

LAND REPORT

THE LAND INSTITUTE • FALL 2010



THE LAND INSTITUTE

MISSION STATEMENT

When people, land and community are as one, all three members prosper; when they relate not as members but as competing interests, all three are exploited. By consulting nature as the source and measure of that membership, The Land Institute seeks to develop an agriculture that will save soil from being lost or poisoned, while promoting a community life at once prosperous and enduring.

OUR WORK

Thousands of new perennial grain plants live year-round at The Land Institute, prototypes we developed in pursuit of a new agriculture that mimics natural ecosystems. Grown in polycultures, perennial crops require less fertilizer, herbicide and pesticide. Their root systems are massive. They manage water better, exchange nutrients more efficiently and hold soil against the erosion of water and wind. This strengthens the plants' resilience to weather extremes, and restores the soil's capacity to hold carbon. Our aim is to make conservation a consequence, not a casualty, of agricultural production.

LAND REPORT

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ELECTRONIC MEDIA

To receive Scoop, e-mail news about The Land Institute, write to Joan Jackson at olsen@landinstitute.org, or call. Our Web site is landinstitute.org.

SUPPORT

To help The Land Institute, see the contribution form on the back cover, or contribute online at landinstitute.org. Funders receive the Land Report.

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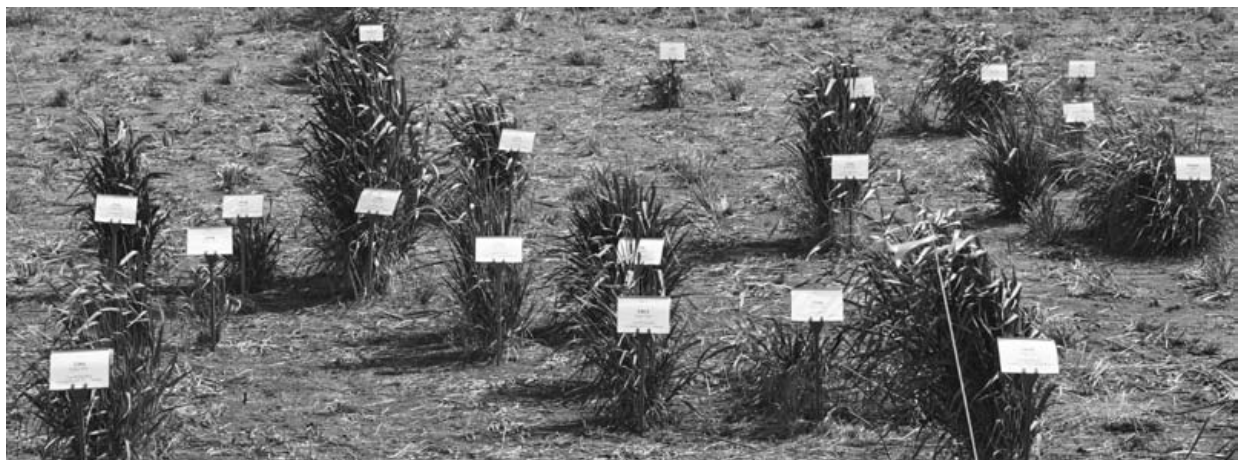
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Perennial wheat seed from The Land Institute was planted three years ago in Australia and continues to regrow, passing a test for breeding to begin there. See page 6. Lee DeHaan photo. Cover: Measurement of intermediate wheatgrass, part of breeding the perennial for grain production. The University of Minnesota is taking the first steps toward what could become a parallel breeding program. See page 7. Scott Bontz photo.



At right is a Maximilian sunflower unlike any that you will see in the wild. This is one of several plants in The Land Institute's 2010 breeding nurseries with impressively large heads and reduced branching. These plants are beginning to resemble the domesticated annual oilseed sunflower more than the wild populations that were their ancestors – see plant on left. In other ways – their ability to survive the winter and



regrow early in the spring, for example – they are very different from annual sunflowers. Their appearance after only 10 years of breeding shows that plant form can change quickly. No inter-species hybridization or transgenic approaches were used, only classic genetics and elbow grease. These results give us hope that this and other perennial species can be domesticated in our lifetimes. Scott Bontz photo.

FASTER TRACK TO PERENNIAL WHEAT

Half a century ago, breeders failed to achieve perennial wheat because, Land Institute scientist Lee DeHaan said, “They were working blind.” The breeders could see only how their individual hybrid plants performed. They couldn’t see inside to sort out how chromosomes of distantly related parent species had been combined or lost. Each plant might essentially be a new species. Each new round of breeding was another shot in the dark.

In the past 10 years technology has become quick and cheap enough for seeing these genetic fingerprints. Now a scientist can quickly identify first-round breeding successes, vastly speeding progress toward a workable crop plant.

This takes not only equipment, but expertise. Though DeHaan had worked with technique beyond that of his predecessors, to cross wheat by wild relatives, he still couldn’t read the genome. So in September The Land Institute hired Shuwen Wang for breeding perennial wheat. This freed DeHaan to concentrate on the task that had split his time, domestication of the perennial intermediate wheatgrass. Each plant will enjoy a PhD scientist’s full attention.

