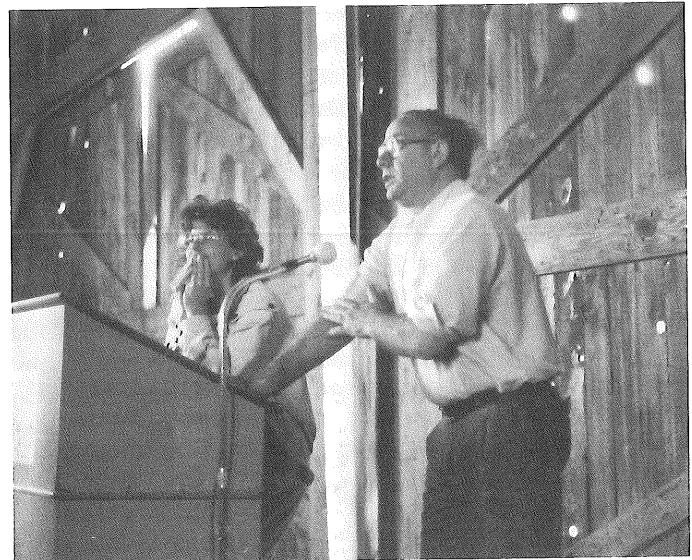
The strengths of the Poppers' arguments are undeniable. All of the resources which Plains communities have relied on to support their economies are in decline: soil fertility, water supply, fossil fuels, and population. To begin to plan a "Buffalo Commons", the Poppers have tried to predict which places are most likely to become a part of it. For each county in the Plains area of Plains states, they have looked at six "Land Use Distress" indicators defined as follows:

1. Long term population loss (over 50% since 1930)
2. Short term population loss (over 10% since 1980)
3. Low population density (less than four people per

- square mile, a density at which public services such as schools and health care become stretched)
4. High median age (above 35; the national median age is 30)
5. High poverty levels (20% or more of the population in poverty)
6. New construction less than \$50/person (the national average is \$850/person).

The Land Use Distress analysis shows numerous counties in difficulty. However, these counties are not always contiguous. In addition, each county potentially contains economically healthy farms. These problems point toward what the Poppers agree is the largest unknown: what kind of regional planning could bring about a Buffalo Commons? Land Use Distress indicators focus on economic factors rather than on physical-geographical factors which might determine an actual carrying capacity of the different areas of the Plains. The economic organization of a region influences the carrying capacity of that region, but this organization remains flexible. A planning commission empowered to move towards a Buffalo Commons might also be empowered to reshape the economy of the Plains so that, in Deborah Popper's words, we might find "distinct ways of living more carefully and lightly on the Plains."

With the current forms of agribusiness, the carrying capacity of the Plains is very low, so low the Poppers would argue that a threshold has been passed below which human settlement is impossible. This view, however, begs the question: Are other agricultural and economic structures on the Plains possible that allow a carrying capacity high enough for the economic and social needs of Plains dwellers to be fulfilled? This, I believe, is the question the Center for Rural Affairs, Walthill, Nebraska, seeks to answer through its work.



Deborah and Frank Popper

Marty Strange, co-founder and co-director of the Center for Rural Affairs, addressed this question on Sunday morning at the Prairie Festival. He began from a position diametrically opposed to that of the Poppers: federal subsidies do not work to stop the depopulation of the Plains. In fact, the shape of the subsidy programs causes depopulation. The subsidies have ushered in an agricultural structure that has reduced the carrying capacity of the Plains to its current low.

Strange's vision of an agriculture that would satisfy both economic and social criteria starts with the people of the Plains. They are a self-sufficient people, used to doing things for themselves. Strange used statistics from a study published by the Center for Rural Affairs in 1990 to back up this profile.* In farm-based counties (in which over 30% of the jobs excluding service and retail are in production agriculture), 42% of all workers are self-employed and generate 48% of all income. These percentages are three to four times higher than percentages in metropolitan areas the Center studied.

Strange also asserted that the people of the Plains have the opportunity to help themselves out: "To a greater extent than most places, the people here still have ownership and control over the resources that are close to them."

In addition, he said that we know what kind of agriculture to move toward. "Despite the fact that we don't farm as well as we know how, we do know how to farm better than we do."

Strange went on to contend that knowledge is not used because USDA subsidies encourage farmers to ignore it: "The USDA programs reward farmers who farm more and more of the same crop. By diversifying, a farmer can lose a half to two-thirds of program benefits." Such programs work to the detriment of self-reliant farmers.

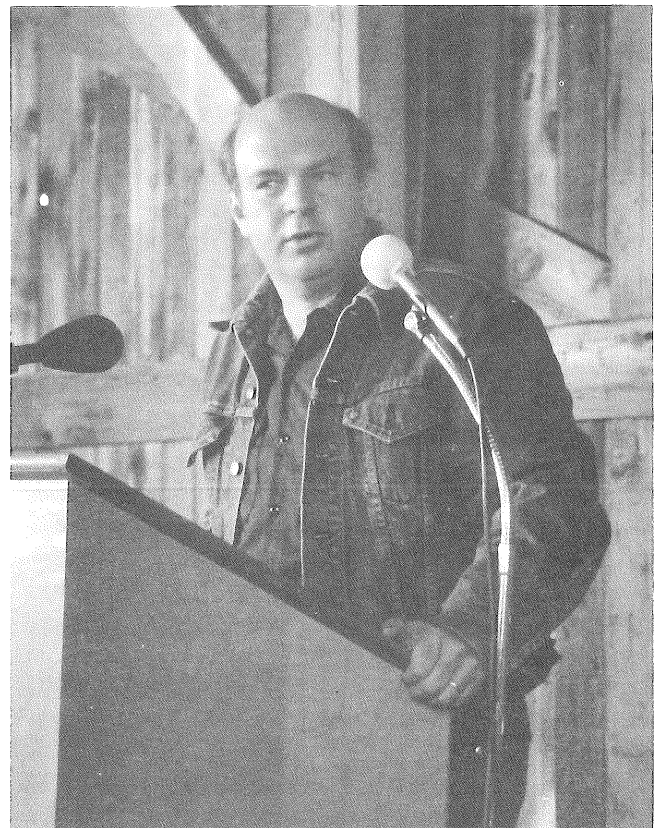
Tax laws have also benefited corporations more than individual producers. Strange cited laws in Nebraska which reduce taxes on ventures creating a number of jobs at once. In order to pay for these tax subsidies, the government had to raise taxes on everybody else, including those self-employed people who benefit in no way from the subsidies. These laws do not suit the needs of the rural Plains with its high rate of self-employment. Jobs are preferentially

created in metropolitan areas and we observe the ongoing rural exodus.

Through these influences, rural areas have become part of what Strange called a "dealer\broker\agent" economy which, he said "is designed to introduce imported inputs, in the form of machinery, chemicals and capital, and extract unprocessed grain." The statistics he cited were impressive: compared to 1940, farmers now spend three times more on purchased inputs, four times more on machinery, seven times more on short-term loans and ten times more on long-term loans. As a result, despite a gross income that has doubled, net income has decreased 10% and is more poorly distributed than ever: two thirds of it goes to the top 5% of the producers.

Strange's concept of economic development is to rectify this distribution "by integrating the whole economy locally and finding ways for many people to make a good living not just on production agriculture but by supporting a complete system that makes good use of the land." Only such an integration can achieve "the full potential of sustainable agriculture."

Strange's vision of the Plains is one in which people work in harmony with their harsh environment. The Poppers vision of the Plains is that of "the largest natural and historical preservation park in the world," in which people look on an awesome but forbidding landscape from without. Perhaps the Great Plains is large enough to contain both visions.



Marty Strange

**Half a Glass of Water: State Economic Development Policies and the Small Agricultural Communities of the Middle Border.* The Middle Border in this study includes several states in the Great Plains area studied by the Poppers. It also includes parts of Missouri, Illinois, and Wisconsin, which are not Great Plains States. The Center for Rural Affairs looked at the economic development policies of six states that embrace 277 counties whose economy is essentially agricultural and generally troubled.

Storyteller Delights Festival Participants

Tamara Kraus

There was a strong Kansas wind blowing across the orchard where early Prairie Festival arrivals gathered around the traditional Friday night bonfire. The forceful gusts fed the flames with extra vigor, and the crackling of the burning wood accompanied the sound of the nearby tents flapping in the wind. People sang and talked in small groups until the clear, beckoning voice of Louise Anderson introduced a tale—appropriately, a ghost story. The listeners settled down around the fire and anticipated the unfolding tale as firelight flickered over Louise's wide eyes and waving hands. Her voice slowed and sped, rose and fell, to draw us all into the scene of an isolated wooden cabin inhabited only by an old man and his two dogs, soon to be visited by a strange and scary creature. Thus began the 12th Annual Prairie Festival.

Louise Anderson, storyteller from Jacksonville, North Carolina, was a special addition to this year's program. Wrapped in colorful cloth, Louise stood out prominently among the casually clad Prairie Festival participants. Along with her multicolored dresses and exotic turbans, she travels everywhere bedecked with jewelry which clinks warmly as she moves. Beaded necklaces, bracelets, rings, and her notable large, round brass earrings depicting the African continent add to the special aura that surrounds her—an aura of wisdom that breathes history, knowledge and the passage of time. In addition to these physical possessions, Louise is equipped with an open smile, a hearty laugh and deep, expressive eyes.

For the past decade Louise has been working with the North Carolina Community Colleges' Visiting Artists Program. Through this program she gives workshops, performances and class appearances and is available to tell her stories for all kinds of organizations. She has performed in pageants and movies and wrote and directed the film "Lest We Forget," a portrayal of the life of Dr. Martin Luther King. Her career developed when she worked for RIF (Reading Is Fundamental), a national organization that encourages reading among children who live in poverty. Louise explains that stimulating children's interest in stories through storytelling can ultimately encourage them to read more on their own.

Louise Anderson calls herself a *Belen-Tigui*: in the Mandingo language *belen* refers to the tree stump planted in the middle of the public square upon which orators rest when speaking, and *tigui* means "master of." Thus together these words mean Master of Speech. In this case, being a Master of



Louise Anderson

Speech requires not only a skillful grasp over language, but also the art of presentation. In her "Guide to Storytelling" Louise points out the need for variation in the volume, pitch and speed of voice. Also, resonance and depth are key to a quality sound. The storyteller must be continually aware of the audience and lead listeners through the tale by emphasizing important words and phrases. Motion is another essential component of the art; both hand movements and facial expressions keep even fidgety children focused. Louise herself has perfected these skills: her deep, confident voice with its rich Southern Black accent weaves vivid images around her listeners.

Louise has a seemingly endless collection of stories that she can fit in appropriately for different occasions and settings. They include all types—fairy tales, ghost stories, legends, myths, fables, tall tales, riddles and oral folklore—and she continually acquires new ones to relate. Her stories contain heroes and heroines, witches and wizards, talking animals and walking trees. She explains that after she tells a story four or five times she then has a complete version of it.

While Louise's stories are absorbing and entertaining, that is not their sole purpose. Louise

sees storytelling as an important tool for communication and learning. One of her main goals is to pass on history from generation to generation. She feels that children in particular should be more aware of their heritage. Throughout her stay at the Land Institute Louise challenged people to tell their own stories and to ask parents and elders to relate stories of their own. She pointed out that in order "to go forward we must know the things that have happened." This includes the bad as well as the good; it is important that children are not led to believe that things have always been perfect.

Louise strongly believes that every person possesses important stories and has contributed to history in some way, no matter how seemingly insignificant. Storytelling offers a very personal means of communication, as individuals can share what they remember from the past and offer their own interpretation of events.

Louise knows that memories are selective, and they often cloak the truth. But, she points out, "there is no True Truth." She illustrates this point with a short story about a man who goes to seek Truth—an old, ugly woman with a beautiful voice—and finds her high up on a mountain. After learning from Truth for a year and a day, he departs. "Tell everyone that I was young and beautiful," Truth requests.

While many of Louise's stories are historical, others are fictional but contain important messages. She tells African stories from her own heritage in order to "pass on certain truths."

Louise sees storytelling as a means of bringing people together. "People are more alike than they are different," Louise softly stated. "With this realization much strife can be eliminated from the world." Many of her stories draw people together by touching common emotions, by having different people laugh and cry together. She tells ethnic stories to educate people about various other peoples' histories and traditions and to show the commonalities that connect all races and nationalities. One of her favorite ethnic stories, which she told on Saturday evening at Prairie Festival, describes the forced march of the Cherokees, referred to as the Trail of Tears. In the story Louise stresses that the tears that fell were not shed by the Native American Indians who suffered so greatly, but rather by those who saw them pass and cried at the horror that they witnessed.

Louise's stories also attempt to open people up to important concepts. "Ideas and dreams can change the world," she stated with assurance. One story she told at Prairie Festival described a place on Lake Uganda where "the only law was the law of love," and peace flourished.

Hearing Louise tell stories was an experience that all who attended the 1990 Prairie Festival will long remember.

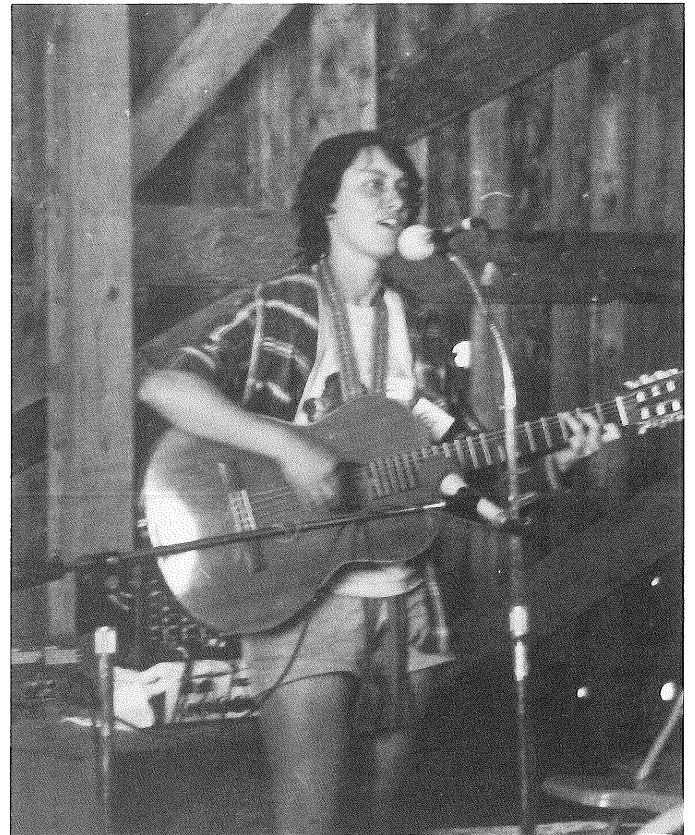
Continued from pg. 3.

Sunday morning's program on "Reviving Farm Community Economics," featuring Marty Strange of the Center for Rural Affairs, and Susan Witt and Bob Schwann of the E. F. Schumacher Society. Paul Nachtigal's talk about the place of public schools in rural development and a special panel discussion moderated by Deanne Wright on "Learning a Sense of Place" added another dimension to the theme.

Music lightened up the seriousness of speeches and discussions. Audiences enjoyed the Irish music of Sean O'Hare and Frank & Chris Martin; a moving performance by Jim Scott, singer and guitarist; favorite Anni Zimmerman Prairie Festival specialties, "Bad Attitude Blues" and "Homegrown Tomatoes;" and a pleasing folk sound new to the Festival from 1990 intern Kris Schaefer. The Saturday Night Land Band, a group of superb Kansan musicians with dance caller Mike Rundle kept everyone dancing in the barn on Saturday night until the wee hours.

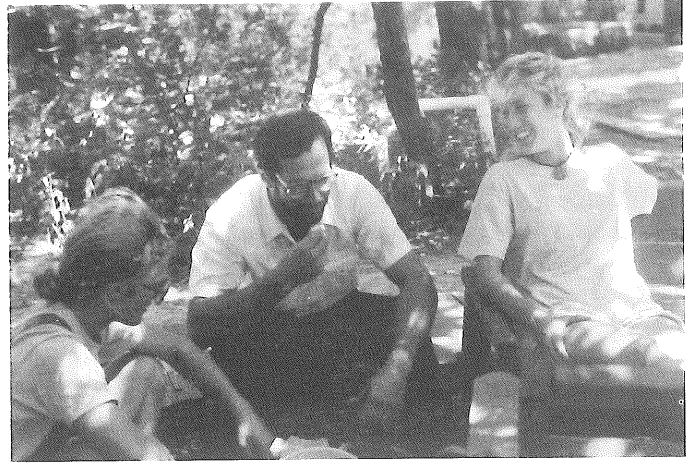
Storytelling by Louise Anderson and an art exhibit with American Indian motifs by Chris Musgrave, Baldwin, Kansas, surprised and delighted participants.

The Prairie Festival received national attention this year as a result of Noah Adams and a sound crew from National Public Radio. They recorded Festival activities and interviewed Land people for an "All Things Considered" program aired on August 6.



Kris Schaefer

Summertime--



And the Livin' is Easy

...for awhile.

After a long morning, Kris, Judy, Tracy, Jake, Tamara, Jean-Luc, Beth, and Paul (and Bobbins) relax after lunch (above). Judy, John, and Jean-Luc share smiles. But we hear that rain is in the forecast, so it's back to work, harvesting potatoes (right).



The Land's Harvest Cooperative

Jake Vail

The Land's Harvest Cooperative was formed this spring to tend and sell three perennial crops which were planted in 1989: asparagus, strawberries, and raspberries. A steering committee of four leads the coop. We leased the land from The Land Institute, obtained tax papers and insurance, and opened a bank account. With little experience in growing the three crops, little familiarity with each other, little business acumen, but big hopes, we eagerly awaited the growing season.

We didn't have to wait long. Spring sprung, and while many coop members were organizing Salina's Earth Day celebration, asparagus spears shot skyward. We scrambled to the field, and on April 22 harvested sixty pounds to sell at the Earth Day festivities in Oakdale Park. In the weeks that followed we picked much more.

After the asparagus season we regrouped to organize ourselves for the imminent strawberry explosion. We established operating procedures for

the U-Pick, ordered cartons, built carriers, weeded, advertised, arranged our work schedule, and dreamed of strawberries and cream, strawberry shakes, strawberry cheesecake, jam, ice cream, crepes, and strawberry-rhubarb pie.

Rain slowed the ripening, but we picked for Prairie Festival and sold out. The next weekend was Salina's Smoky Hill River Festival. The Prairieland Food Cooperative picked 100 quarts for shakes and daiquiris sold in their concession stand, The Oasis. We opened the U-Pick to the public.

Vagaries of weather and fluctuations in the numbers of pickers made operations unpredictable. On a Sunday we might be picked clean, but by Friday face an overwhelming surplus. Panic sometimes set in when berries rotted because enough pickers didn't come, but all in all the strawberry season went well. In three weeks we sold close to 2,500 quarts.

Now we weed the asparagus and longingly eye the raspberries.

Todd Erik Francis

October 5, 1967

June 15, 1990

Walker Visionary

Todd Erik Francis was a 1990 intern. We enjoyed working him in the experimental plots and garden, listening to his ideas in the classroom, and singing with him as he played his guitar. Todd took his own life on June 15. We miss him. With his family and friends, we held a service by the river on the evening of July 5 to remember Todd, then walked to the highest point on The Land's property and spread some of his ashes on the prairie near a red sandstone boulder that bears his name.

During his internship at The Land Institute, Todd became known in the Salina community for living his convictions. He helped plan and carry out Earth Day activities and encouraged high school students to organize a bike ride down Salina's main street, Santa Fe Avenue, to call attention to the waste of gasoline in the ritual of "cruising the Fe." He also helped organize and present a compost demonstration for The Land at the Smoky Hill River Festival.