Wang will treat DNA samples with polymerase, an enzyme that makes millions of synthetic replicas of DNA fragments con-

stituting genetic code. Those replicas become a marker, large enough to photograph. Sequences of replicated fragments go on a porous gel. Electricity pulls fragments into the pores. A larger fragment, which might be in or next to the genetic code for a trait such as perenniality, doesn’t travel as deeply into the gel. So the sequence image shows a pattern of markers in different rows. By associating such signatures from thousands of plants with observation of how the plants grew, Wang will be able to tell which of the marker combinations tend to be associated with the perennial trait. He doesn’t know yet how many genes are involved, but from past research can tell that the combination is complex. To identify all of the markers for perenniality will take considerable effort. But with that guide finally in hand, the ability of The Land Institute to sort hybrid wheat plants will leap in precision and speed.

After mapping for perenniality, Wang could seek molecular markers for other important traits, including seed size and yield.

Wang grew up on a small farm – less than an acre – near Shanghai. His parents still raise rice and wheat. At school, Wang said, “I thought I could do more things for farmers if I chose agronomy.” With a bachelor’s degree from a Chinese university, he began breeding wheat in 1988. A visiting

professor from Oklahoma State lured him to obtain his doctorate. Wang went on to work at South Dakota State, where he also bred soybeans. He brings to Salina his wife and teen-age daughter.

IN CANADA

A new Canadian program joins the increasingly international exploration – along with Chinese and Australians – of perennial grains. The University of Manitoba allocated \$300,000 for five years of breeding. The provincial government matched this, and a grant allots another \$200,000. More funding irons are in the fire, said Scott Stothers, one of the organizers, whose job is looking at agriculture's long-term challenges.

The Land Institute had supported a graduate fellow at Manitoba, to study polycultures. Institute scientists explained their work to the school in 2005. Teachers from the university repeatedly come south to learn more. And institute plant breeder Lee DeHaan shared seed. Stothers, an economist and former banker, took the idea of developing perennial grains to farmers who had been his clients. The response: "Do it now." He said, "Not one of them said it was a crazy idea – at least not to my face."

Heading the Manitoba job will be Doug Cattani, who has worked almost 30 years with perennials as a turf and forage breeder. The effort will start small, with perhaps a couple of graduate students and an assistant. Among plants Cattani has to evaluate for development are perennial sunflower, hybrid perennial cereal rye now used as a forage crop, and hybrid wheat. He'll also look at native perennial species used by Indians, including prairie turnip, a legume with edible roots and large seed.

Among the challenges are why hybrid wheat only survives for two winters in Manitoba, and the perennial cereal rye's

disease problems, as well as reversion to parental species of annual rye and a perennial forage grass.

The Manitoba program also aims to develop perennial and annual legumes as companion crops to the perennial grains.

IN AUSTRALIA

A handful of perennial wheat hybrid breeding lines survived three years in Australia's poor soil, impressing international scientists who met there in September. The plants grew only for a feasibility study. Breeding for improvement will require Australian researchers to corral greater financial backing.

The survivors were among many plants tested using seed from The Land Institute and Washington State University. Land Institute breeder Lee DeHaan's wheat hybrids have overwintered in Kansas, but until this year had failed during summer: fertile plants died, survivors were sterile. Australia also has harsh heat, plus ancient, poor soil. But, possibly because that soil is sandier and drier than the clayey ground in Kansas, several wheat lines survived. The success impressed everyone, DeHaan said, including two former skeptics leading the Australian program.

DeHaan and Land Institute sunflower breeder David Van Tassel were among 30 scientists, including one from Washington State and two from China, at Wagga Wagga, New South Wales, for the second international conference on developing perennial grain crops.

IN CHINA

Chinese scientists mapped the DNA sequence of *Oryza longistaminata*, the perennial parent species for their ongoing development of perennial rice to cut erosion. The map might help with getting two major rhizome genes into annual crop rice.

This will allow breeders to observe effects of the genes in isolation from all the other *O. longistaminata* genes. Rhizomes are underground stems found in many desirable perennials.

Land Institute scientist Stan Cox visited the Yunnan Academy of Agricultural Sciences in October. He and other Land Institute breeders first saw the Chinese work two years earlier. This year the leader of the perennial rice program, Hu Fengyi, showed expanded plots of rice with strong rhizome development combined with seed fertility rated fair to good. He had also crossed such plants with annual rice to improve their crop value. As expected, only a handful of the 1,000 backcrosses showed rhizomes, and only one of those had good seed fertility. Hu will grow much larger populations in search of more such plants.

IN MINNESOTA

Lee DeHaan, for seven years working to develop what might become the first widely grown perennial grain crop, will push for complementary research at the University of Minnesota. The school's College of Food, Agriculture, and Natural Resource Sciences has named DeHaan to its Endowed Chair in Agricultural Systems. In the eight-week position he hopes to speed development of perennial intermediate wheatgrass as a grain.

Now the plant is used only for forage. Based on his progress, DeHaan thinks it could be profitable for grain in 10 more years. But, as he wrote in his proposal to the school, "For this dream to become reality, I need to begin research collaborations across the fields of genetics, agronomy, soil science, plant pathology, food science, and economics." He said agricultural research and production are heavily influenced by market forces and social pressures. "If a new peren-

nial grain crop is going to succeed, a team of diverse experts will need to help bring it about."

DeHaan will not oversee the start of a breeding program. His goal is to enlist and start collaborators who will go on to do so. Many past, one-time visits with other potential collaborators have been good talk, DeHaan said, "But little has come of it." Now he'll be able to work face to face and in the field, repeatedly. "My experience in writing papers, giving talks, providing field tours," he said, "has shown that there is no substitute for seeing, tasting, and touching." In October he planted research plots at the university in St. Paul and at Roseau, in the heart of Minnesota's existing perennial grass seed industry – and with access to its expertise. He'll also plant wheatgrass on a pair of farms for demonstration to grain growers. (In addition to working wheatgrass plots at The Land Institute, DeHaan has enlisted a total of 30 acres on two farms in central Kansas.) For six weeks next summer he'll concentrate on forging connections with students and professors in diverse fields, and with interested farmers and organizations outside the school.

Wheatgrass is a cool-season grass, and DeHaan thinks it might be more easily adopted in Minnesota, a leading producer of perennial cool-season grass seed.

PRESENTATIONS

Land Institute staff members spoke in Iowa, Texas, Washington, DC, New York, Colorado and Montana. Upcoming: November 15, Galveston, Texas. November 17, Ames, Iowa. November 29-30, Seattle. December 4, Carrollton, Kentucky. January 27, Columbia, Missouri. February 4, Pennsylvania – exact location to come. March 13-15, Hanover, Indiana. For more, call us or see Calendar at landinstitute.org.

NEW SCIENCE BUILDING OPENS

SCOTT BONTZ

No more fear of a twister stealing seeds loaded with a decade of progress toward perennial grains – seeds that will someday mean less fear of storms taking soil. No more harvests piled in a greenhouse, at risk to mold and mice, and consuming space meant for nurturing through winter an ex-

tra generation in breeding. In September, after 12 months of construction, The Land Institute's scientists and technicians moved into a \$2 million research building.

Finish work remained. But plants hauled from the field were drying in a dedicated room of the 13,000-square-foot structure. Below, under concrete and behind steel



The Land Institute's research building nestles to the right of the greenhouse and office. Dennis Dimick photo.

doors, waited a 1,000-square-foot vault for select seed. Under the same roof as these spaces, offices of the plants' breeders ring a common room under a clerestory awash with natural light.

"I really didn't believe it would happen. I didn't think everything would come together," sunflower breeder David Van Tassel said of a project years in the planning. But the institute scientists' functional standards were satisfied, the funding was found, and Van Tassel was thrilled.

"I think we ended up with an exceptionally good building," said Salina architect Warren Ediger, whose job was to take the kind of pre-engineered metal building historically used for storing farm equip-

ment and tailor it to the breeders' exacting scientific need, as well as make it energy-tight.

The research building unifies and streamlines the parts of plant breeding that must be done away from the field. For example, of one important step Van Tassel said, "It will greatly improve our ability to unload and dry samples, which is a huge relief." Carts on a trailer will take harvested plants from the field to the building and be wheeled directly to the drying room. From there the carts can roll to an adjacent threshing room with climate and dust control, or to basement storage. This avoids repeated carrying by hand, which is slower and risks spills.





A room designed for the purpose dries plants that were cut and bagged in the field and wheeled in on racks. Here John Mai also uses it to dry root demonstration plants. Scott Bontz photo.

Intermediate wheatgrass scientist Lee DeHaan said that drying and threshing rooms that can be used regardless of wind, precipitation, and temperature extremes would assure getting seed needed to expand and improve breeding, and thus speed getting perennial grains that work.

The structure, 160 by 60 feet, supplants and coordinates several scattered work places: a house-sized building erected in the 1970's as a classroom and since converted to science offices and laboratory, threshing in an open equipment shed, and seed storage in the half-basement of a wood house that serves as The Land Institute office.

Funding for the new building was launched with a \$1.44 million pledge from descendants of Joyce C. Hall, founder of Hallmark Cards, and his wife, Elizabeth. One hundred ninety-five other donors gave the balance.

Architect Ediger, The Land Institute, and the contractor, Reinert Co., pursued the construction economy of a pre-engineered metal building, but with the operating economy of high insulation, tight vapor seals, earth shelter on the long, north side, double-paned windows, roof overhangs for shade, natural and mechanical ventilation, geothermal heating and air conditioning, on-demand water heating, and division of the building by function and environment requirements – offices at one end, threshing room at the other, lab and other work areas between. They also sought local construction materials, especially those with high transportation energy costs. Ediger said the result – leaving posts, beams, ducts, and conduit exposed, with an appearance of utility – is better insulated and sealed than most offices of similar construction. “The Land has what should be an exceedingly good pre-engineered metal building,” he said.

Ray Dean, a University of Kansas engineer and longtime Land Institute adviser, visited with hundreds of others at the Prairie Festival on September 25 and praised the place as “just right.” The building is not atop a hill, it's away from the road, its roof slopes gently, its color matches the neighboring trees and grass. Dean lauded the simple clerestory light, and the air system, easily and manually controlled. He expected heat transfer wells around the building would work to efficiently balance the temperature between it and the earth over summer and winter.