After graduating Phi Beta Kappa from Grinnell College in 1989, Todd spent several months in Spain, where he wrote his letter of application to be an intern at The Land Institute. He answered the questions we ask all applicants, but in a particularly creative manner. To share our memory of Todd, we are printing his application essay in this *Land Report*.

I have a shirt. Stained wine pink and purple at the shoulders in some ancient tie-dyeing ceremony. We have lived together the past six months. But it is fading. Common, undershirt whiteness is replacing its stains. Fortunately, it is also developing irreversible holes, worn spots, and a stretched-out shape that I could certainly identify in a runaway undershirt line-up.

The most unfortunate loss, however, is the disappearance of the drawing that used to trace the front of the shirt. My brother drew it for me so I could wear it during college graduation last May. A large tree, branches stretched out, curved back inside the borders of the cloth frame. Two branches wound in the middle, cradling a guitar, picking out a song on its strings.

The drawing reminded me of a tree I once created in words, a life tree where each branch, each twig, each leaf was a family, a genus, a species. In time one leaf grew large, flexible, and curious. It learned to stretch around to look at other leaves, bend twigs, break branches. This "Hand Among the Leaves" became the title of an environmental column in Grinnell College's newspaper (in Grinnell, Iowa) where I weekly discussed ideas such as vegetarianism, agricultural self-sufficiency, pesticides and other environmental issues.

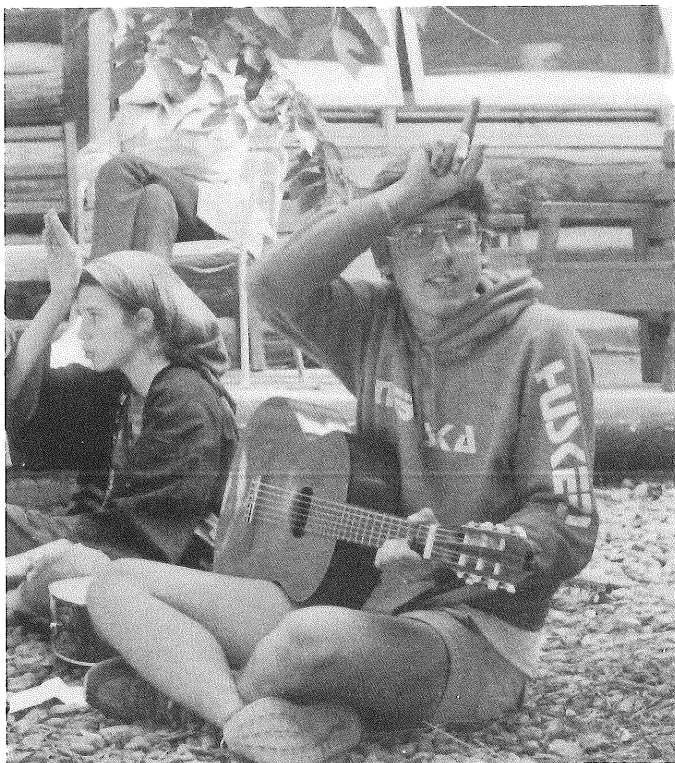
The tree also stood for work on paper recycling campaigns at Grinnell, my bachelor's degree in biology, and my academic and personal interest in a sustainable society. Particularly interested in environmental studies and agriculture, some friends and I organized a class during the fall last year on this subject, which included a visit to The Land Institute. Last March we conducted a three day conference on sustainable agriculture.

The column, the class, and the conference developed out of my increasing interest in food production and global conservation. During the past two years agricultural and environmental books have overrun my dorm room, my house, my apartment. Two years ago while studying in Costa Rica, I remember a number of books on growing healthy food, such as *The Organic Garden*, written by a New England gardener. *Radical Agriculture* and several editions of *State of the World* were also key reference books. Last year, our class readings included Wes Jackson's three books, selections from Wendell Berry, Worldwatch papers, and numerous articles on sustainable agriculture sent by my father, a professor of agronomy. Second semester a class on Human Ecology and Adaptation focused on possible causes of environmental destruction, including hypotheses such as overpopulation, technology and capitalism, and our underlying Western Christian philosophy. Since then, I have read more generally on sustainability and future society, in books such as Pirages's *The Sustainable Society* and Naisbitt's *Megatrends*.

Reading and listening teaches writing and speaking. As one's knowledge increases, as global causes and effects begin to make sense, as dreams push back limits, the ignorance and wonder of the student becomes understanding and challenge. Learning and teaching move continually together, since they are not separate steps in a hierarchical life staircase but rather necessary companions. I have taught Spanish, English, physics, and biology to children, adolescents, and adults at college, at summer camps, and at home. None of the teaching experiences make me feel I am a specialist, but rather that I can communicate diverse information and ideas, that I can adapt as required. Likewise, I have

written articles, a weekly column, songs, short stories, and editorials, for college publications, city newspapers, other magazines, and for myself. Two years ago I spent my summer as a journalism intern for the Nebraska Department of Environmental Control, the state's "EPA." Currently in Madrid I am translating computer manuals from English into Spanish.

Guitars are wood. They are art. And they are hands. The guitar goes beyond its own body. It is the high-touch between mind and earth, Naisbitt's essential counterpart to high-tech. Three years ago I spent a summer with University grass research experiments. With tractors, mowers, and the tasks of transplanting and harvesting samples—I lived a bit of the farm for the first time. After years of books came a month last summer leading dairy cows around the hills of Spain. First-hand interaction with food and art, with energy and nature, making bread and solo-ing through the mountains, keeps essential material interacting with the real world. Traveling and living—in Europe, Central America and the United States—brings an atmosphere to the senses that can never be seen solely through eyes and words. James Michener wrote a thousand pages in Iberia, and his voyage is funny and fascinating. But I have never felt Spain as he did; nor, surely, he as I.



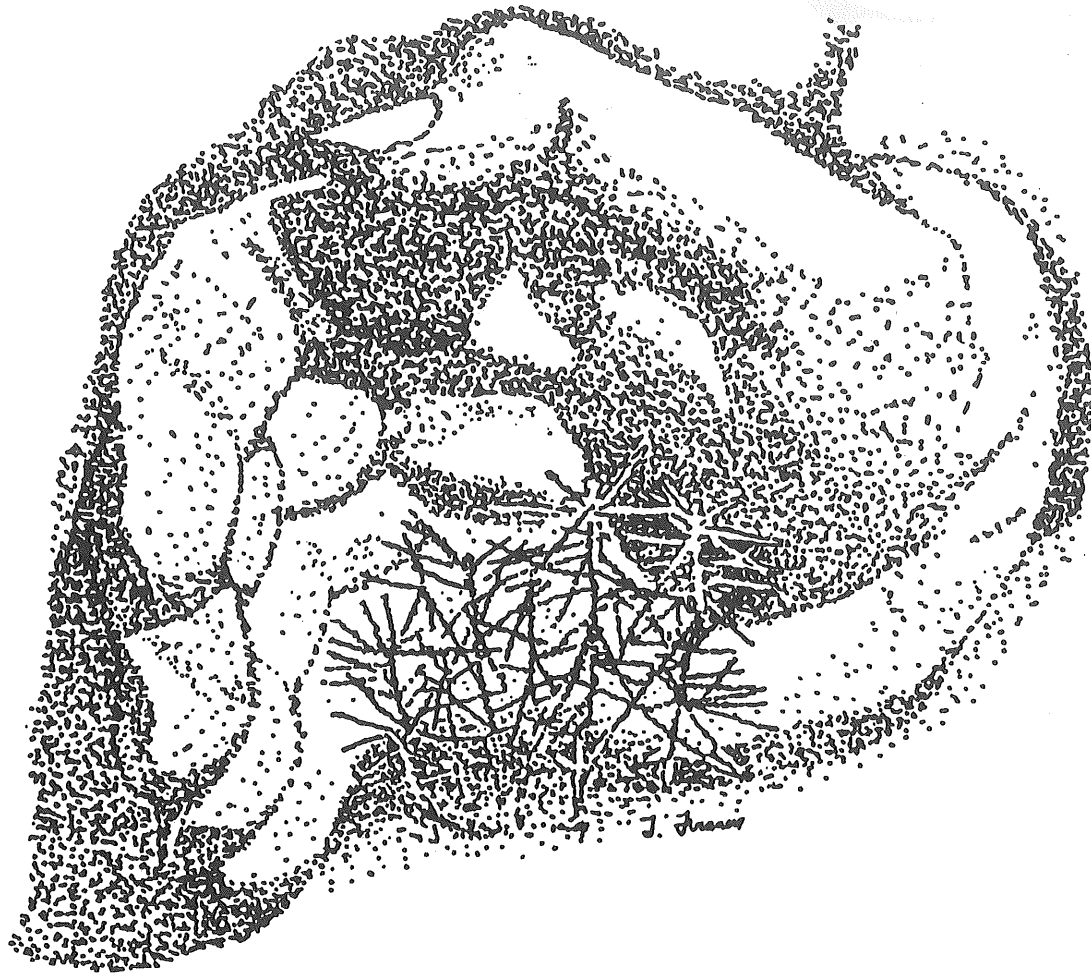
Todd took charge of the children's programs at the Prairie Festival, including "Songs for Kids" on Sunday morning.

Trees are generalists. Trees that live through changing climates, or that stretch up through different biomes, cannot alter their entire bodies to each new set of conditions. Instead, their branches mutate and develop differently, each living with the situation it grows in. We live in times when change occurs so fast that specializing ourselves completely is impractical. In retrospect, the fuzzy focus of liberal arts looks a lot like the world. In Costa Rica I improved my Spanish, altered my social, economic and political biases, and saw nature in the tropics. With little knowledge and lots of interest I spent two months searching for botanical alternatives to pesticides, relying on the memories of wizened old farmers whose children and grandchildren could only describe to me their expertise in immersing their fields in chemical poisons.

Trees also mean time. Trees can live dozens of human generations. They see us as we see the fruit fly, ever adapting to ephemeral changes around us, while they wait for the long-term changes to affect their evolution. As a human, the closest one can come to the vision of such a tree is from people and books, describing the past, living the present, guessing at the future. Sustainable society is the long-term future, for by definition sustainable is long-term. And the best way to learn sustainability is to live it. At The Land I can learn specific knowledge, not with the purpose of specializing, but rather to become a more effective generalist. I can meet others who seek the combination of ideas and practice. I can find out how practices and policies must lengthen in perspective and become involved in that process. Once I was certain that the Third World was the place to work, where food shortages and environmental degradation are the most life-threatening. But how well can a foreigner advise a native on how to live with the land? Surely I, like any native, can work best in my own country, while using ideas from many lands.

The Land Institute is not 1989 reality. It lives in another century, a time when soil has replaced oil, and gas has changed to grass. Nonetheless, The Land has warped back in time to the guzzling, overdeveloped twentieth century. The Land may not effect widespread changes in agricultural practices next year, nor even before its current members are done, but it is built and run in response to a question of what farming will be like in the sustainable society. It is a chance to work and study on a farm of the future, while the present huffs and puffs along behind. Such time warps rarely appear outside of science fiction.

The drawing on the next page was done by Todd Francis.



Woodlot and Windbreak Planted

Berni Jilka

The cool, rainy spring season was perfect for new root growth of the bareroot tree and shrub seedlings in the woodlot and windbreak that we planted in March. But the 105-degree temperatures and the desiccating south winds of summer have been a true challenge to the survival of the plants.

We spent several days hoeing and pulling weeds from around the trees this summer. Although weeds and grasses offer protection from the hot sun and winds, the large weeds, such as velvet-leaf, pigweed, and lamb's quarters also compete for moisture. The weeds also made it difficult for John Craft or John Jilka to see the trees from the tractor while cultivating.

After four weeks without measurable moisture, we had to water the windbreak and woodlot, a time-consuming process because large cracks in the soil greedily swallowed the water. We dug a basin around each trunk to hold the water for the tree's

use. The next step was to spread a mulch of woodchips around each tree to keep the soil from drying excessively, to provide an even soil surface temperature, and to keep weeds under control. The woodchips were donated by a local tree-cutting service, whose crew spent several months in our area clearing limbs and branches away from electric power lines.

Caring for the trees has been a major responsibility of Judy Logback, our summer groundskeeper, as well as part of the regular work of interns. Despite the summer weather, the survival rate of the tree seedlings has been high. The 10% to 15% loss was largely due to a common disease called 'cultivator blight'. In the woodlot, the most vigorous species growing is the black locust, *Robinia pseudoacacia*. This legume is a source of durable wood of high density. It is adaptable to a wide range of soils, tolerating dry conditions and a saline environment.

Other native species are also doing well. *Fraxinus pennsylvanica*, or green ash, is a fairly rapid-growing tree with dense wood. Hackberry, *Celtis occidentali*, has the innate ability to grow in dry soils and under windy conditions, and is an excellent source of firewood. The wood of honey

locust, *Gleditsia triacanthos*, is a valuable source of energy, and, like other species growing in the woodlot, honey locust will resprout after being harvested.

We are encouraged by how much the trees have grown since we planted them in the spring. We look forward to the fall when rain and cooler temperatures will cut down on their maintenance requirements.

Progress Made on Herbarry Renovation

Jon Piper

As the result of extended drought conditions and a design that made caretaking difficult, several Land Institute staff collaborated with Iralee Barnard, botanist and prairie plant illustrator, in the spring of 1989 to create a new design for the Herbarry (See *Land Report* #35). Marty Bender started the Herbarry in 1979 by planting seeds and transplants of prairie perennials in five-meter-long rows with grass in between. We wanted a new arrangement that would serve the Herbarry's esthetic and educational purposes and at the same time facilitate weeding and watering and minimize the need for mowing.

The Herbarry plan features a branching four-meter-wide shortgrass (buffalograss and blue grama) path with clusters of native wildflowers in one-meter strips on either side and the larger expanses to the outside replanted to a mixture of big bluestem, little bluestem, and Indiangrass.

Seed collected over the years from both the Herbarry and native prairie provided one source of plants, and over the winter we started many seedlings in the greenhouse. Fortunately, the cool, moist spring of 1990 was ideal for transplanting. Beginning in March, a cadre of staff and interns transplanted the greenhouse seedlings and moved grasses and wildflowers from their old rows in the Herbarry to new homes alongside the northern path. They also moved the markers that tell the names of the plants. Once the old rows were empty, the lawn areas were plowed, disked, and then seeded to tallgrasses. We were able to complete the northern half of our project, the area between the terrace and Water Well Road. The southern portion of the renovation will await the spring of 1991.

Eventually, as the new prairie becomes established, we think that residents and visitors alike will find the path both relaxing and educational. Rather than making a mad dash across the field separating the classroom building and office building, we hope that those traversing will find the Herbarry a place to pause, reflect quietly, and appreciate nature.



Judy Logback tends new trees with the "weed eater."

Jacksons Are Pew Scholars

Wes and Dana Jackson have been selected to receive a three-year, \$150,000 award in the 1990 class of the Pew Scholars Program in Conservation and the Environment. The Jacksons and nine other recipients were selected out of a field of sixty candidates representing a wide range of disciplines, career emphases and institutional settings.

The Pew Charitable Trusts set up this new program to provide awards to "outstanding scholars who are committed to both research and the application of their findings to the pressing issues of the conservation of biological diversity and directly related environmental problems." Candidates conducting interdisciplinary work were of special interest. Selected universities and four independent nominators recommended candidates to apply for the Pew Scholars award. The Jacksons were invited to submit a joint application.

The Pew awards are intended to provide "significant, flexible support to undertake new, creative avenues of scholarly development." The Land Institute will receive \$50,000 a year for three years to be spent on special projects of Wes and Dana Jackson.

Good Work Takes Good Workers

Kathy Collmer



Berni Jilka

Many people have become intrigued by The Land's philosophy of nature as the standard for agriculture. When visitors (and summer workers) spend time at The Land Institute and become acquainted with its activities, they learn that behind the vision and philosophy of the place is plenty of hard physical work. Interns and staff must care for the five acres of research plots, the garden and grounds, Herbarium, tree plantings, field crops (wheat and alfalfa) and the greenhouse. The equipment must be maintained, the buildings kept in good repair, and sometimes new structures must be built. Leaders with good sense and practical skills must provide background organization and support to get all the work done. Bernadette (Berni) Jilka, intern coordinator, and John Craft, operations manager, competently fulfill this responsibility at The Land Institute.

"When I arrived at The Land Institute for a six-week stint as a summer volunteer, I was amazed at the size and complexity of the research projects. My idea of a research plot had been something on the size of a moderate-size vegetable garden measured in feet, not acres. I had not really been able to explain to my friends in Baltimore just what I would be doing, so I invented what sounded like a reasonable kind of activity. I had expected to work alone weeding, perhaps watering, measuring and supervising a research project for interns on vacation. I had no idea how much teamwork and interaction is required to keep The Land Institute operating smoothly."

Ginnie Streamer
July 1990

Since both John and Berni are modest about their contributions and much of their work goes on behind the scenes, an outsider might not see the importance of what they do. Interns and staff who work with John and Berni, though, appreciate the consequences of their attention to details.

As intern coordinator, Berni, an intern herself in 1989, helped orient the 1990 interns upon their arrival in February, introducing them to the buildings, tools and equipment they would be using throughout their year at The Land. When the greenhouse and field work began, she showed interns techniques for transplanting plants and keeping plots free of weeds.

Berni's background in horticulture (a B.S. in horticulture from Kansas State University and a position as manager of a Missouri garden store) has been an asset in her job. Besides managing native perennials in the research plots, she has directed the renovation of the Herbarium (see article on page 13) and organized the planting of trees in a woodlot and a windbreak. Landscaping around the greenhouse reveals the touch of Berni's green thumb.

One of the most important parts of the intern coordinator job is chairing work meetings from early spring to mid-summer. In these Berni must coordinate intern work schedules with the seasonal demands of the research plots and the priorities set by the research staff who designed the experiments. Daily jobs can include anything from hoeing an acre of Illinois bundleflower to processing reams of data on the eastern gamagrass experiment to harvesting, drying and weighing plants collected from sites on the native prairie. The real challenge arises when it all

needs to be done at the same time—and immediately! One by one, interns describe the work to be done on their particular experiments and the amount of time they think it will take. The staff add garden jobs and maintenance-related tasks. Berni writes these on the blackboard and recruits crews for the projects, and suddenly, several days of work is organized in that maze of lists.

One of the strongest assets Berni brings to her job is her ease and familiarity with farm work. Having grown up on a farm in Saline County, Kansas, where she helped with the family garden, Berni understands farm work and the unique challenges that face farmers. Her commitment to developing ways of farming that sustain not only farmers but the environment on which they and all of us depend extends even beyond the Land Institute. She serves on the board of directors of the Kansas Organic Producers and on the steering committee of Citizens for a Healthy Environment, a Salina environmental group.

The Land Institute's research staff has come to rely on Berni's sense of responsibility to the Land and her ability to juggle many projects simultaneously. Beyond Berni's organizational skills, her warmth, respect for others, and sense of humor have endeared her to the interns with whom she works so closely.

Going the extra mile is also the hallmark of John Craft, The Land's operations manager. John Craft is responsible for overseeing all of the property of The Land. Maintenance and repair of buildings and machinery is a big part of the job. Anyone familiar with Murphy's Law ("anything that can go wrong, will") and the Second Law of Thermodynamics (everything in the universe tends toward a state of maximum disorder!) can appreciate the daily frustrations John must deal with—a swather that breaks down, a temperamental wood burning furnace in the greenhouse, electrical systems on the blink, plumbing gone awry. But while his mechanical competence is impressive, what is most remarkable about John is the grace and humor he maintains through it all.

John Craft's association with The Land Institute began long before he assumed his current position. John began his self-education on wind machines to generate electricity in the summer of 1977 by working on old machines that Wes Jackson purchased for The Land Institute. He designed and built a new wind generator that he called a "Windcraft," which he manufactured full-time while operating his own wind generator company from 1979 to 1982. Several models of his invention were tried out at The Land before the Windcraft currently in use was installed.