For an architect, it's usual that a client organization provide as liaison those employees who work in the specialties that the building must address. In this case, there was the drying room. Agricultural researchers usually dry plants with heat. But high heat can affect seed, and heating uses lots of energy. Ediger's mechanical engineer suggested instead using a dehydration system. The plant breeders' inexperience with this made them wary. But they were swung by the manufacturer's explanation of the physics, and presentation of past performances.

The building's lab area is several times larger than the old lab, where two was a crowd. The new lab has a couple of side rooms. One will be dedicated for wheat breeder Shuwen Wang to study DNA samples. The other side room will take a venting, hooded bench for sterile processing of embryonic hybrid seeds.

The drying room and the seed vault are the two parts of the structure built for a capacity beyond current need. But without them, Van Tassel said, “We really were up against it.” Now – limited by weed control – he figures the field use for experimental and breeding plots could double or triple. “We're still fairly modest, but the trajectory is right.”



“Hay Meadow,” etching and drypoint, by Arthur W. Hall. Courtesy of the Spencer Museum of Art, University of Kansas.



THE GENIUS OF THE GRASS

A Former Farmgirl Goes
to the Prairie Festival

JULENE BAIR

When I say that I come from western Kansas, where my father grew wheat and raised sheep, people often tell me how bored they were on their last drive across the Plains. I agree. The Plains are boring now that the land has been plowed into an almost solid patchwork of corn, soybeans, and wheat. But when I was a child, there were still many pastures where buffalograss knit itself over the ground like a woolly tapestry. I could imagine the days when the pale grass rolled toward the horizon, infinite green meeting infinite blue.

Even then I knew that it had been a crime to erase so much beauty. Today I know that the loss went beyond beauty. The grass had sustained millions of bison through dry summers and harsh winters, and might have fed America for generations, had the herds been shepherded instead of obliterated. Buffalograss's miraculous drought and cold tolerance stemmed from below ground, where a square yard of sod could contain up to five miles of roots. It sequestered much more carbon than do the shallow-rooted, short-lived annual crops we replaced it with. It also supported a diverse biotic community and prevented the soil

from abandoning itself to erosion.

That was the genius of buffalograss, part of “the genius of the place,” a phrase in the title of a new book by Wes Jackson. I know too well the market forces that laid waste to that genius, because my own family’s farm fell prey to them. We plowed grass and sprayed chemicals and pumped water until there was so little to love about our farm that we thought we could easily part with it, banking the profits. But a hundred years of working the land do not drain as easily from the veins of a human as the water and fertility did from our soil. That’s why each fall finds me driving to The Land Institute’s Prairie Festival.

When I go there, I enter a Kansas that has not been destroyed. Where Institute land is plowed, it is for breeding perennial grain crops that combine the seed-producing bounty of annual crops with the soil-preserving genius of perennial grasses and forbs.

...

This year, the open-air barn overflowed with upwards of 1,000 people. They had come to hear a formidable lineup of speakers, among them the worlds’ best-known agricultural writer.

Wendell Berry read from his foreword to the newly released “Kentucky’s Natural Heritage: An Illustrated Guide to Biodiversity,” recounting the desecration of the state’s topsoil, culminating in the coal industry’s removal of entire mountaintops. Enabling the destruction has been a paucity of localized thinking, evident in everything from the “unsettled” nature of those who “came purportedly to settle” to a “displacing religion” that, despite the settlers’ eagerness to own land, “... made a pride of despising the earth and earthly life.”

The industrialization of agriculture that followed on World War II was a par-

ticularly ironic tragedy, said Berry, because by then we did have access to ecological standards advocated by the likes of Aldo Leopold, Albert Howard, and J. Russell Smith. But their work was ignored. Instead, “the machines and chemicals developed to defeat foreign enemies were turned against the farmland and the farmers on the home front.”

Berry illustrated modern agriculture’s myopic focus on the bottom line with a story about the “tumble bugs” that had rolled dung around the cow pastures of his childhood. He suspected that a new worming medicine used in cattle caused their disappearance, but when he asked a university entomologist what had happened to the dung beetles, he was told not to worry, they had no economic significance. Then a plague of face flies hatched in the now unburied dung and caused an expensive pinkeye epidemic in cattle. Could the two events have been related, Berry wondered? Conventional science, economics, and agriculture seldom ask such questions.

He traced a host of agricultural harms to the demise of the small family farm. With fewer people working the land, harm is seldom noticed, let alone prevented. “The cruelest proclamation ever made to American citizens,” said Berry, came in 1952 from the Eisenhower administration: “Get big or get out.”

...

My father got big buying the land of neighbors who couldn’t get big, so had to get out. Part of what allowed him to farm so much land was the dawning of the Age of Dow. If I had shared Berry’s premise, that industrial agriculture fails to look beyond the here and now, he would have said, “Go ahead. Call me myopic.” He had the confidence of a man who’d seen wheat yields triple since his childhood.

But have these increases in production been worth the cost? Hardly, said biologist Sandra Steingraber, whose books tally the health effects of synthetic chemicals while narrating her own battle with bladder cancer and her struggle to raise healthy children in a poisoned world. She pictures the environmental crisis as a tree with two trunks. Along the first, “contamination of all life with toxic chemicals” branch, are strung the health disorders associated with chemicals. Take those attributed to Atrazine, for instance, a weed killer that my father used on corn. Even though it has been banned in Europe for its implications in breast cancer, prostate cancer, and low sperm counts, it is still the second most widely used agricultural chemical in the United States.