In the summer of 1979, John taught a course on energy at The Land with Chuck Washburn,

California State University engineering professor and Friend of The Land. Several times during the next ten years, he also returned to teach short units on alternatives in energy to interns. He describes his association with The Land during those years as somewhat informal. "I was always coming back to fix the wind generators," John recalls with a smile.

In June 1989, after several years of teaching high school science, John returned to the Land full-time to fix much more than wind generators. As operations manager, he was immediately faced with a long list of mechanical problems to work out and major decisions to make. Because the Land had taken on the responsibility of farming the land on Ohio Street that it owns, instead of renting it out, the organization needed an operations manager with some farm background and mechanical ability. John, who grew up on a dairy farm, was the man for the job.

During his first year, John has been responsible for acquiring used farm equipment. He has purchased a combine, swather, hay rake, baler and dump truck and made the repairs and adjustments that were necessary to bring them up to par for the



John Craft

farm operation. John has also done a major overhaul of the Land's International tractor. John Jilka, farm operator, does much of the field work on the farm, but John Craft is responsible for keeping the machinery in good operating condition.

Another major responsibility in this first year was to spend a special grant for a building on the

"Working with Berni and John this summer has been a special privilege. They are two of the many capable people I met at The Land who keep the day-to-day operations going. They are both native Kansans and seem to me to exemplify what is best in the character of the people of the Mid-west. They are generous with their gifts and dedicated to their ideals."

Ginnie Streamer

Ohio Street farm to house the equipment. John selected and purchased a Morton metal building, then customized it for The Land's special use. With the help of the 1989 interns, John also moved all the tools from the red barn behind the classroom building to the closed shed near the greenhouse and completely reorganized the main shop.

Along with other staff members, John takes his turn teaching classroom segments of the interns' ten-month term. In the spring session, John concentrated on the limits to growth and environmental problems connected with growth. His classes reflected a passionate concern with human survival in a world of finite natural resources. Currently John takes time outside his job to act on his concern for the environment by serving on the board of directors of the Kansas Natural Resource Council.



Left: Ginnie Streamer. Above: Don Macfarlane (left foreground), an Australian visitor, and other volunteers who worked on June 27.

Volunteers Make a Difference

Ginnie Streamer, who teaches English in a community college in Baltimore, Maryland, arrived a few days before Prairie Festival and donated her labor for the following six weeks.

Even with the welcome help of an extra crew member, the June field work was overwhelming. When it seemed that we would never get ahead of the weeds in the experimental plots, we asked Friends of The Land in the local area to join a work party on June 27. Thirty volunteers responded. Some came in the morning, but the largest group came from 6:00 to

9:00 P.M. in the evening, so we divided them into crews led by interns and staff.

Our cheerful helpers sweated, swatted mosquitoes, and developed blisters as they hoed weeds at the Ohio Street farm. In the background we could hear the combine motor as John Craft cut the wheat and the tractor motor as John Jilka raked hay. We quit just before dark, satisfied that we had accomplished a lot that evening. Then we drank lemonade and ate ice cream and enjoyed a sing-a-long with Tom Mulhern playing banjo and Kris Schaefer guitar.



Natural Connections

Trees on the Prairie

Paul Muto

People are looking for ways in which they can take positive action to help solve environmental problems such as soil erosion, pollution, depletion of natural resources, groundwater contamination, and the threat of global warming. Many suggestions have been put forth from government agencies to involve citizens in an active campaign to help stop the environmental degradation occurring on both a local and global scale. Kansas Governor Mike Hayden's contribution to promoting citizen involvement has been to initiate a statewide tree planting program.

In his initial letter to Raymond Aslin, State Forester, Governor Hayden expressed concern for the environmental problems of "soil erosion, non-point source pollution, water quality problems, the potential threat of global climate change and increasing demands for natural resources." Although tree planting is not a complete solution to these problems, the governor stated that it would be "one positive action that individual citizens could take to improve the environment."¹ The history of trees in Kansas has been debated for many years and an understanding of their prevalence and role in the ecosystem should be understood before the governor's program is accepted or criticized.

Since the landscape of Kansas has changed greatly since the time of the first settlers, few people have a full understanding of the potential vegetation of the region. Although prairies covered the vast majority of Kansas, forests thrived in certain regions and trees usually bordered waterways providing shelter for wildlife and adding to the ecological diversity of the state.

Before the time of white settlers, the area now known as Kansas was a very different place. The general picture is one of open prairies supporting vast herds of bison. This enduring ecosystem arose in an environment prone to periodic drought and natural

wildfire. The American Indians survived well in this region with their gathering and hunting lifestyle. The earliest white settlers were amazed at the wide open spaces and commented frequently about the absence of timber. Though generally accurate, particularly in western Kansas, this view does tend to make one believe that forests were totally absent from Kansas.

The original forest cover of Kansas is difficult to estimate, but geographers and historians generally accept that in the days before white settlement, forests were more extensive than today. They covered an estimated 4,480,000 acres, or 8.5 percent of Kansas's present land area. Most of these forests were in the eastern third of the state, but some trees, primarily cottonwoods, extended westward as well, surviving in the wetter river valleys where periodic flooding allowed the shift from grass to riparian woodlands. The earliest homesteaders cleared much of the forest "under the impression that land that would not grow trees must be worthless for agriculture." Later on, widespread tree plantings took place on the prairies for many reasons. Some of these reasons were sound, such as for protection from wind and water erosion, but others were dubious, such as the belief that trees would modify the harsh, dry climate by bringing more rainfall.²

White settlement so altered the distribution of trees that the landscape today is very different from what it once was. The eastern third of the state has fewer trees, and the remaining trees are distributed quite differently. Many exist in upland areas that originally had a grassland cover. The river bottom areas, where the densest forest once stood, are now devoted primarily to agriculture. In the western two thirds of the state, because of vigorous tree planting programs begun in the last century and the reduction of prairie fires, there are more trees now than before white settlement. Windbreaks and residential plantings make up a large proportion of these new trees and are a necessary consequence of the settlement and agricultural practices of the region.³

Much of the riparian woodland in western Kansas has been altered by agricultural use. Due to an increase in irrigation, there has been a drop in the water table causing a reduction in stream level, in some cases drying streams up completely. An example is the Arkansas River in southwest Kansas. Heavy pumping from the river alluvium has lowered the water table so much that in many years the river ceases to flow.⁴ This has had a devastating effect on the trees that line the river. As the trees disappear from the rivers, so does the wildlife that depends on the shelter provided by the trees. Increased erosion occurs as well, especially during flood times when rapidly flowing water eats away at stream banks once held in place by tree roots. In order to bring back a more natural tree cover to western Kansas, the politics of water use must first be addressed.

Because of the importance of agriculture, it would be impossible to restore the Kansas landscape to its pre-settlement condition. However, problems such as soil erosion, depletion of natural resources, decline in groundwater quality, and loss of genetic diversity necessitate some altering of the environment in order to lessen the impact of humans on the ecosystem. Tree planting would have many benefits. The governor, aided by the department of forestry, has proposed a program to plant 2.4 million trees each year in the decade of the 90's, one for each citizen of Kansas. These tree plantings would fall into four categories: residential, public lands, schools, and conservation plantings.⁵ Trees in residential areas provide many benefits. Besides the obvious result of beautifying neighborhoods, trees provide shade and soften wind, helping to save energy in cooling and heating homes. Trees would also be planted in public lands such as state and city parks,



Tracy Noel and Tamara Kraus plant trees for a windbreak along the south edge of the field on Water Well Road.

city office buildings, on school property and around landfills. The emphasis on schools in the governor's tree planting program would focus not only on the actual planting of trees, but also on creating an awareness of the environmental benefits of trees. Conservation plantings would have the most obvious and far reaching economic and environmental benefits. Extensive windbreaks provide a protective barrier from the potentially damaging effects of the wind for homes, crops, and livestock. Rows of trees along field margins help reduce soil erosion by buffering the wind and acting as a soil and moisture trap. A secondary advantage is as additional wildlife habitat.⁶

The possibilities of agroforestry, the interplanting of trees and crops, are beginning to be realized in many parts of the world and may add diversity and sustainability to Kansas agriculture. Agroforestry is defined as a sustainable land and crop management system that combines the production of woody forest crops, including fruit and other tree crops, with field crops simultaneously or sequentially on the same unit of land.⁷ This option for trees should be further explored.

Trees are sometimes used as windbreaks in areas that perhaps never supported trees, but because of the practice of till agriculture in those areas, protection from the wind is a necessary element in promoting sustainability. In a semi-arid environment such as western Kansas, trees do not survive as the normal climax species and would be difficult to establish and maintain without a large water input. In these regions, natural grass windbreaks have shown to be effective in reducing wind erosion and would be more in balance with the vegetative potential of the region.⁸ By using nature as our model, the appropriate areas for tree planting should be obvious. This model for sustainability should be kept in mind when considering any program, such as the governor's tree planting program, that promotes large scale environmental alteration.

In parts of eastern Kansas, especially in riverbottom areas where dense forest growth once occurred, economically valuable trees such as black walnut, oak, hickory, and cottonwood could be planted, helping to promote self reliance for building materials, furniture production, and pulp production. Kansas is already second in the nation in domestic walnut veneer log production and through intensive management practices, walnut can provide an excellent return on woodland property.⁹

The environmental benefits of forests are numerous. Trees provide wildlife habitat and protect water quality. Trees act as a carbon sink. Every tree removes approximately thirteen pounds of carbon dioxide from the atmosphere per year, a consideration when confronting the possibility of the greenhouse

effect. However, when compared to the nineteen pounds of carbon dioxide emitted by burning one gallon of gasoline, it is very clear that the more immediate and effective way to lessen the greenhouse effect would be to drastically reduce fossil fuel use.¹⁰ Tree planting has been a safe way for politicians to seemingly deal with the greenhouse effect without facing up to the dilemma of our fossil fuel addiction. President Bush has also mentioned the possibilities of alleviating the greenhouse effect by large scale tree planting, but has failed to promote any program to reduce fossil fuel consumption. Tree planting should be recognized as a positive action to help restore environments to their natural state. It should not be used as a technological "fix" so that we can continue to live in an unsustainable fashion.

When planting new areas to trees, we should consider what kind of vegetation once occurred there before settlers and agriculture. By knowing the potential vegetation of a region, we can come to a clearer understanding of what nature intended as the most stable and enduring ecosystem. This is using nature as a model. Since the majority of forests occurred in eastern Kansas and along rivers in the west, these would be the most suitable areas to replant, particularly for commercial hardwood production. In areas that once supported tallgrass prairie, but now support till agriculture, trees could be used as windbreaks to reduce soil erosion. In the more arid areas of western Kansas, where shortgrass prairie once prevailed, trees would have a difficult time surviving and alternative windbreaks would have to be utilized. Perhaps even the presence of till agriculture in those areas should be questioned on the basis of non-sustainability. The use of fossil water for crops not suited to a region is an example which doesn't suit our "nature as model" criterion.

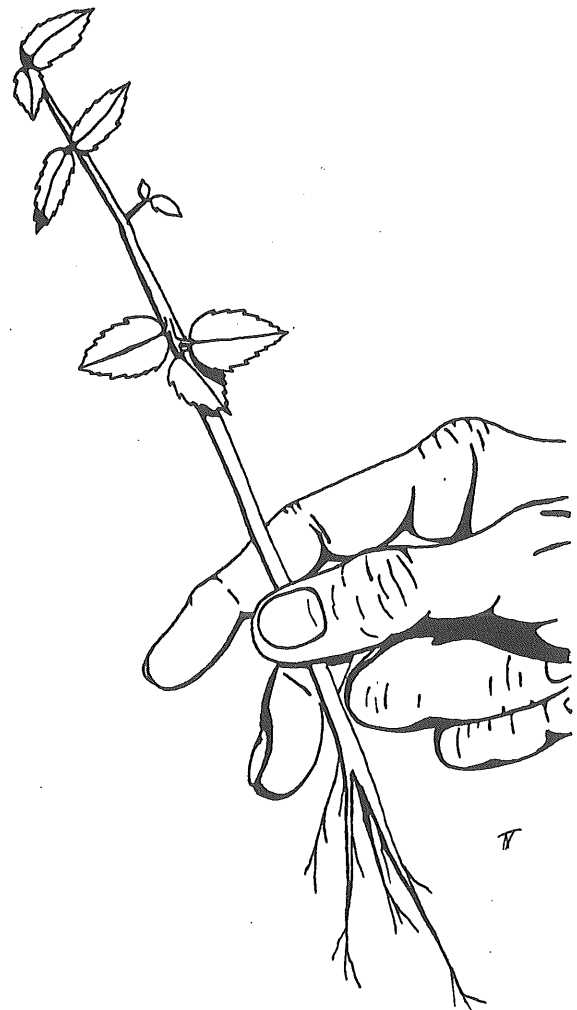
Whereas trees are the focus of the governor's planting program, perhaps more emphasis should be placed on regenerating original grassland cover. Planting areas back to native grasses and forbs would have many of the same environmental benefits as trees. Prairies would not have the same storage capacity for atmospheric carbon, but this is one of the least important reasons for planting trees in Kansas. Prairies would, however, be more in tune with using nature as a model for sustainability and would be applicable to a larger region of Kansas. The governor's tree planting program, when applied to suitable regions of Kansas, is a fine opportunity for citizens to become involved in environmental restoration and aid in solving environmental problems that require trees as a solution. Perhaps a similar program could be initiated for prairies. More native prairie would add beauty and natural diversity to the current agricultural landscape and remind us of the unique and spectacular ecosystem that once blanketed Kansas.

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Kansas Has State Soil

Tamara Kraus

Designers must stretch their imaginations to create a new Kansas postcard—one depicting the newest state symbol, the Harney silt loam.

On April 12, 1990, Governor Mike Hayden signed Senate Bill 96 which proclaimed Harney silt loam the official state soil of Kansas. The passage of this act followed over five years of continual lobbying by the State Soil Coalition headed by the Kansas Association of Professional Soil Classifiers. The statewide effort was catalyzed by the enduring enthusiasm and energies of Orville Bidwell. A former member of the Land Institute Board of Directors, Bidwell is a professor emeritus of soils in the Agronomy Department of Kansas State University.

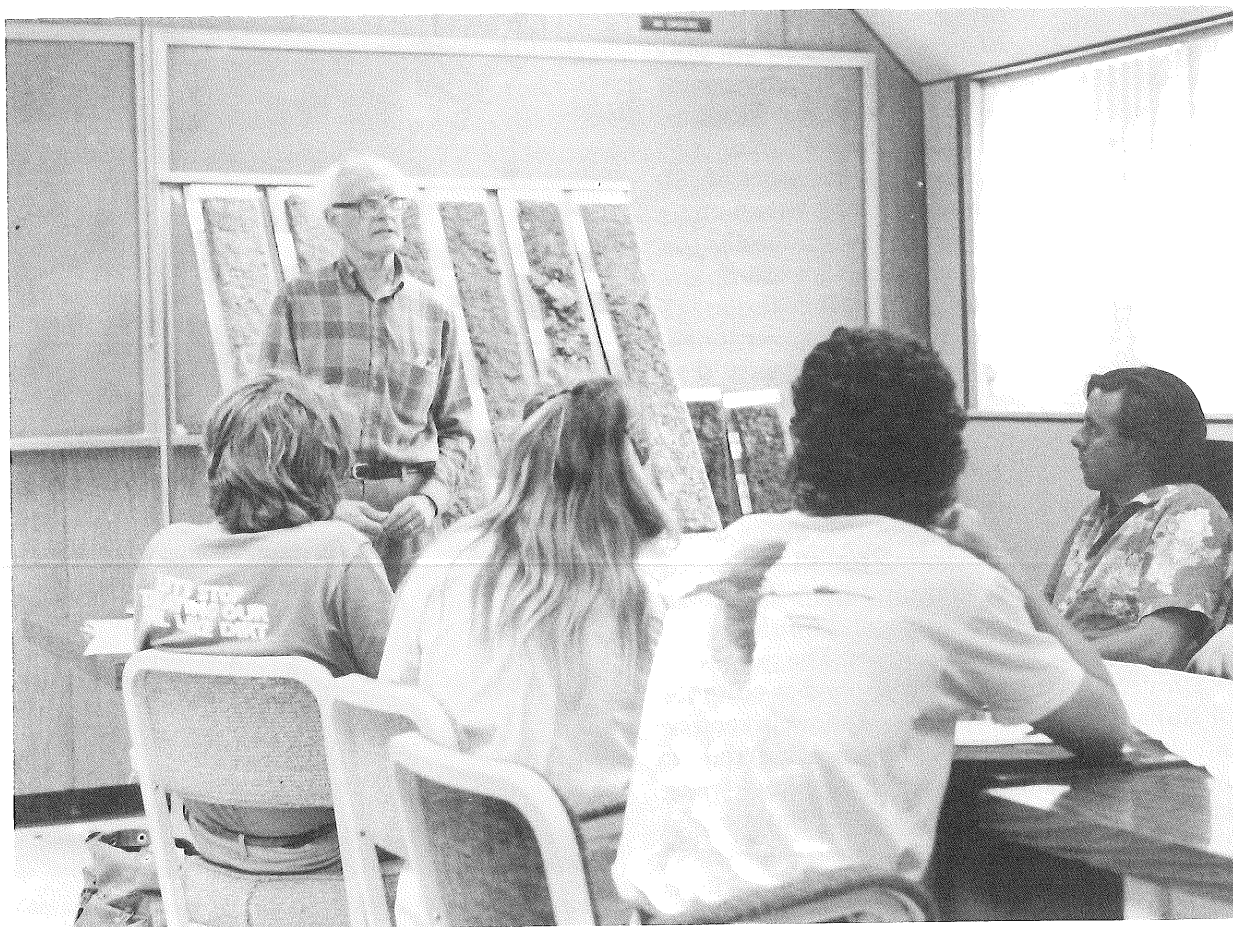
Professor Bidwell gives five important reasons for establishing a state soil (see "Why Does Kansas Need a State Soil," *The Land Report*, Summer '87). Adopting a state soil (1) provides an educational tool by presenting an acceptable model of what soil is, (2) recognizes the unique symbiotic relationships existing in the North American prairie, (3) acknowledges the

state's economic dependence on the productivity of its soils, (4) recognizes the productivity/fertility of the Harney silt loam, (5) commemorates completion of the state soil inventory in 1987.

The Harney silt loam was chosen as the state soil not only because it covers a major portion of Kansas, but also because it typifies prairie soils. This soil type is found on nearly four million acres in 25 counties across the state. It is known for its high natural fertility and ability to produce excellent wheat and sorghum yields with limited applications of commercial fertilizer. Its level slopes and thick, dark colored silt loam surface are ideal for growing crops with minimal erosion. The name of this soil comes from the Wichita Indian term "Harahey," referring to the Pawnee Indians.

The first state to officially adopt a state soil was Nebraska in 1979, followed by Wisconsin, Vermont, Oklahoma, Florida, and South Dakota.

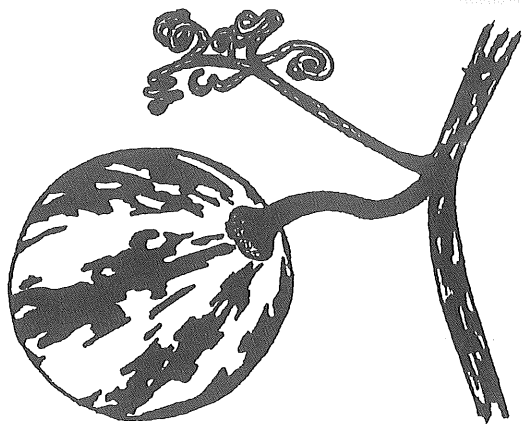
The Land Institute commends all those who worked towards the adoption of the Kansas state soil and shares their hope that this designation will help increase public commitment to soil conservation. Please note, however, that Orville Bidwell isn't completely satisfied. He now proposes that the Harney silt loam also be made the national soil!



Orville Bidwell teaches 1989 interns about soil.

Buffalo Gourd Roams the Prairie

Tracy Noel



Driving, biking, or walking down a Kansas section road in summer, it's hard not to notice a large plant with lots of giant green leaves creeping along the roadside. Anytime between June and September you're likely to see a few big yellow flowers nestled among the leaves. By now there should be round green and yellow striped fruits about the size of tennis balls where the flowers were earlier. It's from these odd fruits and its home on the original bison plains that this plant gets its name. You guessed it—it's buffalo gourd, known by its scientific name, *Cucurbita foetidissima*.

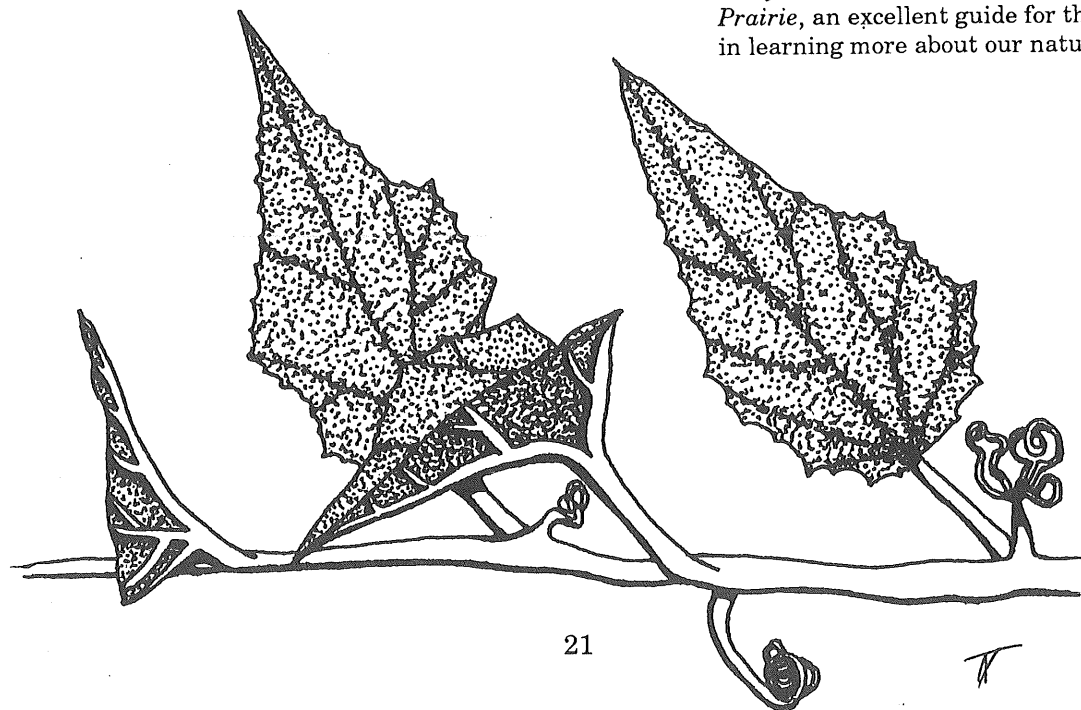
To answer everyone's question: No, buffalo don't eat buffalo gourd. Although much of the plant is edible, it's decidedly bitter unless it is processed. The fleshy part of the fruit can be eaten, but anyone with even partially functioning taste buds might find it difficult to do so. However, those who have been hopefully eyeing this plant for a future food crop should not be discouraged. The Native Americans of Southern California found that the meat of the seeds is much less bitter, and they commonly ground the seeds into a mush which was a good source of protein

and oil. Also, as an alternative use, both the fruit and the root contain enough saponin to make a fine soap substitute.

The root of the buffalo gourd is enormous (the largest ever weighed was 178 pounds), and some may grow to be the size of a person! It also is edible and contains high levels of protein and starch. When processed to combat the bitterness, the root can be used as a sweetener or stabilizer, or to make a tapioca-type pudding. But Native Americans did not recognize the edibility of the root so much as its medicinal properties as a cure for rheumatism, constipation, sores and ulcers. The buffalo gourd, by any of its multiple native names, was deeply respected by the Omaha, Ponca, Dakota and others for its mystical qualities. When harvesting the root, they feared that any harm caused to it would result in harm either to the harvester or to a relative. Not surprisingly then, Native Americans took great care when digging these giants of the prairie, and they did so only when necessary. There are stories of natives too fearful to even attempt digging, but eager to accept root samples from white folks who had taken the risk upon themselves.

Those interested in growing this wild perennial for personal use or pleasure and brave enough to ignore native legend can start plants with just a small piece of the root crown. Those more sensitive to such warnings can plant seeds of the gourd. Be cautious if planting it in a garden. Buffalo gourd needs lots of room!

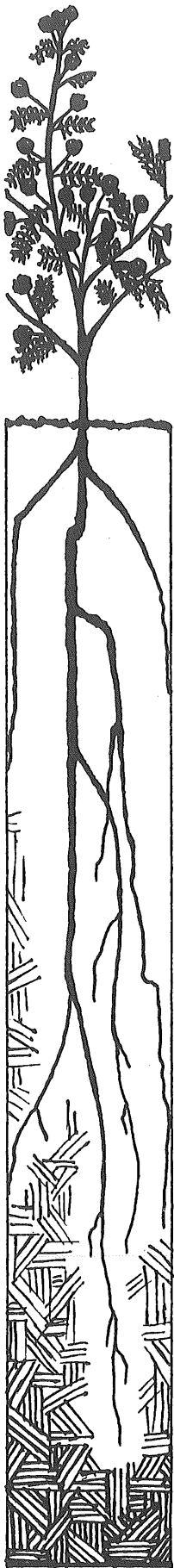
Much of this information comes from Kelly Kindscher's *Edible Wild Plants of the Prairie*, an excellent guide for those interested in learning more about our natural neighbors.



New Roots for Agriculture

Summer Research Update

Jake Vail



For a 43-week term each year, agricultural interns come to The Land Institute to learn what “using nature as measure” and “a marriage of ecology and agriculture” mean. As they participate in the early stages of our very long-term research, the interns soon learn that such phrases mean hard work in all kinds of weather, and hard thinking about all kinds of subjects.

The Land Institute research staff (Mary Handley, plant pathologist; Peter Kulakow, plant breeder; Jon Piper, ecologist; and Wes Jackson, geneticist and Land Institute president) presents a list of new and ongoing experiments to the interns at the start of each term. Each intern chooses an experiment to oversee for the duration of her/his stay, but throughout the year everyone works on every experiment. At year’s end, each intern is responsible for a written summary of the results of their chosen experiment, published in *The Land Institute Research Report*, and an oral presentation to the Research Advisory Group, a body of interested faculty and students assembled at Kansas State University.

The goal of research at The Land Institute is a truly sustainable agriculture that uses nature as measure. The prairie renews rather than depletes soil and natural communities, and we see it as a model for sustainable agriculture. For over four years we’ve studied the patterns and processes of the prairie here at The Land Institute and pondered how those lessons might be applied to agriculture. Holly Ewing has led us out to the prairie three times this year to monitor seasonal productivity and species composition by clipping and comparing vegetation in four different sites. This ongoing study provides valuable clues to how we might best model a new type of agriculture based on the prairie, what we call a perennial polyculture.

Following two drought years, a normally wet spring helped the 1990 re-

search season get off to a vigorous start. After seemingly endless hours nurturing eastern gamagrass (*Tripsacum dactyloides*) seedlings in the greenhouse, we transplanted them to research plots on the Ohio Street farm in May. Kathy Collmer organized the planting of 4,589 seedlings, representing seed gathered from nineteen counties in Kansas and Missouri. Kathy’s experiment, part of which was planted in 1989, is designed to study genetic variation within and between natural populations of gamagrass. Her plants are now green and lush and blowing in the wind, just east of a field of tall spikes of *Leymus racemosus*.

Leymus racemosus, a cool-season perennial grass, has a growing season similar to that of winter wheat. Tracy Noel is overseeing an experiment which, like Kathy’s, studies variation in wild plants for characteristics needed to develop them into perennial grain crops. 196 half-sib leymus accessions (plants which share a common mother but through cross-pollination have different fathers) were planted last year and flowered for the first time this May and June. A big crew harvested the seed, and now Tracy and others are busy threshing and weighing it. In the past Europeans have eaten leymus, and we hope to revive that practice here. Tracy’s observations will help us find high-yielding, vigorous plants.

In studying the prairie as a model for a sustainable agriculture, we have seen how different plant species growing in close association use water, nutrients, and light differently over time and in space. In our preliminary designs for a perennial polyculture we follow that example and are including warm-season and cool-season grasses (eastern gamagrass and leymus) and a perennial legume native to the plains, Illinois bundleflower (*Desmanthus illinoensis*). Illinois bundleflower is the focus of several of this year’s experiments.

Jean-Luc Jannink and Doug Romig are working together to domesticate

Illinois bundleflower as a grain legume and perennial polyculture component. Their approach is three-fold. They are making our first test variety by combining seed from top-yielding collections of previous years. Second, they continue to evaluate new collections. Doug and Jean-Luc are also expanding our efforts to breed Illinois bundleflower that doesn't drop its seeds, or shatter, after it matures. A large part of this experiment is new, including about an acre planted in May to select for high seed yield among hybrids between a shatter-resistant parent and several shatter-susceptible parents.

Illinois bundleflower is also part of an experiment now in its third year, presently overseen by Paul Muto. In a breeding program that has a "domestic prairie" as its goal, it makes sense to study variability within a species grown alongside other species in polycultures. In Paul's experiment, 28 different accessions (plants gathered from different locations) of Illinois bundleflower and 28 different accessions of eastern gamagrass are growing both in monoculture blocks and with each other in simple bicultures. Measurements of seed yield, vigor, disease incidence, and insect populations in both cropping systems will help us understand how accessions of Illinois bundleflower and eastern gamagrass respond to different cropping arrangements.

Todd Francis was using this and other experiments to design our first large-scale perennial polyculture, which will be established next year. The polyculture will be planted with species in monocultures, and in polycultures with ratios of grasses to legumes that mimic ratios found in Holly's prairie study. Two very different sites will be contrasted: the level, fertile soil of the research plots on Ohio Street and a sloping portion of revegetated prairie. This year Todd started preliminary studies of establishment procedures and methods of estimating eastern gamagrass, Illinois bundleflower, and leymus growth (see pg. 10). Jon Piper and Jean-Luc Jannink have taken over the responsibility for this work.

By applying nature's example to farming, we wonder if we can manage the problem of pest and disease epidemics as the prairie does — by planting a mixture of perennials. Pests and pathogens are always present, but to get an idea of their interactions in different environments Kris Schaefer is comparing patterns of common fungal infestations, anthracnose and leaf rust, in native populations to patterns in cultivated populations of eastern gamagrass. Last year we saw that plants known to be disease-susceptible when planted in monocultures with other gamagrass showed significantly lower levels of disease when transplanted to the prairie. Kris will also be traveling to native populations where we have formerly gathered the gamagrass now growing in our experiments and compare disease

levels there with what is present here. Another part of this marriage of ecology and agriculture is transplanting more disease-susceptible plants to different natural settings to watch how plant-pathogen interactions change with environment.

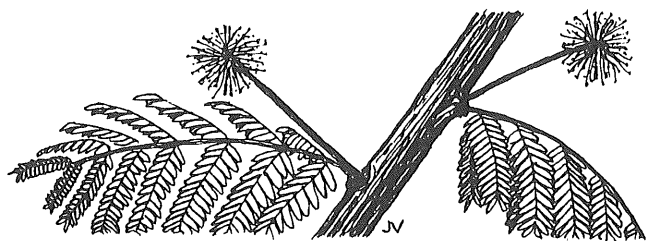
These experiments are biological explorations, seeking to answer four questions the prairie led us to ask:

1. Are perennialism and high seed yield mutually exclusive?
2. Can a polyculture of perennials out-yield the same plants grown in a monoculture?
3. Can a perennial polyculture sponsor its own fertility, especially with respect to nitrogen?
4. Can a perennial polyculture limit outbreaks of pests and pathogens?

Another experiment, conducted this year by Tamara Kraus, investigates the possibility of turning an already domesticated annual crop into a perennial. This is the seventh year of breeding grain sorghum with its wild perennial relative, *Sorghum halepense*. *Sorghum halepense* has underground stems, or rhizomes, which allow it to overwinter in this region. By crossing and backcrossing the two sorghums we hope to introduce the ability to overwinter into grain sorghum and thereby "perennialize" it. Since soon after her arrival at The Land in February, Tamara has been making crosses in the greenhouse, and in June planted seeds from the crosses in the field. She'll be watching for rhizome production as the seasons cycle past.

It is encouraging that from supermarket aisles to the halls of Congress, people are increasingly paying attention to agriculture and its ecological, economic, and cultural effects. The USDA's Low-Input Sustainable Agriculture (LISA) program is forging new connections between land-grant universities, private organizations, and farmers and is a large step toward more sustainable agriculture. Getting better at low-input techniques of farming is important for both ecology and economy. But by itself this approach only postpones thinking about limited fossil fuel supplies, limited soil, and limited knowledge. We need to discover the natural processes of each region and learn from nature how to farm sustainably.

Imagine interns doing the sorts of experiments outlined above in every watershed of the world!



Sustainable Agriculture: A Beginning in Iowa

Janine Calsbeek

Iowa actually admitted it. Agriculture is its top polluter of groundwater.

Bob Libra, hydrogeologist with the Department of Natural Resources in Iowa City, says that people on the coasts were surprised. In a state so economically dependent on agriculture (eighty percent of Iowa land is farmland), it's not easy to face farming's negatives. But Iowa did. The state's Groundwater Protection Act, adopted in 1987, taxes fertilizer and pesticide use and provides funds for sustainable agricultural research and education.

Groundwater contamination by farm chemicals is not Iowa's only problem. Soil erosion is high. The state is number four in the nation— behind Texas, Illinois, and Kansas— in the amount of its prime farmland used as cropland. Iowa ranks fifth in the amount of sheet and rill erosion on cropland annually. Soil conservation statistics show that soil erosion in Iowa decreased between 1982 and 1987. Nevertheless, in 1987, Iowa tied Kentucky as the state with the most sheet and rill erosion per acre of non-federal rural land (the category includes cropland, pastureland, rangeland and forest), 5.5 tons per acre per year.¹

Blend into the Mainstream

Jerry De Witt thinks Iowans are reviving the ideals of the 1960s. De Witt and others interested in sustainable agriculture are now forty-some years old. They had long hair and wild dreams in the 1960s. In the 1980s they dealt with the farm economy, environmental catastrophes and health problems.

"Now they have experience and power," he said. Now they can implement changes, as he put it, "in a more livable framework."

"It's more than talk. There's tremendous excitement," he emphasized.

De Witt is associate director of extension in Iowa, based at Iowa State University (ISU) in Ames. He thinks it's significant that over seventy percent of Iowa farmers want to use fewer inputs, according to a poll taken last year.² He also agrees that the groundwater legislation is significant. It has provided funds and impetus for research, "allowing us to move very quickly." Extension has \$2 million targeted for water quality pilot programs in Iowa.

Iowa State scientists have acknowledged the work of an active grassroots group called the Practical Farmers of Iowa (PFI) and are working cooperatively with the organization. They found office space in the ISU agronomy building for the PFI coordinator, Rick Exner. Recently Jerry De Witt led a two-

day field tour of "low-input farms" for extension staff in conjunction with PFI.

De Witt wants regular extension publications to include information about sustainable agriculture rather than publish it in separate brochures kept in a corner. The trick is "a blending of sustainable concepts into the mainstream," he said. Sustainability is a continuum, he believes, "a step-by-step thing."

Some say that De Witt deserves the major credit for getting extension involved with sustainable agriculture. Rick Exner thinks so. "There are benefits in adopting it as an issue for extension," said Exner. In the past, extension has been criticized for embracing high-input agriculture.

Iowa extension is still doing traditional things, but also new things, De Witt said. "We're almost pleading with the public; forget what you think extension is." De Witt wants people to look again, to see the changes.

Darling Baby

Behind the groundwater legislation was surprising research, according to Bernie Hoyer. Hoyer and George Hallberg, both of the Iowa Geological Survey in the Department of Natural Resources, found that nitrate contamination in aquifers of



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northeast Iowa was associated with the percolation of water through the soil.

"That surprised everybody," said Hoyer. It was earlier assumed that nitrate contamination was related exclusively to sink holes.

Moreover, they found an association between nitrate contamination and the depth of soil. In regions where less than 50 feet of soil caps the aquifer (with no sinkholes), typical nitrate levels in wells 50-100 feet deep were three times those in regions where the soil cap was thicker.

Then, about eight years ago, the Big Spring research team in Clayton County found a low but persistent concentration of pesticides wherever there were nitrate problems. The herbicide used most extensively in the area, Atrazine, was getting into the groundwater through infiltration.

A third study of 180 wells also found low concentrations of herbicides. Later, statewide studies of 900 sites found herbicides in ten to eleven percent of wells, even under extreme drought conditions, according to Hoyer. Minnesota, Wisconsin and Nebraska have since done similar studies with similar conclusions.

"Everybody was skeptical at first, as it should be," said Hoyer. "And there are still skeptics out there." But Iowa legislators were convinced. They could see that since groundwater in northeast Iowa is contaminated mainly by percolation, not sinkholes, farming techniques make a major difference.

Defined by Iowa's groundwater legislation, sustainable agriculture is "...the appropriate use of crop and livestock systems and agricultural inputs supporting those activities which maintain economic and social viability while preserving the high productivity and quality of Iowa's land." Every brochure printed by the Leopold Center for Sustainable Agriculture includes this definition.

The groundwater legislation did not establish regulations on farming practices. It created the Leopold Center at ISU which does research and education to reduce negative impacts of agriculture and to develop sustainable farming practices. Sustainable agriculture grants funded in 1989 by the center totaled more than \$500,000. The Center created seven teams, interdisciplinary focus groups composed of plant ecologists, agronomists, entomologists, sociologists and farmers who come together to identify areas where research work is needed.

Initial funding provided by the legislation came from oil overcharge funds—money oil companies were required to refund to the states. Additional funding now comes through fertilizer and pesticide fees levied by the state under the Groundwater Protection Act. The Leopold Center also seeks outside support, although not from agricultural input companies.

Ron Vos credits legislative "insight and fore-

Iowa is Leading

Even Garth Youngberg thinks Iowa is moving. Director of the Institute for Alternative Agriculture in Greenbelt, Maryland, Youngberg believes that Iowa has emerged as one of the more active states in the sustainable agriculture movement. It doesn't take long for him to come up with a list of reasons why.

- The Groundwater Protection Act of 1987. "I'm not sure there's another one (like it) anywhere."
- Practical Farmers of Iowa (PFI). "They're probably the most frequently mentioned grassroots (farm) organization."
- Dick Thompson, first president of PFI, a farmer from Boone, Iowa. "He has national prominence."
- The Leopold Center at Iowa State University. "It's visible."
- Integrated demonstration projects, multi-institutional. "Even the Agriculture Research Service has the Soil Tilth Lab doing work involving Thompson's farm," according to Youngberg.
- George Hallberg's groundwater work with the Geological Survey of the Division of Natural Resources in Iowa.
- The Des Moines Register. "The state paper (has given these issues) considerable PR." *The Register* gets read all across the country, too. When Youngberg worked in the U.S. Department of Agriculture in the early 1980s, *The Register* was "sort of the Bible," the first paper read when one wanted to know grassroots sentiment.

sight" for the groundwater legislation. Vos, director of the Agriculture Stewardship Center at Dordt College in Sioux Center, Iowa, has been a member of the Practical Farmers of Iowa since early on. He said that PFI was first perceived as somewhat non-scientific, not mainstream. "Then we got the Groundwater Protection Act and the Leopold Center and suddenly PFI became a darling baby," he said.