Steingraber travels to small farm communities with the recently released documentary film version of her first book, “Living Downstream,” and speaks “... across the great cultural divide on abortion, about chemicals that have the power to trespass into the human uterus and sabotage pregnancies and contribute to miscarriage.” Fortright about her own reproductive history, including the termination of pregnancy that an early ultrasound revealed was “not going to end happily,” she encourages her audiences to transcend differences concerning the abortion debate and to support ending the nation’s dependency on agricultural pesticides.

The other branch of the tree is climate change, or, as Bill McKibben calls it, “the de-creation of life.” “Both halves,” said Steingraber, “rob us as parents of the ability to carry out our two most sacred duties – to keep our children safe from harm and to provide for their future.”

...

Oh yeah. The future. That’s one concept that traditional economists do not factor very

well into their theories, said the ecological economist Joshua Farley. The so-called magic of the market, he said, is really the magic of a barrel of oil, which yields the equivalent of 20,000 hours of human labor. This makes it possible for us to upset ecosystems so fast that they can’t recover. The market has no “feedback loop for when to stop.” Prices often remain stable even as the costs to human health, ecosystems, and future generations mount.

Mainstream theory is based on the notion that the economy should grow ad infinitum, adding 4 to 5 percentage points every year. Never mind if this means a doubling of consumption about every 20 years. If we run out of one resource, we can always substitute another. As an example, Farley offered the theory of the 2005 Nobel economist Thomas C. Schelling, who said climate change was not that much of a threat to the economy, because it would mainly impact agriculture and forestry, which only represents 3 percent of our gross domestic product.

“No food?” quipped Farley. “But, hey, we’ll go see more movies or something.”

Ecological economics replaces the paradigm of endless substitution with that of ecology. It challenges the goal of never-ending growth and takes into account the character of resources, some of which we can’t afford to waste. It also takes a more optimistic view of human nature. Capitalist economics considers successful sharing impossible, and it is predicated on greed. “The wickedest men will do the wickedest things for the greatest good of everyone,” explained Farley, in a paraphrase of John Maynard Keynes. But research demonstrates that humans are wired for cooperation. When we share with others we get a euphoric sense of belonging not unlike the pleasure we get while making love. This feeling has its ori-



Dyck Arboretum, Hesston, Kansas, December 2009. Duane Schrag photo.

gins in our hypothalamuses, which bathe our brains in oxytocin.

Whether we humans are fundamentally greedy or altruistic, the transition to a post-carbon economy will require some cooperation. It will be especially important to share information and new technology. Solar technology, for instance, needs to improve quickly if it is to meet demands for it, and this can happen much faster if researchers share innovations with one another. The market system fails when sharing is called for, because of the need to protect profits. As an alternative, Farley suggested a global collective that would help organizations such as The Land Institute develop and share information essential to sustainability. Common resources, such as air, water, and a stable climate belong to everyone, he argued, and should be managed collectively. Industry would be taxed to pollute or use at levels up to but not exceeding ecosystems' ability to absorb or recover. And since we face a crisis easily as dire as World War II, when the highest tax bracket was 96 percent, some rich people might have to pay more taxes.

...

But the wealthiest 1 percent of Americans, who control 24 percent of the nation's wealth, are especially reticent to pay their share of taxes, said Scott Russell Sanders. His talk was an exquisite tour de force against "the tyranny of concentrated capital." Like Farley, he believes that we are unduly impressed by money, which, after all, is just a "human invention." We fail to value the genuine wealth stored in our natural systems, on which the quality of our existence depends. Meanwhile, those vested with the monetary wealth we so admire use it and the power it bestows to continually amass more of each, while laying waste to that genuine treasure.

Sanders reeled off statistics backing his claims. Last year, the 25 top hedge fund managers made \$26 billion, equivalent to the entire incomes of 500,000 households, or 2 million people – this in a country where 44 million live in poverty and 51 million have no health care insurance. Among the 100 world economies with the largest GDP's, more than half are multinational corporations. One of these corporations, ExxonMobil, surpasses in revenue the economies of 180 nations. These mega-corporations are answerable only to shareholders, yet are allowed to spend millions defending their interests at the public's expense. As an example, Sanders cited ExxonMobil, which has lobbied to advocate drilling in the Arctic National Wildlife Refuge, and to oppose higher fuel efficiency standards, the regulation of carbon emissions, and safety regulations such as double-hulled ships, which would help protect oceans from spills like the Exxon disaster in Prince William Sound.

Why, I wondered, hasn't Barack Obama put Sanders to work? He could explain to those duped by Big Money into fearing for their livelihoods that it's not the economy, stupid, it's the stupid economy. If we view ourselves as citizens and not consumers, Sanders insisted that we can make the necessary changes, restoring regulations and taxation in the interest of the public and the planet.

...