"We're witnessing the beginning of a revolution, maybe a quiet revolution. I don't want it to sound like a big revolution," Vos continued. "But four to five years ago, nobody was talking about it."

References

1. USDA Soil Conservation Service Summary Report, 1987. National Resources Inventory, Statistical Bulletin #790, Tables 6,7 and 11.
2. Iowa State University survey conducted by Paul Lasley, ISU extension sociologist, and Michael Duffy, economist, 1989. 2,001 farmers were polled.

The Practical Farmers of Iowa

Janine Calsbeek

The farmer and the university may become friends. The opportunity comes through on-farm research, with farmers providing the laboratory and university scientists collecting some of the data. Rick Exner, extension associate and coordinator of Practical Farmers of Iowa, is encouraged. Practical Farmers of Iowa (PFI) had seven different cooperative research projects last year involving PFI producers with scientists from Iowa State University (ISU), the U.S. Department of Agriculture (USDA) Soil Tilth Lab, the USDA Agricultural Research Service at Lincoln, Nebraska, and Pioneer Hi-Bred Company.

ISU botanist Dr. Tom Jurik conducted a detailed study of weed control in ridge-till cultivation with and without herbicides on four PFI farms. Other ISU researchers are working on biological control of musk thistle, late-season stalk tissue tests for corn and the drilling of oats on permanent ridges. The Soil Tilth Lab is comparing a conventional farm system to Dick and Sharon Thompson's farm near Boone. Measurements include water infiltration, nutrient status, and populations of earthworms and carabid beetles, among others.

PFI is a vehicle for getting researchers "in real life situations," said Exner. "Farmers have a role in putting out the treatments and providing the management, which is critical. The researcher can take additional measurements that the farmer is neither trained nor equipped to make."

"We need the university and the university needs us," said Ron Rosmann, PFI president who farms near Harlan, Iowa.

University scientists in other states are interested in Iowa's research. This fall Rosmann and Exner will represent PFI at the national meeting of the American Society of Agronomy in San Antonio, Texas. "They want us to talk about our on-farm research," said Exner. "It's in the middle of soybean harvest, but Ron said he'd do it."

Not Just Dick Anymore

Exner, Rosmann and Practical Farmers of Iowa began working on low-input sustainable agriculture years ago. An Iowa State doctoral student, Exner has done several research projects at the farm of Dick and Sharon Thompson, pioneers of sustainable agriculture in Iowa. One study involved interseeding forage legumes in corn fields.

In the early 80s, Exner was part

of the three biological farming conferences at Iowa State University, sponsored by former ISU animal ecologist Robert Dahlgren. At one of the conferences, Dick Thompson and Exner independently stood up and noted the "practical knowledge" of the farmers attending. "Perhaps we need an organization," they both said. The organization got rolling in 1985 with Dick Thompson serving as the initial president.

"But it's not just Dick anymore," said Exner. PFI boasts over 300 members, with 28 cooperators who do on-farm research.

Field-size Trials

Information is PFI's number one priority. Cooperating farmers do their own research—comparing nitrogen fertilizer rates, for instance. Rosmann said that with three years of data, in 35 locations, they've found almost no yield difference between high and low rates of applied nitrogen. Average corn yield was 125 bushels per acre with the application of 130 pounds of nitrogen. With 70 pounds of nitrogen, average corn yield was 124 bushels per acre.

PFI members were "guinea pigs" with the late-spring soil nitrate test, adapted for Iowa by Alfred Blackmer of ISU. Now that the test is available, PFI is helping to study use of it in early spring before planting.

They're also comparing corn and soybean fields where herbicide has been applied to those in which none has been applied. In 28 ridge-tilled fields over three years, there were no yield differences. And they are studying cropping systems that do not rely on livestock to see if the cash grain farmer could make a reduced-input system work.

Cooperators get together once annually to discuss and plan trials and once to report their



Practical Farmers of Iowa Field Day

Fertilizer Profits Threatened

Resistance is inevitable.

The fertilizer industry is "on both sides," according to Rick Exner, Coordinator of Practical Farmers of Iowa. On the one hand, "there are progressive individuals who don't want to recommend more inputs than needed, who want to remain competitive by keeping their customers profitable."

The state fertilizer dealers' chapter "deserves some credit," Exner continued. The association helped pay for Alfred Blackmer's work with the late-spring soil nitrate test. Before the test, producers predicted nitrogen needs based on cropping history and yield goal. It was safer to guess high, of course.

Last year cooperators in the Practical Farmers of Iowa who used the Blackmer test applied 57 pounds of nitrogen per acre less than the customary rate. Fertilizer dealers testing it reduced nitrogen rates even more. Exner speculated that it was because there was nitrogen carryover from 1988.

"But the test really proved itself useful last year," Exner added. Now the test is widely available.

On the other hand, fertilizer and chemical dealers have somewhat disassociated themselves from Iowa State University (ISU). In previous years the Agriculture Fertilizer and Chemical Dealers Association always held a joint conference with ISU in the spring, but in the last couple of years, the

fertilizer and chemical dealers have pulled out, holding a separate conference.

"The stated reason is the economics of putting on a conference. But a lot of people feel it's because some are unhappy with the way things are going at ISU," Exner said. He doesn't know the specifics but doesn't think the association is upset about the emphasis on low-input sustainable agriculture. Maybe they are disturbed because ISU's soil fertility specialist claims that most fields in the state are high in phosphorus and potassium and won't respond to additional applications. "It's hard to argue with that," said Exner.

In addition, several national organizations connected with the input business are using "inflammatory terms" lately, according to Exner. He mentioned the Potash and Phosphate Institute, along with several trade magazines and some farmer publications.

"They paint sustainable agriculture in as extreme terms as possible. One called the Alternative Agriculture report (prepared by the National Research Council of the National Academy of Science) 'twisted science.' The goal is apparently to polarize the agricultural community. LISA (Low-Input Sustainable Agriculture) has been an easy name to make fun of. But whatever you call it, the issues aren't going away."

results to the PFI membership. Most of the actual decisions are made by farmer researchers in collaboration with the board of directors who are also farmers. ISU agronomists serve on a PFI technical advisory board to consider questions on field trial design and methodology.

PFI research plots are not tiny. They're farm-size. Rosmann described them as long narrow treatment strips running the entire length of the field. But the method still allows for randomization, replication and statistical analysis.

It's reliable data. "We get information on what is happening," he said. But to find out exactly why, ISU scientists are needed.

Sexy Part

When ninety extension agents toured a few PFI farms last fall, they were surprised to learn that what people call sustainable farms are not that much different from what are called conventional farms.

"Comments were encouraging," said Exner. The extension agents noted that PFI farmers were exceptional managers. But Exner knows that they

would also like economic documentation. The agents will not convince many farmers to change practices based on esthetics or moral arguments. They need numbers, especially the cost of production per bushel.

"If we can show farmers that they'll save money, that they can make this practice pencil out—that's the sexy part of sustainable agriculture," said Exner. "Do good things for the environment and make money."

But Exner realizes, "The deeper questions, the long-range questions also need to be addressed." Those are the systems questions. Most PFI research compares two specific practices in one particular farmer's system. Practically speaking, that's the way you have to go, according to Exner. "To go whole hog" and suddenly change an entire system—switching part of one's farm from a cash grain operation to a diversified one with rotations and livestock—is not feasible for most producers.

Systems research is the role of the experiment station, Exner believes. The missing element is often management. An eight-to-four, five-day-a-week farm manager working with unfamiliar equipment in

unfamiliar farming systems is "a recipe for disaster." And it doesn't help that the decision-making takes place miles away, in Ames.

"We don't know how to do systems research," said Exner. "The temptation is to give up on it. We need to rethink it." But he believes that local expertise with decision-making power must be involved.

PFI will stick with its gradualist approach, according to Exner. "We don't know exactly where our steps are going to lead us. But we have to get from where we are to where we need to be one step at a time."

Nitty-Gritty Politics

Ron Rosmann and his wife Maria farm 400 acres in a five-year rotation and have a cow-calf herd and farrow-to-finish hogs. They use small amounts of purchased fertilizer, but have been pesticide-free for eight years.

Sustainable agriculture, to Rosmann, is much more than a series of farming practices. He also listed land ownership, rural economics, health, concern for soil and water, and food safety. In his view, anybody that tries to narrow sustainable agriculture to a series of farming practices has missed the boat.

Rosmann and PFI members do what they can in the larger picture. PFI had the opportunity to be more directly involved in working to shape the 1990 farm bill. The bill could significantly affect the viability of low-input sustainable agriculture (LISA). But the PFI board of directors decided not to spread the organization too thin and "to stay out of nitty-gritty politics." They are attempting to get Iowa Congresspersons and Senators, as well as state and national agriculture department officials, to visit PFI farms, however.

Small Nucleus

In the beginning PFI ran on a shoestring. Now funding comes through the Integrated Farm Management Demonstration Program of the Iowa Department of Agriculture and Land Stewardship. State funds pay for Exner's salary and an expanded program of on-farm research and demonstrations. Since the grant expires in mid-1992, next year is the last cropping year. "It's hard to design programs on money that comes and goes," Exner said.

PFI is not a big organization, but that doesn't bother Exner. "I don't think we'll become big. We're a group for innovators and early adopters."

He cites the farm expositions as evidence. "Where are the people? Not in the tents with information. Most are where they're selling the iron. Most won't ever know about PFI," said Exner. But he believes that the small nucleus of practical farmers "can have a big influence."



Ron Rosmann

Kansas Sustainable Agriculture Conference Scheduled

Dick and Sharon Thompson, founders of the organization Practical Farmers of Iowa, will be the keynote speakers at the sustainable agriculture conference in Kansas on Saturday, November 17 in St. Marys, Kansas.

The Thompsons have farmed in central Iowa for over thirty years. In 1967 they shifted their farm away from high chemical inputs and began to experiment with alternative methods. They and other members of Practical Farmers of Iowa conduct on-farm research with ridge-till cultivation, cover crops and manure fertilizer and have sponsored farm tours for over 16,000 people in the last three years. The Rodale Research Institute sponsors the annual Fall Field Days at the Thompson farm near Boone, Iowa.

The Thompsons' opening presentation at the Kansas conference will be "Practical Farming." In the afternoon they will lead a workshop on "Economics of Practical Farming."

Jim Bender, who farms 650 acres near Omaha, Nebraska without herbicides, also will be featured. Jim's morning speech title is "Non-Chemical Weed Control." He will conduct a workshop on use of the rotary hoe to control weeds in the afternoon.

Other workshops offered at the conference will be about time-controlled grazing, legumes and crop rotations, soil conservation and compliance, biological controls and county education programs.

Eighteen Kansas organizations are co-sponsoring the conference, including The Land Institute. For information about registration, write Kansas Sustainable Agriculture Conference, Rt. 3, Box 166, Lawrence, KS 66044.

Two Paths to Sustainable Agriculture: Justification for the One Less Traveled

Wes Jackson

Janine Calsbeek's article ("Sustainable Agriculture: A Beginning in Iowa") in this issue provides us with a most positive picture of the future of sustainable agriculture. There is good news from Iowa. But also, nationwide and in scattered places around the world, there has been movement toward a more ecological agriculture in general.

Garth Youngberg, founder and head of the Institute for Alternative Agriculture, at The Land Institute conference on "The Marriage of Ecology and Agriculture" held last October, spelled out for us what has happened nationwide in the last ten years. He reminded us that ten years ago there was virtually no research on sustainable agriculture going on in this country. "Organic farming" was such a negative term that discussion between the proponents of an alternative agriculture and the so-called agricultural establishment was risky. There was virtually no recognition of the need to even begin talking.

Garth asked how many of us at that time would have thought that the U. S. Department of Agriculture would soon (July 1980) issue a document entitled *Report and Recommendations on Organic Farming*. There were 40,000 individual requests for that report, which was eventually translated into seven foreign languages. Now twenty states have enacted certification legislation for organically grown foods with many more considering such legislation. When the organic farming report was written in 1979, there were three.

Secretary Block told Garth Youngberg in 1981 that the Organic Farming Study would have no follow-up in the Reagan administration and that no money would be spent on that sort of "dead-end" research, but the 1985 Agriculture Productivity Act resulted in four and a half million dollars being appropriated for Low-Input Sustainable Agriculture (LISA). LISA has brought together land grant university scientists, extension people, farmers, administrators, and non-profit organizations. By 1989 at least fifteen land grant universities had some recognizable program in sustainable agriculture. A number of additional universities are now considering such programs or expansions in existing programs.

"The 1985 farm bill is historically significant because of its tremendous emphasis on conservation," Garth said. We would not have talked about conservation reserve, swamp buster or sod buster provisions in 1979. They were passed in the 1985 farm bill.

Youngberg recalled some pretty dark days in

1979. "I can remember how we crept around Beltsville Agricultural Research Center trying to find quiet places to meet and discuss the organic farming report to make sure it was written and published before anybody found out exactly what it said." Now sustainable agriculture has become a prominent Washington buzz expression surrounding the debate of the 1990 Farm Bill.

Minds are changing. Individual scientists are reevaluating their missions. Farmers are reevaluating how they farm.

Landmark Study

Finally, we now have *Alternative Agriculture*, a book-length document carrying the contents of the landmark study published by the Board of Agriculture of the National Research Council, an arm of the National Academy of Sciences in 1989. After praising our nation's farmers for being highly productive, the seventeen-member committee described five areas of horrible costs to our nation.

1. Agriculture is the single largest non-point source of surface-water pollution and a significant contributor to groundwater contamination.
2. Excessive pesticide residues in food products can have adverse health effects.
3. Erosion of topsoil—up to 3 billion tons/year—has seriously reduced the fertility of cropland.
4. Current farming methods require massive amounts of energy to run equipment, produce and apply fertilizers and pesticides, and irrigate arid land.
5. Agricultural subsidy and commodity programs are costly; in 1987, outlays for these programs totaled more than \$22 billion.

Considering the fact that this is likely the most prestigious scientific body in the world, their conclusions were startling. They concluded that farmers successfully adopting what they call "alternative farming practices" derive significant sustained economic and environmental benefits. Wider adoption of proven alternative systems would result in even greater economic benefits to farmers and environmental gains to the nation.

The report points out that practitioners of alternative agriculture deliberately take advantage of what nature has to offer to keep productivity sustained rather than depend upon "off-farm inputs" (fertilizer, pesticides, and irrigation water). What must be substituted for purchased inputs is, of course, more rigorous management of biological

relationships (insect pests and naturally-occurring predators), and natural processes (nitrogen fixation by plants rather than purchased commercial nitrogen). The innovative practices include:

- Crop rotations that mitigate weed, disease, insect, and other pest problems; increase available soil nitrogen and reduce the need for purchased fertilizers; and help reduce soil erosion.
- Integrated pest management (IPM), which cuts use of pesticides by greater reliance on biological pest controls, pest and weather monitoring, use of pest-resistant plant varieties, and cultivation techniques.
- Animal production systems that emphasize disease prevention through health maintenance rather than through constant feeding of low doses of antibiotics.
- Genetic improvement of crops to resist insect pests and diseases and to use nutrients more effectively.

The Land's Path

With the kind of momentum that has built in the general area of sustainable agriculture over the last ten years, why not merely extrapolate this good news into the next century and say, "Sustainable agriculture has such a life of its own, The Land Institute is no longer needed. Low input farming practices are successful, while the uncertainties of our brand of sustainable agriculture—the less traveled path—are sufficiently great that we might as well abandon the path we are on and get in step along the increasingly well-beaten road the rest of the proponents of sustainability are on." There is reason



Wes Jackson and Marty Bender plant first plot of Eastern Gamagrass, Fall 1978. Plants came from the U.S. Southern Great Plains Field Station, Woodward, Oklahoma.

to contemplate moving to that other road. My first writing about perennial polyculture featuring nature as the standard was a paper published in 1978. Two years later Friends of the Earth published my book, *New Roots for Agriculture*, which argued the need for such an agriculture. But after more than ten years, no more than a handful of researchers are doing grain-producing perennial polyculture research featuring nature as the standard. The Rodale research farm did work with perennial grains for a while and just this past year, dropped the project. They did not do research on polycultures, and to work on perennial crops and not polycultures is to have missed the point. What's wrong? Is there any justification for our continuing, other than that it provides checks for around twenty-five people each month, including ten interns who spend forty-three weeks in our education-research program?

Such a question about the need for our work, given the movements over the last ten years and the fact that so few scientists have developed a research agenda based on our paradigm, requires a restatement of the need for this brand of agriculture.

In *New Roots for Agriculture*, I described what I call "the problem of agriculture" as a consequence of humans taking control over their food production and thereby generating what has amounted to a fundamental break with the ecological context that shaped us. I called this the "fall of the human" and cited four categories of failures on our part to arrest the damaging ecological consequences of this break, most notably soil erosion, but in more recent times, chemical contamination of soils and water plus a growing fossil fuel dependency. I described the failures of history and prophecy, the failures of organizations, stewardship and success.

I can do no better than to state the original argument by quoting a summary of it from the introduction to *Altars of Unhewn Stone* (1987).

The Four Failures

During the late 1970s I examined much of the record of soil abuse around the globe to learn how extensive the effort has been over the centuries to warn humanity about the consequences of erosion. I thought perhaps there were not enough people sufficiently enlightened or passionate to call adequate attention to the problem of soil erosion. But the record seems clear and, for all practical purposes, complete. Prophet and scholar alike seem forever to have lamented the consequences of wasteful farming. In the Bible, Job warned that "the waters wear the stones" and "the things that grow out of the dust of the earth" are washed away, leading to the eventual destruction of "the hope of man." Plato called attention to the "mountains in Attica

which can now keep nothing but bees, but which were clothed not so very long ago, with . . . timber suitable for roofing very large buildings. . . The annual supply of rainfall was not lost, as it is at present, through being allowed to flow over the denuded surface to the sea. . . ." The native American leader Tecumseh, in a speech full of fire and vengeance, exhorted his people to return to their primitive customs, to throw aside the plow and the loom, and to abandon the agricultural life. He warned that white men would subject them to servitude after they had possessed the greater part of their country, turned its beautiful forests into large fields, and stained their clear rivers with the washings of the soil. The eighteenth and nineteenth centuries were filled with warnings from the enlightened, impassioned, and articulate. But while we have seen improvement here and there over time, on the whole, the problem has grown worse.

In thinking about the second great failure, the failure of organizations, I wondered how the Soil Conservation Service (SCS), after nearly fifty years in existence, can have so totally failed to reduce soil loss to amounts that can be replaced annually. In fact, soil loss in the U.S. is much greater now than when the energetic and imaginative Hugh Hammond Bennett established and staffed the SCS with men and women, from office workers to Ph.D's in soil science, dedicated to the common task of saving soils. Wellington Brink said that never in modern government has there been an organization with more *esprit de corps* among the workers. There was good intention at every level, an abundance of passion about the problem, and the funding for programs to carry it out. The SCS built tens of thousands of miles of terraces, prepared demonstration plots and hosted field days. One two-day program held on two adjoining farms in southern Ohio attracted 80,000 people! And the SCS had help from private organizations—for fifteen years a strong citizens' group worked alongside it. They called their private organization Friends of the Land, published an attractive quarterly and advertised themselves as a society devoted to the conservation of soil, rain, and man. They disbanded in the mid-1950s, but during their active tenure, nearly all the great names in conservation contributed to the organization and the quarterly. Here was an organization that failed to sustain itself, let alone solve the problem. The sad verdict is that public and private organizations have failed to stop soil erosion.

Though I count the efforts of the SCS to

be a failure, I do not mean it should be scrapped. In fact, it should be enlarged, as a matter of national defense. Imagine how much the nation's soils would have deteriorated without such an effort.

I identified the third failure, the failure of stewardship, after I had seen soil erosion even on Mennonite and Amish fields. This was particularly disappointing, for the people of these closely related religions believe there is no higher calling of God than to farm and to be good stewards of the land. They take seriously the biblical injunction to "dress and keep the earth." Within the context of till agriculture, they are the most ecologically correct of all major groups of farmers in the U.S. Observing erosion on their lands, I have wondered if it may be beyond our ability to achieve a sustainable agriculture century after century, if till agriculture is its main feature.

Success may be the worst of the four failures, simply because we learn very little when all goes well. It has been argued that farmers can't be expected to take care of their land without good prices. While there is truth in that argument, high prices have not guaranteed wise farming. During the few periods when prices *have* been good, erosion has remained a serious problem. When Secretary of Agriculture Earl Butz told farmers to plow fencerow to fencerow in anticipation of a huge export market, they did, with the result that hedgerows and shelter belts were bulldozed. The worst part of it is that high yields give us the illusion that all is well on the farm: even as soil is being lost, yields climb; as pesticides and fertilizer accumulate in the soil and groundwater, yields climb; as the fossil-fuel energy cost per acre of production escalates, yields in every major crop go up. Even though low prices due to overproduction have contributed to the modern debt crisis on the farm, production remains the bottom line. Unfortunately, success in producing food tends to blur the cost in ecological deterioration and in the depletion of fossil energy resources. High-production yields numb us to the understanding that all of these costs must eventually be reckoned with

The Long View

I invite the reader to place those five preceding paragraphs which outline four great failures alongside the positive events of the last decade described earlier. The four failures describing "the problem of agriculture" are embedded in a long historical and prehistorical view, spanning ten thousand years, not the last ten. Soil erosion is currently in decline on our highly erodible and generally poorer soils, but

mostly due to the conservation reserve program, which any fool knows would never have passed had there not also been an incentive to reduce production to achieve higher prices. What will happen if wheat goes to six or seven dollars a bushel and corn the same? Soybeans \$20.00? Remember Earl Butz's statement about plowing fence row to fence row and how all the shelterbelts were bulldozed out *following that one remark*.

We can see some of the wonderful spirit of the early Soil Conservation Service in the current reawakening. But for the purpose of comparison, what would we do today if 80,000 people were to pay a two-day visit to Dick and Sharon Thompson's farm in Iowa (see Calsbeek article) as happened in southern Ohio in the 1940s? We promoters of sustainable agriculture would fall all over ourselves declaring a new era. Even though many good things have happened, we still have to count the last decade as one of the countless blips in the history of agriculture, which must go back at least to Job and Plato.

Here is my larger point. With all of these recent successes in low-input agriculture, we must acknowledge that there will be an *upper limit* in our attempts to save soil, reduce the chemical assault on our soils and water, and reduce fossil fuel dependency with till agriculture. This is especially true if we forget or ignore the need to move the larger economy, of which agriculture is only a part, away from an emphasis on *extraction* to an emphasis on *renewal*. This requires a shift in how we think about the world, how we regard our relationship to nature. Sustainable agriculture will not be achieved with the likes of better input-output modeling where extension workers teach farmers about "smart management of our agricultural resources." That's part of the old paradigm.

Ecological Context

The recent marriage of ecology and agriculture has produced the still immature hybrid called agroecology. I have great hopes for agroecology, not only as a discipline unto itself but for the possibilities it suggests to get us on a path away from an extractive economic order in which agriculture finds itself embedded. It may be a bit whimsical on my part, but since the break with nature came with agriculture, it would be fitting that agroecology help with the fusion of ecology and a brand of economics that nests well with ecology. But agroecology has a very long way to go and will have but modest improvement in maturity within the current world view.

As matters now stand, the basic perception of both the run-of-the-mill agriculturist and the run-of-the-mill economist is the same and, bluntly, stated, both perceptions will have to be swept eventually into the dust bin of history. I think that can happen.

Perceptions can change. A small amount of progress has been made by a few economists and agriculturists already. Most notably, Herman Daly has inspired a few economists to think in terms of an economics of renewal. A small but growing minority of agricultural researchers are willing to think about our crops and livestock in unconventional ways. They are willing to consider where our domesticated plants and animals spent most of their evolutionary history and are willing to move their minds away from regarding these plants and animals as exclusively human property. By acknowledging that our domesticated plants and animals are descendants of wild things which had a long evolution in a context that was not of our making, we are able to think more in terms of relationships. The ancestors of most of our crops were most likely colonizing species—weeds. These weedy ancestors were usually the first invaders of disturbed ground. In a certain sense they were the enterprisers of the landscape. This is a sobering thought, for essentially all of our major crops, after 10,000 years of domestication, are still dependent upon exploiting environments of recent disturbance. If, indeed, a major disturbance every year is locked in as the reality for most of our highly productive agricultural acres, the eventual outcome for humans on this planet will be tragic. This is the reason The Land Institute looks to slightly more mature ecosystems where perennials are featured, where major disturbance is not annual.

As I mentioned, the common world view is not limited to crops alone. It includes our domesticated animals. I look forward to the day in which animal science experts and farmers, and for that matter consumers, will think of the chicken as fundamentally a jungle fowl rather than primarily property, which grants us implicitly a license to confine it in a small cage to produce eggs or meat. I hope we can all one day see the hog as a forest animal and therefore not just a pin cushion for needles squirting antibiotics which close confinement requires. Both beef and milk cows had their origin as grazers in savanna-like conditions, not feedlot critters or milk machines designed to eat like a hay baler.

Mental Shift

Because our reference point at The Land is nature's prairie, the application of our technological array and scientific know-how is subordinate to a standard that features neither efficiency nor production. It is not that we are uninterested in efficiency or production as we go about our daily work; in fact, a visitor may not be able to see our motions as different from the motions and patterns of other agricultural researchers. We work in a fancy greenhouse under careful temperature control in late fall, all winter long and into the spring. Here seeds germinate and grow and numerous pollinations are made. We work in



Interns and research staff discuss the leymus experiment: (l. to r.) Jon Piper, Todd Francis, Paul Muto, Doug Romig, Jean-Luc Jannink, Tracy Noel, Tamara Kraus, Kris Schaefer, Peter Kulakow, Kathy Collmer, Berni Jilka.

orderly experimental plots in the field. But as the breeder pollinates, the pathologist evaluates damage and the ecologist dopes out certain soil-root interrelationships, standing firmly in the background is that never-plowed native prairie whose living community is under continuing scrutiny.

I could restrict the argument to life forms, but the fact is it isn't just the living world we are talking about here in this mental shift. It is all of nature. Think about water in terms of a proper relationship, for example. With water, we can apply the same principle that guides our thinking on how to treat livestock. It is the ecological context which remains foremost. It is one thing for a farmer adjacent to a stream to divert a small quantity of water to irrigate a few acres and quite another for a stream to become acre feet delivered in a 400-mile long corridor of pipes and ditches to Los Angeles. The question is whether the stream, as an ecosystem or part of one, can experience or "enjoy" streamhood. It is analogous to a few trees being removed from a woodlot to become useful lumber rather than clear-cutting, which turns the woodlot into board-feet—a commodity. Acre-feet and board-feet are the same—resources.

The ecological perspective, in other words, honors *jungle fowl*, *forest* animals and *savanna* grazers—and in the future, I hope, domestic *prairie* seeds. I emphasize the adjectives because the adjective in these four cases is the ecosystem which describes the relationship of the larger system to the creature. The ecological perspective honors the woods and the stream, the tropical rain forest, and

the North American prairie. As we move toward the larger notion of relationship or context, the word "resources" becomes obscene.

I seriously doubt that the Department of Agriculture or the National Academy of Sciences or the U. S. Congress will soon move from the notion of "smart resource management" to the notion of relationships which conjures up images of ecological context. Nearly all sustainable agriculture research and practice is devoted to the human becoming smarter than in the past. What we are really after is to draw on the "intelligence" embedded in the ecological context which goes far beyond whatever "smart" capabilities the human can muster.

We have said around here that we are working on perennial polyculture for grain production. I have never been quite comfortable

with the expression and usually lace the phrase with humor when saying it aloud. I have done this almost unconsciously because the expression carries a certain "smartness" and emphasizes our clever agonomic arrangement which forces us to feel more informed than we deserve to be. It has never captured the spirit of what we are about. Saying that we are out to build a domestic prairie featuring grain production shifts the focus from us to nature as the reservoir of intelligence. Attention is then drawn away from us as major agents of manipulation, and we acknowledge that we are students of nature who are bent on discovery, students who want to build



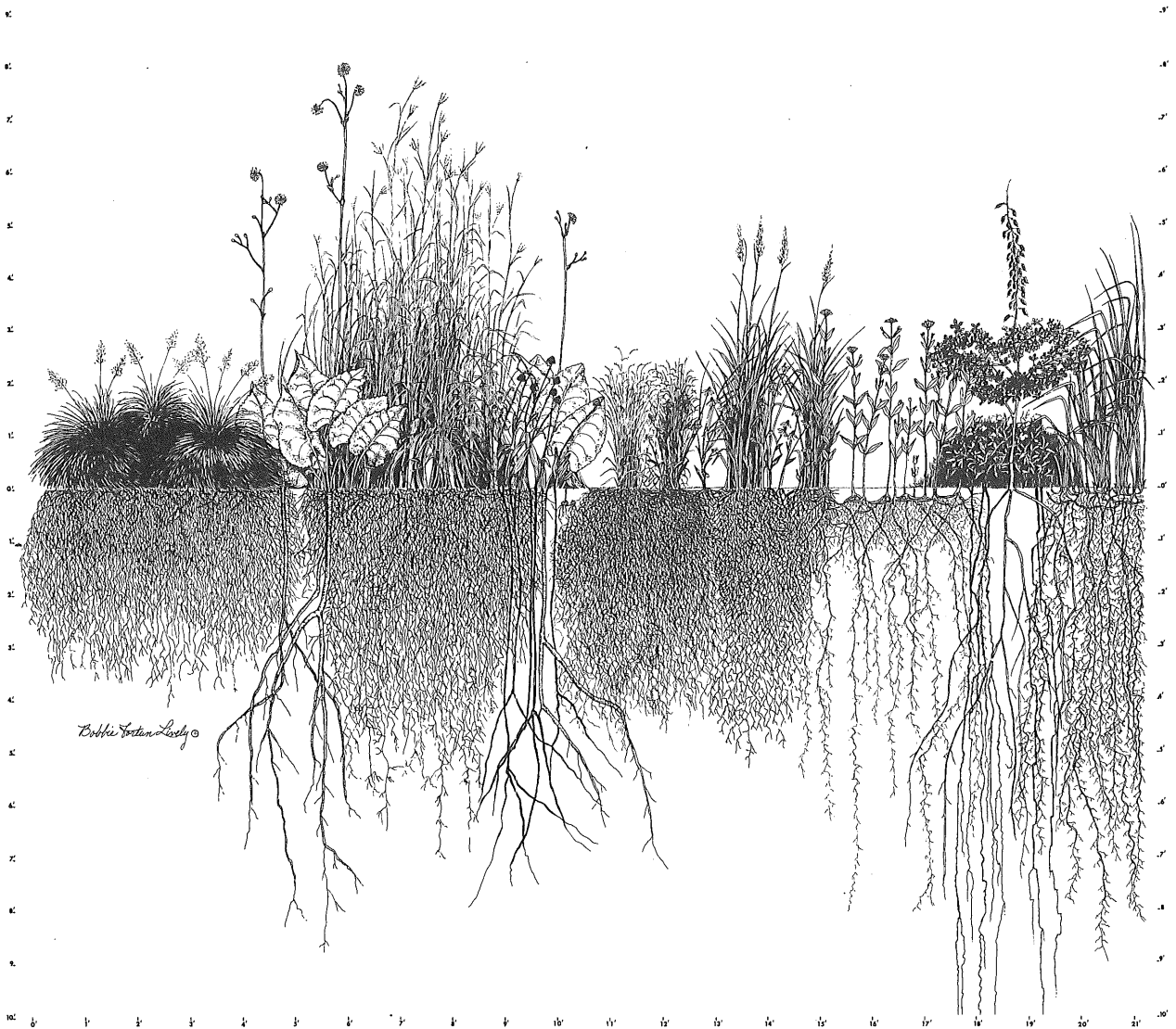
Berni Jilka and John Jilka whitewash The Land's greenhouse to prepare for the summer sun.

arrangements that imitate the current local results of a long evolutionary process.

The two questions—"What was here? What will nature require of us?"—are questions raised in the 1978 paper I mentioned earlier and in *New Roots for Agriculture*. They still dictate the terms of The Land Institute's research agenda. As we receive answers to these two questions, we gain insight into a third implied question articulated by Wendell Berry, "What will nature help us do here?" I doubt that agricultural researchers or farmers, maybe all the way back to Plato and Job, asked such questions. If all agricultural species, from corn plants to Holstein cows, are regarded as the property of humans rather than relatives of wild things that had most of their evolution in a context not of our making, then the best we can hope for is to become "smart resource

managers." From my point of view, that's too limiting to prevent soil erosion, or, for that matter, any other desecration of the agricultural landscape, or, ultimately, of us humans.

So—we cheer the progress being made by Iowa farmers who are adopting practices that are less harmful to the soil and water. Yet we know that for agriculture to be sustainable, we must make a mental shift in how we see the world. Sir Albert Howard said we should farm like the forest. He might just as well have said that we should farm like the prairie. Our work to develop several domestic mimics of the prairie mosaic signals our willingness to step out of the "smart resource management" paradigm into a world into which we set out to discover the best fit with nature, both agriculturally and economically.



Drawing by Bobbie Lively. Used as the cover illustration for *New Roots for Agriculture*

Lost in the Garden

Dana Jackson

It's three o'clock in the afternoon, and after sitting at my desk for two hours, editing an article, sorting the mail, answering phone calls, I am restless and fidgety. It's time to move the water sprinkler in the garden and get some exercise.

A blast of 98 degree F hot air greets me when I walk out the east door of the classroom and step into the herb and flower section of the garden. As I stare dejectedly at the multitude of grasshoppers leaping from the defoliated yarrow to the oregano, my eyes catch some clumps of crabgrass and bindweed near the birdbath by the pink and blue delphinium. I pull them up and notice the scraggly rotting stems and foliage of borage sprawling over the calendula. Soon a pile of hollow brown stems and large rough cucumber-scented borage leaves cover the small pile of weeds on the path. I need a wheelbarrow to haul them to the compost pile.

On my way to get the garden wheelbarrow, I notice how profusely I am sweating and remember that I left the office to move the water sprinkler. I must disconnect the sprinkler in the cantaloupes to attach it to a hose that will reach the next section, the watermelons. Several times I turn the water on and off until the rain wave breaks at just the right place. My shirt gets wet as I jump back and forth to adjust it. Immediately I feel refreshed, cooler.

I notice that the okra next to the melons still could use some thinning, so I pull up a few of the foot-high, itchy plants to leave a spacing of nearly two feet between individual okra plants. Will the wilt kill the okra this year? It still looks good, though there are a few yellow leaves close to the ground. I hope we get enough okra to make okra pickles.

Wilt is such a problem in this garden. I wonder if it has affected the cantaloupes much? I've already pulled up one wilted watermelon plant. I walk back to the cantaloupe patch, pausing to look at the honeydew melon plants on the way. These took forever to germinate. I wonder why the melon seeds in the compost that we spread on the bed of leeks germinated so vigorously and soon covered the bed with volunteer cantaloupes and watermelons. One of the interns did not know that sprigs of grass-like leeks had been transplanted there, and he mulched the bed as if it had been intended to be a melon bed. Well, it really wants to be a melon bed, I thought. We'll plant leeks next year.

The cantaloupes still look fairly healthy. Some

leaves are drying up and look wilted near the main stem, but I don't see any cucumber beetles yet.

Oh, yes, I need to get the wheelbarrow to pick up the pile of borage plants and weeds back in the herb garden.

On my way back with the wheelbarrow, I pause to look at the garlic and onions. It's about time to harvest them. In fact, I could use some garlic for dinner tonight. I leave the wheelbarrow and go back to the tool shed to get a spade. I don't want to risk pulling stems off the garlic bulbs even though the soil is soft, so I push the spade down by a garlic stem and lift a bulb with nice large cloves. The exposed earth smells good. One clove will fit just right into the garlic press. I dig another, and another. Might as well dig up all the garlic bulbs in this bed. Might as well put them into the wheelbarrow and take them to the porch for storage.

I remember the red paper-covered wire that I've taken off loose heads of lettuce and spinach purchased at the grocery store in the winter. If I get those from the drawer in my kitchen, I can tie up the garlic by the stems and hang bunches on the west porch by the interns' kitchen. They can take garlic home or use some here when they cook lunch.

The smell of garlic is wonderful, especially if you have a garden producing shiny purple eggplants, basil, onions, tomatoes and red Italian peppers. Thinking about the combination, I can almost smell olive oil. Land people use a lot of garlic. We must remember to save some cloves to plant this fall.

When the wheelbarrow is empty again, I remember the pile of weeds and borage and again aim for the path. A few armloads and I have the wheelbarrow filled, so I push it back toward the compost pile. There's the spade I used to dig garlic. Since we expect everyone to put away tools, I'd better scrape the spade and return it. While in the tool shed, I separate and straighten a jumble of hoes by the door.

Finally, the weeds are dumped on the compost pile and the wheelbarrow pushed back to its storage spot. The sprinkler isn't watering one hill of Crimson Sweet watermelons thoroughly enough, so I adjust the sprinkler one more time before going back into my office. I don't mind getting a little wet, but the spray hits me in the face, catching me by surprise.

I walk through the tomatoes back toward the building. The indeterminate Early Girls are branching out through the concrete wire cages, and they will soon flop out into the path, so I start pulling the branches back into the cage. My arms and hands turn green. There's an orange tomato — and another, and another. It won't be long now until we can

have plenty of table tomatoes. Oops, bare stems tell me that a tomato hornworm is at work here. Hornworms look so much like tomato plant stems—I have a hard time finding the busy glutton. When I do, the monster—almost a half inch in diameter and nearly two inches long—clings to the stem as I pull him off. I quickly drop the wiggling hornworm on the ground, step on him, and look the other way as I grind digested tomato leaves into the straw mulch.

On down the path is the cucumber patch with a row of blooming leeks in the middle. Thom Leonard casually asked in March when we were cleaning up the remains of last summer's garden, "Why don't you leave a leek or two to bloom?" I decided to leave the whole row. Now four foot-tall stalks rise out of Pickler and Straight-Eight leaves. Are those grapefruit-size lavender blossom balls on top real, or are they Dr. Seuss book illustrations? The honey bees and wasps hovering around testify that the flowers are real. I pick three large, too-mature yellow cucumbers and discard them on the path, as the blue truck pulls up into the parking lot. Four interns jump out of the back—finished for the day hoeing research plots at the farm on Ohio Street. Finished?! That means that it must be past 4:00 P.M. How can it be? I just left my office a few minutes ago to move the water sprinkler!



Praises

The vegetables please us, all modes and virtues.

The demure heart

Of the lettuce inside its circular court, baroque ear
Of quiet under its rustling house of lace, pleases
Us.

And the bold strength of the celery, its green Hispanic
!Shout! its exclamatory confetti.

And the analogue that is Onion:
Ptolemaic astronomy and tearful allegory, the Platonic circles
Of His inexhaustible soul!

O and the straightforwardness
In the labyrinth of Cabbage, the infallible rectitude of Homegrown
Mushroom

Under its cone of silence like a papal hat--

All these

Please us.