To get to that point, however, requires a wider recognition of the crisis. Wes Jackson expressed hope in this regard, noticing that the "formal culture" of science and literature is beginning to give more consistent credence to "nature as measure or as standard." There have been some enlightened moments in US history, such as when Hugh Hammond Bennett led the Soil Conservation Service

with the goal, in Bennett's words, of "imitating nature as much as we could." By the time Bennett retired, said Jackson, the program involved nearly 5 million farms.

But regardless of Bennett's and other past success, the ecological attitude has never prevailed as a "succession in the formal culture." Without such guidance, we continue to lose topsoil and saturate our farms with chemicals. Witness a hillside of corn stubble that Jackson saw recently. The farmer had employed the popular no-till method, killing weeds with chemicals instead of with implements. At the base of the hill was a catchment pond that had filled with mud. No-till preserves soil and soil moisture better than tillage, but rain will still run downhill and carry dirt with it if there isn't year-round vegetation to stop it.

For Jackson, that monoculture of high yield, genetically modified corn and the abused soil it grew in exemplify what he views as the three causes of our failure to honor natural systems in agriculture. First, it is our nature, as "carbon-based organisms," to go after as much energy-rich carbon as we can get. In our eagerness for rich food energy, he said, we are no different from bacteria consuming a Petri dish of sugar. Second is our attitude that "to get a meal," nature must be, in Angus Wright's phrasing, "subdued or ignored." And finally our heritage in Enlightenment science teaches us to "break a problem down." This process has become so reductive that we too often elevate the value of the parts over the whole. We understand molecular biology and can alter corn, making it immune to a poison that we also invented, which kills all vegetation that competes with our end goal. But we fail to notice the destruction to the whole of nature that we cause in the process.

The perennial grain crops being devel-

oped by The Land Institute and others, said Jackson, may finally allow us to begin moving our focus up the hierarchical chart, from the atom to the ecosphere. Many scientific papers are being published on the subject, making it likelier that the concept of "nature as teacher" will become a succession in agricultural science.

The take-home lesson? "Descriptive" ecology, which tells us "how natural ecosystems work," must "fuse" with "prescriptive" agriculture, which tells us what we must do in order to eat. But only, I took it, if we want to continue eating.

...

At the end of the conference, I sat on a bale of straw against a corrugated tin grain bin like the ones of my childhood, except this one had been painted red. The melody of the state song still played in my ears. As always, "Home on the Range" had been serenely rendered that Sunday morning by Ann Zimmerman and her audience, a good number of us teary eyed. Now the wind was playing on my skin as it sung an even more indigenous tune in the elm and ash above the Smoky Hill River.

What was that line in the last verse? "Where the air is so pure, the zephyrs so free." Ah yes, zephyrs. Ah yes, this dependable sun. This pale-blue translucent sky. And this grass, for at my feet, among the varieties more common to central Kansas, were patches of buffalograss. I ran my hand through the curly, narrow blades.

It was probably just oxytocin, the love hormone, but I hadn't felt so right anywhere in a long time. Why "just," I wondered? What if I listened to what my body and the grass were trying to tell me?

Bending closer to the earth, this is what I heard. "I've been true to you. Be true to me."

PRAIRIE FESTIVAL RECORDINGS

September 24-26, 2010, The Land Institute

QUANTITY	TITLE	SPEAKER
_____	Donnelley lecture on restoration and conservation	Wendell Berry
_____	Restorative economics for a post-carbon planet	Joshua Farley
_____	The farm inside the body: agriculture and child development	Sandra Steingraber
_____	What is wealth?	Scott Russell Sanders
_____	What has been a series is now becoming a succession	Wes Jackson

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To live within limits, to want one thing, or a very few things, very much and love them dearly, cling to them, survey them from every angle, become one with them – that is what makes the poet, the artist, the human being. – Johann Goethe





ON THE STREET BY THE BARN

SCOTT BONTZ

Some 1,000 people at The Land Institute's Prairie Festival on September 24-26, a record, came for the words of Wendell Berry, Sandra Steingraber, and other writers and thinkers who took the stage and mike in our barn-cum-meeting hall. I asked several of the *listeners* to talk, to give *their* take on the state of the nation and world. The simple springboard question: Are you optimistic or pessimistic? The simple score was 4-2 for the dark view. But the answers were more complex, and never hopeless.

A TEACHER

Howard Stoner, 66, about to retire from teaching math at Hudson Valley Community College in Troy, New York, has attended Prairie Festivals for nearly 15 years. He loves the barn dance. And he appreciates the connection with a collection of thinkers. He said, "To be able to come here and sit down and have a conversation with Michael Pollan, or Wendell Berry, or James Howard Kunstler – wow."

Stoner's visit to a sister in Indiana this summer included seeing a wetlands area called Limberlost Swamp. Later he read of

Pen and ink wash over pencil, by Nicholas Rich.

the place in “A Conservationist Manifesto,” by one of this year’s festival speakers, Scott Russell Sanders. Stoner also had wanted to see Indiana’s Donaldson Forest, to pursue his interest in measuring and documenting old-growth trees. That place too came up in Sanders’ writing. “What a coincidence,” Stoner said. “What a juxtaposition.”

Stoner, the most upbeat personality of people I talked with, said he was pessimistic about the world’s apparent path, “But you can’t wallow in that.”