And the syllabus of the corn,

that wampum,

its golden

Roads leading out of the wigwams of its silky and youthful smoke :
The nobility of the dill, cool in its silences and cathedrals:
Tomatoes five-alarm fires in their musky barrios, peas
Asleep in their cartridge clips,

beetsblood,

colonies of the imperial

Cauliflower, and the buddha-like seeds of the pepper
Turning their prayerwheels in the green gloom of their caves.
All these we praise: they please us all ways: these smallest virtues.
All these earth-given:

and the heaven-hung fruit also. . .

As instance

Banana which continually makes angelic ears out of sour
Purses, or the winy abacus of the holy grape on its cross
Of alcohol, or the peach with its fur like a young girl's--
All these we praise: the winter in the flesh of the apple, and the sun
Domesticated under the orange's rind.

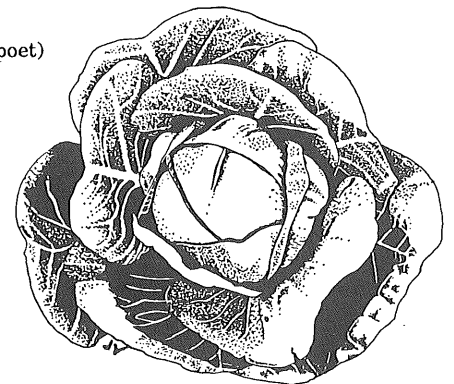
We praise

By the skin of our teeth, Persimmon, and Pawpaw's constant
Affair with gravity, and the proletariat of the pomegranate
Inside its leathery city.

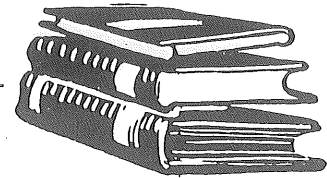
And let us praise all these

As they please us: skin, flesh, flower, and the flowering
Bones of their seeds: from which come orchards: bees: honey:
Flowers, love's language, love, heart's ease, poems, praise.

By Thomas McGrath
(reprinted by permission of the poet)



Books



Healing the Wounds: The Promise of Ecofeminism

Edited by Judith Plant

Foreword by Petra Kelly

New Society Publishers, Philadelphia, Santa Cruz, 1989. 262 pages, paper.

Reviewed by *Colin Laird*

To live in a more equitable and peaceful world, we need to listen to the interpretations, criticisms and visions of those members of society who have been subjugated by the dominant culture. These "others" in human society are the women, the minorities and the poor. These "others" will be an important source of wisdom as we move towards a sustainable future. Too often, these sources have been silenced or ignored by people in the positions of power. It has been assumed that what is appropriate for the dominant culture—white middle- to upper-class males—is appropriate for all. A few have challenged these assumptions throughout history, and as we enter the last decade of the twentieth century, voices calling for change grow louder and more articulate.

In most cultures around the globe women are the unquestioned or accepted "others". Having few or no rights, they have felt the brunt of a male-dominated society; they are still at the bottom of a hierarchical social structure. It is the current imbalance inherent in the male/female relationship that sets the tone for our other relationships. The domination of the "other" is consistently repeated in our relationship with minorities, with the poor and with the natural, nonhuman world.

I read *Healing the Wounds: The Promise of Ecofeminism* by Judith Plant because of my interest in sustainable agriculture. Sustainable agriculture calls for a revision of how we see ourselves living on the land. This revision rejects the dominator model so pervasive in our current agriculture. It adopts a partnership model. It advocates a dialectical or interpenetrating relationship in which both the land and the people on it benefit. By thinking about these issues in conjunction with the class discussions on the feminist perspective that have occurred at the Land, I decided to read some works of feminist writers to learn how they view our relationship with the land.

Ecofeminism is a word that I was not familiar with before reading Judith Plant's book. I found the

word intriguing, and, to a certain extent that is the point. As she explains, "connecting feminism to environmentalism is an eye opener to many who might otherwise not have been able to listen to either issue. Taking the feminist critique of human relationships and putting it side by side with an analysis of human and nonhuman relationships, showing that both women and the earth have been regarded as the objects of self-interested patriarchs, is making a lot of sense to a lot of people."

A unified social criticism is needed if we are to create better social, political and economic environments in the future. Too often, social criticisms lack a whole vision that would make them truly challenging to the dominant social order. Ultimately, a powerful social criticism will point the way toward different alternatives. It will provide a starting point from which individuals and groups of people can act out their visions of a better world.

The union of environmentalism and feminism may be insulting to some and ridiculous to others, but it is also a way to strengthen the arguments of each. Familiarity with a mode of thought can blind us to the inconsistencies within it. In having to explain our position to people with different perspectives, we can expose those inconsistencies and strengthen our arguments by dealing with them.

This union between feminism and environmentalism is another step in the search for a more holistic and coherent understanding of our problems and what we can do to solve them. It is similar to the joining of economics and ecology that we find in the works of E. F. Schumacher, Hazel Henderson and Herman Daly. We can no longer afford to divide ourselves up like so many departments in our universities or governments. By bringing different perspectives together, we have a better chance of understanding the extent of our problems.

Therefore, *Healing the Wounds* is not just the title of this book. It is what Judith Plant believes ecofeminism is all about—healing. It is a way to heal the wounds that we all have and work toward a society in which the wounds that we inevitably inflict on one another are dealt with openly, do not reoccur, and are kept to a minimum. It has the promise to make our split society whole again.

This book is a collection of essays by such prominent feminist writers as Susan Griffin, Ynestra King, Dolores LaChapelle and Ursula LeGuin. One of the main strengths of the book is the number of different writers represented (over 25) and their

mixed social and cultural backgrounds. I found it extremely interesting to read works by women of color and of developing nations. Ms. Plant realizes that non-western perspectives are important, especially if we, as Westerners, are intent on "helping" other countries.

The book is divided into four sections, all of which give the reader a sense of what it is like to view the world from an ecofeminist perspective. Whether the examples or stories be about community, civil disobedience or survival, expressed through prose, poetry or dialogue, the message of ecofeminism is clear.

- We need to restructure society along ecological and feminist principles and challenge the nature/culture dualism of human society.

- A healthy, balanced ecosystem, including human and nonhuman inhabitants, must maintain diversity. Biological simplification, i.e., the wiping out of whole species, corresponds to the homogenization of taste and culture through mass consumer markets. Therefore, we need a decentralized global movement that is founded on common interests yet celebrates diversity and opposes all forms of domination and violence.

- Life on earth is an interconnected web, not a hierarchy. There is no natural hierarchy; human hierarchy is projected onto nature and then used to justify social domination. Ecofeminist practice is necessarily anti-hierarchical.

- Ecofeminists take on the life struggles of all nature as their own.

Ms. Plant is quick to point out that this anthology in no way completely represents the wide spectrum of thought that is ecofeminism. She believes it does begin to define a truly international movement that has the power to radically transform our perception of ourselves and our place in the natural world. By organizing the book to deal with our world view, politics, spirituality and community, Ms. Plant recognizes that it is in these areas that we must work to make change occur.

In the first section, which discusses the meaning of ecofeminism, Susan Griffin describes how we live in a split culture, one divided against itself. She explains how the subject/object dualism promoted by the scientific establishment has become so ingrained in our psyche that we no longer think of or refer to ourselves as part of nature. We have falsely separated nature from culture and subtracted all meaning and worth from it except as something for "man's" use.

In our effort to control nature for our own well-being and security, "man" confronts the irony of modern existence. What are we trying to control? Nature? Ourselves? Griffin describes how the domination of the "other" stems from fear, the fear

that the dominator is similar to the "other" and in no tangible way better. Our society has invented the delusion of power over nature in order to feel safe. In reality, we are afraid of fear itself.

In the section on ecofeminist politics, Anne Cameron argues that when we talk about basic rights (so popular in this country), we should include our right to live on this earth. "We have a right to be free and to live in balance in nature, not apart from nature." We are encouraged by her to look at the way our society operates and ask the questions: "Who benefits?" and "Is it an accident?" In this way we can see how white male culture is preferentially treated. For instance, in Vandana Shiva's essay on "development" for poorer countries, she talks about "development" as a new project of the Western patriarchy, no better than the colonialism of the nineteenth century. Development schemes are based on the Western males' view of what the non-Western world should look like and how it should operate. It is a view based on exploitation of women, nature and other cultures. Who benefits? Shiva maintains that it is more often the West that benefits, not the poorer countries. Is it an accident that "development" schemes are set up this way? Shiva doesn't think so.

Writers in the section on ecofeminist spirituality explain that we need to rise above the hierarchical chain of being and chain of command common in theological teachings. Goddesses, Gods, Creators are part of each person, plant and animal. "Immanence takes the place of transcendence."

According to Rosemary Radford Ruether, in the process of converting our minds from the heavens to the earth we must convert ourselves to each other. There can be no ecological ethic simply as a new relation of "man" and "nature." Any ecological ethic must always take into account the structures of social domination and exploitation that facilitate the domination of nature and that prevent concern for welfare of the whole community in favor of immediate advantage for the dominant class, race and sex. An ecological ethic must always be an ethic of ecojustice that recognizes the interconnections of social domination and the domination of nature.

In the last section, ecofeminist community, we find out where the changes in world view, politics and spirituality take place. It is within the community that all our work becomes worthwhile. We are social animals, and it is in community that we struggle, fight, celebrate and rise above our fragile selves. We meet our deepest needs in community and act out the values we espouse. But under patriarchy, the ways in which we live together have been oppressive and harmful to people and the earth. It is in creating a new social fabric based on valuing differences and the interdependence of all life that we face one of our greatest challenges.

Intern Directory 1990

There is a perennial polyculture always present but not often thought of as such at The Land Institute: the interns. Every year since 1976 the efforts and ideas of a changing group of dedicated folks have fertilized the research, discussions, and form of The Land, and, as a reading of the following directory shows, they have left here to live extra-ordinary lives.

Seventy percent of the prairie is underground, invisible but surely the stuff of vitality and renewability. Similarly, the "stuff" of these 105 interns and students can't be seen by a look at the few lines describing each. The invisible part — family details, landscapes lived on and with, histories, hopes — must be considered.

Thanks to all who replied to our requests for news, and apologies to those we never caught up with. Apologies, too, for any mistakes. They are solely mine.

- J.V.

MICHELE ADAMS 1977 Waxahachie, TX
Child Development Specialist for the State of Texas, Department of Human Services. Monitors child care centers (up to age 12) for program quality. "It's very interesting and refreshing to look at the world through a child's point of view."

PAUL ADELMAN 1984 Ann Arbor, MI
Getting a law degree and a master's degree in Natural Resources at the University of Michigan. Recently married. "I miss TLI greatly: think about it a lot. Hang out with Kirk Riley and reminisce endlessly." Married May 12 to Kate Gaird.

BROOKS ANDERSON 1989 Hamden, CT
Coordinating the University of Wisconsin-Madison's College Year in India Program as on-site monitor for students. "I enjoyed reading Ed Abbey's distinction between culture and civilization. 'Culture,' he said, 'is Christ turning water into wine. Civilization is Christ walking on water.' It's an observation I'm still considering." Planning to do graduate work in Rural Sociology.

HELEN ATTHOWE 1983 Medford, NJ
Director of the Watershed Experimental Farm, doing research on organic apple production methods. Recently accepted a partnership in an IPM consulting firm in Washington state. Her partner Wayne Halozan is manager of an Environmental Chemistry Mobile Lab and a NJ-NOFA board member.

DENISE ATTWOOD 1982 Spokane, WA
Working with craft producers in Nepal and selling their products in the Northwest. "Two years ago we bought 10 acres of land and finally this year we're ready to break ground and build a small house."

NANCY BAUMEISTER 1989 Corvallis, OR
"I'm almost half-way through a master's degree in Soil Microbiology at Oregon State University, doing research on where the nitrogen in manure goes; into plants, soil, drainage water, groundwater, or atmosphere. I like science."

MARTY BENDER 1978 Lexington, KY
A graduate student at Univ. of KY, Lexington, working on a Ph.D. in plant ecology. "In my 6th year here — Hey! That's longer than I was at the Land Institute!" Married and has a baby boy.

LAURA BENSON 1988 Gays Mill, WI
After her internship worked in South Dakota with the Nature Conservancy, then lived for a while in Minneapolis, Minnesota before going to China (her third time) where she taught English. Traveled in China with Randy Kempa ('87).

MIKE BERGHOF 1984 Grand Rapids, MI
Mike is a therapist at a substance abuse counseling agency, and will soon be chief of clinical staff there. Both he and his wife Helen, a nurse and educator, will probably return to school. They have two children.

MARK BIGELOW see Cici Pfingston

TOM BIRT (MOORE) 1978 Kansas City, KS
Teaches junior-high gifted kids in Olathe, KS. Started a school-wide paper recycling program. "One wife, two kids, one vasectomy."

PATTI BOEHNER 1987 Lincoln, NE
Working at the University of Nebraska-Lincoln as an Assistant Instructor in Crop Production and concurrently working on a Ph.D. Helped put together a poster on Women and Sustainable Agriculture two years ago, which is still being used at gatherings around the country. Married to Bahman, who has a post-doctoral position at UNL.

PATRICK BOHLEN 1986 Columbus, OH
Enrolled in a Ph.D. program in entomology at Ohio State University and working on a degree in agroecology. "I have co-founded a small but outstanding graduate student group in sustainable agriculture. There are worms in my kitchen turning table waste into soil. I will someday be happily married to Julie Mitchell, a fine artist from Ohio."

MARK BOHLKE 1983 Kutztown, PA
Agronomy Research Technician at the Rodale Institute and studying chemistry at Kutztown University.

LOIS BRAUN 1985 Crossville, TN
For the past three years a Peace Corps volunteer in Lesotho, last year as a supervisor, working in village and school gardening programs. Now plans to travel America, looking for the right place to grow things.

RUSS BREHM 1976 Hope, KS
Has lived 10 years with Pat and their two boys 30 miles east of Salina, and bought 80 acres of native pasture last year. Raises hay, sheep and cattle. Russ is Maintenance Director at Rock Springs 4-H Center.

STEPHANIE BROCK (summer student, 1979) Wallace, KS
Retired from teaching while raising two children. Instrumental in starting Mt. Sunflower University for Higher Education, Under the Cottonwood, Inc., the Ft. Wallace Cafe, and the Wallace County Farmers Market. Married to David Lock, two children.

JEFF BROWN 1978 Manhattan, KS
Operates a guided voyageur canoe trip service, "for people who want to paddle a 26-foot historic replica canoe." Involved in the formation of the Kansas Living History Association last January. Married Kathleen Herndon on the first day of spring, 1987.

MARY BRUNS 1985 Washington, DC
An analyst at the Office of Technology Assessment, in the Food and Renewable Resources Program. Recently completed "Beneath the Bottom Line," a report on agricultural approaches to reduce agricultural contamination of groundwater. Will enter graduate school at Michigan State University this fall in microbial ecology.

DAVID BURRIS 1983 Haymarket, VA
Presently a Sanitarian for the Fauquier County Health Department.

BRAD BURRITT see Danielle Carre

PERRI BUTLER see Rob Peterson

JANINE CALSBEEK 1984 Orange City, IA
A part-time writer for the local weekly newspaper, the Sioux County Capital-Democrat, where she received an award for her series on AIDS. She "spends most of her time at home with son John, hanging diapers on the line." Married to Doug.

DANIELLE CARRE & BRAD BURRITT 1985/86 Hotchkiss, CO
Raising 2 1/2 acres of vegetables and flowers at Sage Farms and building a house. "We will probably get more involved in alfalfa, small grains, and orchards. I hope there will be something sage about our farming." One son, Ian.

MICHEL CAVIGELLI 1985 Manhattan, KS
Worked with the Kansas Rural Center, and co-wrote "Sustainable Agriculture in Kansas: Case Studies of Five Organic Farms." Now studying at Kansas State University. Is a member of the Kansas Citizen's Committee on Sustainable Agriculture. Will start a Ph.D. at Michigan State Univ. this fall, in the Center for Microbial Ecology.

MIKE CHAPMAN see Deb Parks

TOM CLEMETSON 1988 Lanoka Harbor, NJ
"Involved in organic burdockculture in the coast range of Oregon at Wintergreen Farm and, later, in search of the perfect tortilla (and tortilla maker) in the Sierra Madre del Sur, Mexico. He now resides at the Jersey Shore in quest of gainful, ecofriendly employment with health insurance benefits."

ALISA COFFIN 1982 Cambridge, MA
For the last three years has been in Haifa, Israel, working as Assistant to the Director of the Gardens Office of the Bahai World Centre. In September will start a Master's of Landscape Architecture at the Harvard School of Design. "I also plan to get married on 1 September to Walter Rojas."

MICHAEL COLLINS 1986 Dix Hills, NY
Finishing a master's degree in Landscape Architecture at Syracuse, by working on a regional planning project at an archeological site and village on the Yucatan Peninsula.

JOHN CRAFT 1977 Gypsum, KS
Married last year to Dorothy Goertz, then moved with their 4 kids to a farm house east of here. John is presently operations manager at The Land and Dorothy an RN in Salina. Says John, "being with the good people of The Land, whether staff, interns, or visitors, provides adequate incentive to perform the necessary 'grunt work.'"

PAMELA CUBBAGE 1989 Putney, VT
Finished an internship in gardening/farming at The Putney School, and is now co-managing a Community Supported Agriculture (CSA) farm.

JENNIFER DELISLE 1988 Red Wing, MN
Worked for The Nature Conservancy at the Nachusa Grasslands prairie restoration project in 1989. Presently is counselling mentally handicapped adults, to help them move from group homes and live independently in the community.

DOUG DITTMAN 1987 Lincoln, NE
Has two titles at the Nebraska Sustainable Agriculture Society: (1) On-Farm Research Coordinator and (2) Graduate Research Assistant. Funding is from USDA LISA money. Doug works full-time summers and half-time during the school year while pursuing his master's.

PAT DREESE 1978 Battle Creek, MI
Working for Kellogg's and living with wife Lynn and son Jimmy where "the agriculture is more diverse than in KS — orchards, blueberries, corn, and dairy farms. I haven't seen any wheat."

STEVE ELA 1985 Grand Junction, CO
Finishing a masters in Soil Sciences at the University of Minnesota, with a minor in Water Resources. "Moving with Mary back to Colorado. I'll be co-managing our orchard operation with my uncle and cousin, and planting about 4,000 trees in the next few years."

JESS ENNIS 1987 Madison, WI
"Livin' the good life with my fiancee Laura on a 13-acre vegetable and berry farm. Working at the Wisconsin Rural Development Center,

coordinating a LISA-funded economic study with 45 dairy farmers. Although it's awfully tough to fit into one's culture after a year at The Land, I do try to by doing the polka through grocery store aisles."

RAY EPP 1989 Winnipeg, Manitoba
The provincial coordinator of a five-denomination project, the Ecumenical Ministry to Agriculture. Has conducted several workshops, written for "Upshoots" and "The Mennonite" magazines, and formed a Land Study Group. Organized a workshop on Agriculture, Ecology, and Economics for the Mennonite World Conference.

KAREN FINLEY 1988 Corvallis, OR
Studying grassland raptors in the Butte Valley (northern California). Also working to restore two sections of degraded abandoned farmland to native grass. Planning on graduate school in the next year, probably in Wildlife Ecology.

CINDY FOREMAN 1989 Wibaux, MT
With husband Randy just moved to Montana, where she is teaching economics at Dawson Community College while looking for full-time work, to "keep my brain engaged and my foot in at least one door."

CATON GAUTHIER 1988 Annapolis, MD
Working for the Chesapeake Bay Foundation as an Environmental Educator. "I take school groups on the water and in the marshes to learn about ecology, fish and other critters, to develop a sense of spirituality about the environment, to help them understand human impact on the Bay, and to have fun!"

MARK GERNES 1986 White Bear Lake, MN
Mark is working for the MN Pollution Control Agency, teaching a community college class on plants, busy being a new dad. His spouse Carole is busy being a new mom, trying to publish a paper, and teaching a night class at Minneapolis Community College.

BETH GIBANS 1988 Salina, KS
Stayed with The Land Institute after her internship to assist with research and the new interns. Worked with Wes organizing the "Marriage of Ecology and Agriculture" conference. Has been on staff as development assistant since January, helping with fundraising and organizational efforts. "You'll be hearing from me soon."

REVEREND HUGH RUSKIN GOULD 1983 Mt. Shasta, CA
Trainee-Priest at Shasta Abbey, seminary and training monastery for the Buddhist priesthood. Completed term as Head Novice. Currently Assistant Repositorian for Shasta Abbey Buddhist Supplies.

REGINA GRABROVAC 1982 Morrill, ME
Lives and works on a vegetable farm, and is involved in a farmers market. "Working with people on creating the farm I am on into an active farming community land trust; as well as fighting towards the preservation of same farm from a 'divorce/land partition settlement.'"

JEANNE GREEN 1979 Burkburnett, TX
With her son Christopher and her grandmother lives in a small farming community in Texas, "where agribusiness thrives." Teaches reading to children grades 1-6, and does her best to live lightly on the planet.

MARTIN GURSKY 1984 Framingham, MA
Co-director of Natick Community Farm and co-chairperson of Massachusetts NOFA. Writing a manual on community supportable agriculture, and "looking for a simpler life." Donna runs a shelter for homeless single adults, and their son Marcus wants to go to Indonesia.

ALISSA GUYER 1979 Honolulu, HI
Has been traveling throughout the Middle East with her fiance Neal, a director for Save the Children. "Lots of very interesting agriculture throughout this region!"

ALI HENDERSON (CASSIDY) 1979 Alexandria, VA
Working in Washington as a video writer/producer for the past 6 years, and is currently VP of a small firm that is owned by two very good

friends. Married three years, expecting their first baby in September.

ERIC HERMINGHAUSEN 1976 Newark, VT
A maintenance person/carpenter for the Wildflower Inn. "Mary, my partner, and I recently became caretakers of a small piece of the Vermont woods and have begun to build a house there."

DEBRA ISRAEL 1983 Cochabamba, Bolivia
Completed an MS in Agricultural Economics last fall and then worked for a few months as a Research Associate doing economic analysis for a LISA project. Now living in Bolivia.

BERNI JILKA 1989 Salina, KS
Currently intern coordinator at The Land, working on research and planting trees. Member of the board of directors of the Kansas Organic Producers, and on the steering committee of Citizens for a Healthy Environment.

RANDY KEMPA 1987 Gays Mill, WI
"I just got back from planting trees in India. Now I'm looking for a farm to plant monocultures on."

BRUCE KENDALL 1987 Tucson, AZ
Graduate student in ecology and evolutionary biology at the University of Arizona. "I'm still poking my nose into a lot of things, but what I hope to settle into is some sort of study of ecosystem-level dynamics. I'm doing a fair amount of hiking in the mountains, and spending more time with nature photography."

KELLY KINDSCHER 1979 Lawrence, KS
Spring 1989 Master's Degree in Systematics and Ecology. An edited version of his thesis, 'Medicinal Prairie Plants' will be published in 1991. Currently working on a Ph.D., conducting wetland research for the EPA, working with the Kansas Ecological Reserve at KU, and has established an environmental consulting business.

JULIE KOIS 1985 Northampton, MA
Works part time as a copy editor for a zoology journal and part time as a clerical worker at the University of Mass., Amherst. Does voluntary tutoring in literacy programs. Frequently gets together with Carol LaLiberte, also an '85 intern living near Boston.

KERRY KRAMER 1977 Pueblo, CO
"After twenty years of historical/anthropological work and political/environmental activity, I dropped everything and took this last year off. I've been writing grants and doing yoga for a year. Everyone should have a year off!" Married, with two daughters.

JOHN RICHARDS-LAATSCH 1985 Huntington, IN
Manages a 160-acre farm and four-acre organic market garden. Most veggies are sold locally, and they hope to expand to out of state wholesale this year. Organized Huntington's first Recycling Day in '89, which has developed into a permanent curbside program. He and his wife Lynda have two sons and are expecting a third child in November.

COLIN LAIRD 1989 Snowmass, CO
Intern at The Rocky Mountain Institute, "updating a catalogue of water-efficient technologies, adding the right objectivity to farm policy papers, hauling manure, wondering when the bananas in the greenhouse will be ripe, in search of bear, mountain lion, wilderness."

CAROL LALIBERTE 1985 Weston, MA
Co-manages a market garden outside of Boston. "It is a lively farm, still keeping me fully engaged. I still learn tunes on my penny whistle, making music whenever I can."

CURT LAUB 1982 Blacksburg, VA
"I am still chipping away at Virginia Tech. May actually receive a M.S. A tremendous experience, much like my short time at The Land." Just married to Kathy Warwick. "What a way to start the new decade!"

JOHN LAWSON 1976 Columbus, OH
A Technical Sales Representative. "House like all the rest on the block, organic garden in backyard, vitamins in kitchen, 'Where The Waste-land Ends' on the bookshelf, exercising regularly and hair turning gray rapidly! It's a great world!"

ROGER LBOVITZ 1987 Burlington, VT
"I'm still baking bread, but after two years of rolling in the dough I think I'm ready for a change." Planning to apply to the Environmental Law Center at the Vermont Law School. "I've picked up the thought that it would be better if people were able to make their own basic foodstuffs, but this attitude certainly gets in the way of making a living making food."

SUE LEIKAM-BURGHART 1976 Scottsdale, AZ
"An original weenie-arm! Two children; owner, "Succinct Ink," a graphic design and writing firm; engaged to marry Russell Moore on Nov. 24, and very, very happy!!"

CAROL MAGUIRE 1978 Dallas, TX
Currently in Minneapolis traveling with "Fiddler on the Roof" as Assistant Electrician and 1st Follow Spot. "Trying to save enough money to buy a small bit of land to finally fulfill that dream, pending on surviving this road life."

KYLE MANSFIELD 1976 Minneapolis, MN
A lawyer in partnership with a friend. "Our firm's building was built in 1885. Business is good!" Married to Lauren; two children and expecting another in September.

TONY MARTIN 1984 Big Island, VA
"We live on 20 acres at the foot of the Blue Ridge — where we are building a house, planting trees, gardening, growing mushrooms, raising dairy goats and children (two of them)." Tony teaches Adult Basic Education part-time. Patsy teaches gifted kids.

BARRY MOIR 1982 Magnolia, MA
Lives on the rocky coast of Massachusetts with his wife Laila and their baby in the house of his grandfather. Barry is a farm manager on a turkey farm. "We raise turkeys on the range as naturally as possible, and help promote recycling and global responsibility."

TOM MULCRONE 1980 Chicago, IL
Has been working with energy consulting firms. His Global Energy Inc. does bread and butter energy conservation for home and light commercial clients — "Big business in a small way."

CARY NAILLING 1983 Chapel Hill, NC
"In 1985, I bought 30 acres of land near Pittsboro, NC. In 1986, I married Chester Copeland. I've been working as a med. tech. in cytogenetics to pay for the land... We grow our crops naturally."

PAMELA NELSON 1979 Galena, AK
Spent six years with spouse Mike Spindler teaching in Alaska, traveling to camps to teach isolated children during the last three. "I've been running dogs for four years, and have spent my time fishing, training dogs, learning to navigate and survive in arctic conditions."

ED NEWMAN 1980 Athens, OH
Involved in recycling, enforcement, education, clean-up, and community organizing. Publishes The Sort Report, to promote sound solid waste management practices, moving toward sustainable economic development and planning. Plays hammered dulcimer with the Deadbeat Dance Band.

ED ORRIS 1989 West Mifflin, PA
Will be going to graduate school this fall for a Master's in Sustainable Systems at Slippery Rock University, Pennsylvania.

KARL PARKER 1979 Galway, NY
M.S. in Environmental Science and Forestry, 1985. Now a wildlife biologist with the N.Y.S. Dept. of Environmental Conservation. With

his wife Elizabeth and two children lives "in the boondocks in the Adirondack foothills but we gain our livelihood in more urbanized areas. I'm a member of my town planning board."

DEB PARKS & MIKE CHAPMAN 1980 Sioux Falls, SD
Deb does EKG Tech at a large hospital for a living, rides horseback, and teaches kids and adults. Mike is a Research Associate at Augustana College. "We look at prairie soils to determine if organic matter shows grassland persistence or change in vegetation over hundreds of years."

MARVIN PAULS 1982 Missoula, MT
"I finally received my BFA. I have had sculptures in shows every year since 1985. One of my works was selected for a traveling exhibition, and I even sold a piece last year. I'll be going back to school in the fall to get my teaching certification."

MARTY PETERS 1977 Tokyo, Japan
Has been living in Japan with his wife Kyoko, using environmental issues to teach English. Last year Land Institute interns made him a cassette to help out

MARI PETERSON (DETRIXHE) 1979 Clyde, KS
Lives with husband Ed on a farm 50 miles north of Salina, raising wheat and native grasses and caring for an orchard, a vineyard, vegetable and herb gardens, berry bushes, and nut trees. Also teaches economics at the community college, serves as chair of The Land Institute Board, and is a founding member of the local League of Women Voters.

ROB PETERSON & PERRI BUTLER 1986/87 Berkeley Springs, WV
Rob and Perri work at an organic farm just off I-70 two hours from D.C. "We market vegetables, baked goods, and a few other things. Rob is still getting used to being in the U.S. after two years as Rodale Institute's West Africa Representative/Ag Information Officer in Senegal." Perri did a garden internship at the Univ. of Calif., Santa Cruz.

CICI PFINGSTON & MARK BIGELOW 1981 Littleton, CO
Cici: "Using my M.A. in Psychology at home raising two daughters and volunteering as a La Leche League leader." Mark: "I graduated from Union Theological Seminary with a master's degree in divinity in 1986. Since then I have been the Associate Minister for Education at First Plymouth Congregational Church, Englewood, CO."

DANA PRICE 1984 Thailand
Has been working on community development and sustainable agriculture in Thailand, teaching IPM, legume rotations, and botanical pesticide use. "Poor land, too many people — yet, somehow, a way of life that has beauty and dignity."

MARIE RASCH 1981 Conklin, MI
Started her own consulting firm called IFM - Integrated Farm Management - to integrate ecology on the farm. "My interests are in the non-toxic biological approach as the means for transition on farms. I am also raising four acres of peaches in a very unconventional way."

PAUL RASCH 1980 Fox, AR
Agricultural Coordinator at Meadowcreek, coordinating various farm enterprises and responsible for educational programs related to the farm. "Perfecting a lentil loaf and nutritional yeast gravy dish, and tore down the south side of the classroom and rebuilt it in less than two weeks!" Married to Sara, with one son and new baby daughter.

VERONICA RAY 1987 Des Moines, IA
With Don, a new parent in April. "We're still on the lookout for a place to settle in rural Iowa..."

KIRK RILEY 1984 Fenton, MI
For the past 2 1/2 years worked as an environmental consultant, "taking huge sums of money from school districts to tell them what to do with their asbestos and other hazards. Now I am starting classes at the University of Michigan towards a master's in Natural Resource Policy." Married to Katie, a grad student in physical therapy.

ANNIE & DENNIS RONSSSE 1980 Anchorage, AK
"After eight years in the Alaskan Bush we took a year of leave. We miss much about teaching and living in the Yupik Eskimo villages... We love the beauty and wild spirit of Alaska but Kansas is still in our hearts." Two children.

JAN RYAN 1981 Lansing, MI
"I happily turned in my thesis this spring to finally graduate from a master's program in entomology, at Michigan State. I am presently working as director of the Self-Help Garden Project, a non-profit organization sponsored by the Greater Lansing Food Bank."

MELISSA SARLAT 1986 Greenfield, MA
Clearing land with husband Ted Pool for an organic market garden. "This year I have 1/4 acre and have been going to the Amherst farmers market. We are also building a house - with help, of course."

MARK SLATER 1986 Alcalde, NM
Beginning a permaculture project at a home for abused and neglected teenage boys. "The 100 acres needs as much healing and attention as the boys do. Special Accomplishments: Staying sane after the first three months of my new job." Recently married to Dyan del Gaudio.

STUART SLOTE 1982 Montpelier, VT
Working as an Energy Engineer since Sept. 1988 for the State Dept. of Public Service, Conservation and Renewable Energy Unit. "I'm starting a Master's in Natural Resources Planning, participating in Habitat for Humanity, and co-teach a course on eco-technology at The Institute for Social Ecology."

LYNN SONTAG 1981 Jamestown, OH
"Didn't send the last one because I found it floating in the dishwasher... a bit telling about the grand things I'm doing!) I am the mother of a one and a half year old son and caretaker of a small organic orchard and large garden."

MEL STAMPE 1977 Cincinnati, OH
Celebrated 10th wedding anniversary with Pam in March. Mel is working at the University of Cincinnati computing center and Pam is a psychological nurse. Before working at U.C., Mel managed a food coop for 4 1/2 years. They have two daughters.

VERN STIEFEL 1985 Manhattan, KS
"I'm immersed in grad school at KSU in the Dept. of Entomology. My master's thesis will be on the relationship between drought tolerance and spider mite tolerance in grain sorghum." Married to Elisa, with a five-year-old daughter and a new baby daughter.

JEAN STRAMEL 1981 Quinter, KS
Working on a master's degree in biology at Fort Hays State University. Thesis project is a floristic study of Scott State Park in Kansas. Married to David Ebbert. "In recent years I have done farm work and taught science. We are buying an 8-acre farmstead... wide open, good clean water, no oil wells in sight." Recently parents, of Silas.

DOUG TOWNE 1988 Phoenix, AZ
Currently employed by the AZ Dept. of Water Resources. "After learning of some of their 'research' programs, I've been writing on some of the most reprehensible studies for outside publications such as *High Country News*. Spend most of my free time in the Sonoran Desert."

JAKE VAIL 1988 Salina, KS
Research and Education Assistant at The Land Institute, where he alternates between working on a USDA LISA experiment and helping with *The Land Report*. Active in a new farming cooperative, and wishing always for more time to explore and enjoy the prairie.

FRED VOGLER 1981 Los Angeles, CA
Spent two summers in Glacier Bay, AK, working in the national park. "Since 1986 I have been in Los Angeles pursuing an acting career. A fairly unpleasant, unhealthy place to live, but I've managed to become comfortable amid the smog alerts, freeway shootings, earth-

quakes, and various crazies."

WENDELL WIEBE-POWELL 1979 Lawrence, KS
Wendell and his wife Laura Powell are two-thirds of the way through a master's program at a United Methodist seminary in Kansas City, MO, which emphasizes liberation theology. "We plan to continue developing our work helping people integrate environmental and social issues with their faith and action." They have one son, Jordan.

MAUREEN WILLIAMS 1978 Onancock, VA
Lives in a small town on the Chesapeake Bay with her husband Brian and their five kids, and is very much active in the community, especially local recycling efforts.

WILLOW 1983 Salina, KS
"Full-time mothering 2-1/2 year old twins, Joshua Sky and Kevin River." Married to Phil Weaver.

HOLLY WINGER 1985 Combs, AR
Gardening and farming at Parsley Hollow Farm with her husband Steve Diver and son Luke. "We are caretaking a beautiful turn-of-the-century farm. Continuing to do free-lance writing/editing, research, and other work in farming, energy, and self/earth healing."

KARL ZIMMERER 1979 Madison, WI
Leaving the University of North Carolina for a new faculty position at the University of Wisconsin. "We change accents on August 1. I look forward to being in the trenches (furrows?) with aggies."

ANN ZIMMERMAN 1984 Wichita, KS
Has been working as a legal aid lawyer in Wichita for two years. "In off hours I go to board meetings of the Kansas Natural Resource Council and do singing gigs around the state. Best annual gig: Prairie Festival, of course."

A Diversity of Donors

Tom Mulhern

"How is this place funded?" is one of the questions most frequently asked by visitors to The Land Institute. Many are surprised to learn that private charitable contributions make up most of our half-million dollar annual budget. During the past year, The Land Institute received grants and donations from fifteen foundations, five corporations, and more than 1,200 individual supporters in 48 states and 6 foreign countries. The only government support was a subgrant from a USDA LISA (Low Input Sustainable Agriculture) Program grant to Kansas State University, representing just two percent of our total budget.

Two-thirds of the budget has historically come from private foundations, and we're about to add a new and well-known name to our list of foundation funders. The Pew Charitable Trusts in Philadelphia recently approved a three-year, \$120,000 grant to support our intern program. This is the first time that The Land Institute has received funding from The Pew Charitable Trusts, one of the five largest foundations in the United States.

Two of the most generous and consistent sources of funding for The Land Institute during the past decade have been The Joyce Foundation in Chicago and The Jessie Smith Noyes Foundation in New York. As this was written, we received word that The Joyce Foundation approved a new two-year grant, and we have a request for a renewal grant pending with the Jessie Smith Noyes Foundation. While directly supporting our work, they and several other of our foundation friends have encouraged our efforts to develop a broader base of support in some very practical ways. For example, last year The Educational Foundation of America gave a special \$25,000 grant to help us plan a strategy for building greater long-term financial security. Now that we've

developed such a strategy, they're planning to give us an additional \$90,000 to help carry it out. Also, The Charles Stewart Mott Foundation is challenging us to raise \$25,000 during the coming year, by offering to match new and increased contributions dollar for dollar up to that amount.

Just as the diversity of plant species is a source of strength and resilience in the native prairie, diversity of funding sources is the key to a strong and resilient organization. The Land Institute is moving toward greater diversity, as demonstrated not only by new foundation grants but also by the fact that the number of individual donors and the amount they contributed increased by more than one-third in the past year.

It takes contributions of all sizes to raise the budget, and every donor is important to the cause — the \$15, \$25, \$50 and \$100 donations add up to significant amounts, and give powerful evidence that there is a broad base of support for this work. We hope to continue to build that diversity by attracting the attention, interest and support of the growing numbers of people who recognize the critical importance of sustainable agriculture and good stewardship of the earth.

If you have provided for The Land Institute in your estate plans, please tell us about it. If not, let us show you how.

Through a bequest you can:

- Provide for the future of The Land Institute,
- Possibly reduce the tax burden on your estate, and
- Permanently link your name to The Land Institute through the creation of an endowed fund.

For information about establishing a bequest to The Land Institute, please call or write Tom Mulhern, The Land Institute, 2440 E. Water Well Rd., Salina, KS, 67401. (913) 823-5376.



Fall Visitors' Day is October 6

The Land Institute invites you to learn first-hand about our work in sustainable agriculture during our Fall Visitors' Day Open House, Saturday, October 6th from 12:30 to 5:30 p.m. The day will include tours of research plots and gardens and a walk on the prairie. Special programs for children will be held, along with workshops, slide shows, and videos. Refreshments will be served, and admission is free.

Left: Any day is Visitors' Day on the prairie. Holly (at right) explains her studies to Jon, Paul, Berni, Tamara, Kris, Todd, and Kathy.

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Invest in The Land Institute

The work of The Land Institute is based on a vision of a way of agriculture -- and a way of life -- that protects the long-term ability of the earth to support a variety of life and culture. If you share this vision and would like to get more actively involved in making it a reality, please clip and return the form below to The Land Institute.

**YES! I WANT TO JOIN
THE FRIENDS OF THE LAND**

Here's my membership gift for sustainable agriculture and good stewardship of the earth.

___ \$15 ___ \$25 ___ \$50 ___ \$100 ___ \$500

NAME _____

ADDRESS _____

PLEASE SEND ME INFORMATION ABOUT:

- ___ Establishing an endowment fund
- ___ Making a gift of stock
- ___ Receiving income from my gift
- ___ Making a gift through life insurance
- ___ Generating a tax deduction from my personal residence or farm
- ___ Providing for The Land Institute in my will
- ___ Making a gift of art or antiques
- ___ Setting up a memorial fund
- ___ Joining the Friends of The Land