Stoner criticized the United States’ path in Afghanistan. He said killing insurgents is fuel for opposition to the American mission. He held up for example instead the work of Greg Mortenson, who has built more than 50 schools in rural Pakistan and Afghanistan to promote peace through education and literacy. Mortenson’s “Three Cups of Tea” and “Stones into Schools” tell that story.

Another discouragement: ignorance of petroleum supplies bound to fail demand, and lack of preparation for the consequences. Financial advisers to Stoner dismissed the doomsaying: “The stock market has always gone up.” Stoner said, “I’m so convinced that just like it went up, it’s got to come down.”

For his part, Stoner takes interest in what goes into making what he eats. Also, he and his wife hired an energy audit of their 60-year-old house and retrofitted for efficiency. The changes will take years to pay for, but energy consumption has dropped 55 percent. They heat it with scrap wood. Solar panels make their electricity. They have surplus to sell. This offsets the natural gas used only to heat water.

“It takes a groundswell of people doing that sort of thing,” Stoner said. His own contribution is just a “blip in a bucket.” But if such stories are told to and inspire enough

people, he said, that groundswell might occur.

He also sees hope in the “transition movement” aiming to help towns prepare for peak oil and climate change.

A LAWYER

Stephanie M. Smith, 55, Prairie Village, Kansas, began with economics in college. She said, “I studied just enough to know that the powers that be didn’t know what the hell they were doing.”

She went on to law, believing in political action and seeing that many politicians are lawyers. People outside the field often believe lawyers are in it only for the money. Smith said, “A whole lot of lawyers go to law school because they want to change the world.”

Now, she said, “I am extremely pessimistic about the possibility of political action.” Exhibit A: President Obama’s hiring from Wall Street to lead economic reform. She said, “The whole political system is so entrenched with the power system that even if you change the faces, things won’t change unless the power system wants to change.”

Speaking at the 2007 Prairie Festival about scarcity of oil, water, and minerals, James Howard Kunstler further radicalized Smith. “I think the West’s idea of inexorable progress is all wrongheaded,” she said. “I think the idea that growth will save us all is unworkable.” Smith is Catholic, and believes that we will always have the poor, and that human history is not linear, but cyclical.

“If people stop consuming and stop buying,” she said, “you can have a revolution that way.” But the movement will have to come from the ground up: “Set the example for one’s family and friends.”

An example of hope for Smith: Her home county, a Kansas City suburb, shifting over 40 years from domination by upper

class business interests to more social and environmental concern. The crust might simply have moved elsewhere, she said. “But there is a change in attitude in my part of the country.” A town dweller, she remains interested in agriculture and farmers because, as she said, she is a Kansan.

Smith hadn’t turned off her air conditioning, but uses it less, and the clothes drier seldom. She gardens and looks for locally grown food. She resettled near her parents. She drives an older car – manufacture of new cars can require more energy than they save on the road. She must drive to do her job. But the office is near home, and she walks to church, the drugstore, the grocery, and several restaurants. Out of economic necessity, she learned as a girl to bake bread and can, and now she is learning to spin.

And she moved to practicing law oriented more toward family: estate planning, wills, and trusts. She hopes this always will be in demand, even after economic collapse. “Whereas those mergers and acquisition guys might not be needed so much.”

A WRITER

Brian Kamsoke, 41, moved in July to Kansas from central New York, to teach and pursue a master of fine arts degree in writing from Wichita State University. This was his first time at a Prairie Festival, after learning of it and The Land Institute from a friend.

He said he was probably pessimistic. “I would love to be optimistic,” he said. “I think there are just too many forces conspiring against that ... chiefly population growth.”

Kamsoke thinks Americans are more attuned to the ideas of conservation and sustainable living, but only because they’ve already hit limits for use of their own resources. The bigger problem will be in de-

veloping countries, who say, “How can you preach to us? That’s our way of growing our economy, just like you did.” He said, “To change that is going to be very difficult.”

Moving of food and growing it for local consumption concerns him, and he thinks the same way about energy in general: Harnessing and using energy locally is better for the environment. Kamsoke puts his stock in wind energy. He doesn’t put stock in Washington or other capitals. “Politics is just like corporations,” he said. “They’re reactive. They’re not proactive in any way.”

Kamsoke thinks there will not be change until it is forced by nature. He advocated education and greater awareness of the natural world. “I think we lost a lot in respecting nature and living in nature” by ignorantly supplanting Native Americans, he said. “They had a symbiotic relationship with the natural world.” He said a small segment of Americans understand Indian culture and what was lost. Others are yet only nostalgic for something their own culture lacks.

For education, Kamsoke emphasized discerning calls for conservation and sustainable energy that are legitimate, and those that are fronts. Example: natural gas is touted as clean fuel. It is cleaner than coal or petroleum, but still releases carbon dioxide by the tons.

Kamsoke also advocated getting people out into nature. “Know what it’s like to walk in the woods,” he said. “Or to experience wetlands and grasslands.”

A MINISTER

Susan Jantzen, 56, like many other people in Newton, Kansas, is a Mennonite. But she directs ministries at a United Methodist congregation. And though an advocate and aspirant for sustainability, she is careful to listen rather than take sides. If a potential



"Early Snow," drypoint and aquatint, by Arthur W. Hall. Courtesy of The Birger Sandzen Memorial Gallery, Lindsborg, Kansas.



adversary isn't listened to, she said, they remain an adversary. "Does that make me less committed?" she said. "No. I'm committed to sustainability."

Her husband keeps a garden in the front yard. Their house uses passive solar heating. He walks to church. They heat with wood. "All of that is very overt," Jantzen said. She is less so. "Our home speaks of what it is. But it's not all there is." She wants to listen to people who don't even understand sustainability. "I want to share my life with them too."

Jantzen came to this approach partly from living for three years in Chad. With far more on the line, Africans still gave her room to live and learn. She was granted dignity. She now feels she must grant dignity to other North Americans, though how they live in whole is an ecological threat to the globe. All people have hopes for their children and grandchildren, and want recognition that they care.

"It takes a long time to learn another language of understanding," Jantzen said. And, "We don't always know how to give it words, we don't always know how to reconcile that with other loyalties." She means that people have competing loves and loyalties, for individuals, for arts, for families, for work, and for nations. She said we must honor existing loyalties, listen carefully, and acknowledge the goodness of people's sense of purpose even when the path isn't the one we have chosen. And living our own lives with purpose, embracing sustainability, sends a powerful message. If we do that and while honoring others, Jantzen said, we create the opportunity for mutual understanding.

"The power and joy of a sustainable world comes through people," she said. "It isn't laid upon them. It's not a jacket. These are urgent times for sustainability questions.

My life work is to create relationships where they can authentically advance sustainability.” Others are not to be laughed at or derided. “We need everyone.”

Jantzen called places like The Land Institute the “heavy lifters” for our legacy, working with sustainability’s nuts and bolts. Her work is looking at the huge gulf between those who understand sustainability and those who don’t.

The church always searches for renewing metaphors, and for frameworks to build truly sustainable living. For this she values the Hebrew Bible’s complex address of land care, and Ellen F. Davis’ “Scripture, Culture and Agriculture,” which engages Wendell Berry’s writings.

Jantzen said she must believe God wants us to take care of the earth, and so she calls herself an optimist. “Externally, no, but internally most humans desire a sustainable world,” she said.

“Every person has a confluence of experience in their life” affecting how they may come to embrace sustainability, she said. They aren’t malicious, and they have a set of experiences to honor. We must maximize understanding and minimize animosity, Jantzen said: in the end, animosity will be a huge factor – it already is. “We are all going to have to pull together.”

A GROWER

Anthony Baguss, 37, earns his keep by computer networking and repair in Anoka, Minnesota, while participating in a new, one-year diploma program in sustainable food production at Minnesota State Community & Technical College in Fergus Falls. The program is modeled on the work of farmer and writer Joel Salatin, and also focuses on Wendell Berry’s work.

Baguss said he’d grown up with computers since he was 12. He bought into

“Technology is the future.” But a few years ago he began feeling that it drives us the wrong way. He began gardening. He learned about permaculture. He has become strongly interested in growing food plants both wild and domestic. He raises perennial berries in his yard. But he’s also interested in community supported agriculture, and so sees the need for mastering domesticates too. He said, “Not many people are going to buy wild foods at this point.”

Overall, Baguss said, “I am pessimistic, but I’m trying to be more optimistic. And I see sustainable foods and being on the land as being optimistic ... as opposed to working on computers. I don’t think it’s all lost.” When working with computers, he said, “I see us going backwards. There’s nothing sustainable about computers.” He said they aren’t produced locally, and they put people into separate spaces: “My son and I would text each other rather than talk.” While gardening, he said, “I feel very optimistic.”

It was after being laid off that he canceled his family’s cable TV. “When I stopped watching TV, things seemed to make a lot more sense,” Baguss said. He said television and computers are about consumerism and unsustainability. His two, teen-age boys came not to miss TV. They can go to friends’ homes if there’s something they really want to watch. But they and his wife won’t yet part with the Internet, though he’s ready. “All this technical stuff – I’m pretty much done with it.”

It’s not just the technology itself, but the corporate control. His local Internet provider, like so many others, has been snapped up by a larger corporation, and with that has come loss of connection and control.

If we go back to living in community more like the Amish, Baguss said, many problems would fade. “I’m more of a think locally, act locally guy,” he said. “We can

make everything we need here. Maybe not electric cars. But do we need electric cars?"

Salatin's "You Can Farm" was one of the most practical things Baguss has read. Also formative was Berry's "The Gift of Good Land." Most important was Masanobu Fukuoka's "The One Straw Revolution." If he were giving a talk at the Prairie Festival, Baguss would say, "Don't fall too quickly for what is made of the day's issues." Peak oil and global climate change cause fright that can be played on. Markets form around them. Witness corporate co-option of the green movement. Fearful people follow those who may end up against their principles. Baguss said, "We just have to be very careful" that our good intentions are not co-opted.

A STUDENT

Adelaide Roy, 20, lives in Norman, Oklahoma, working in retail and as a volunteer for a food bank, including in its garden, and at a natural history museum. In spring she'll start school at Oklahoma State University. For most of the year she was an AmeriCorps literacy tutor for poor children in Miami.

She came to The Land Institute and the Prairie Festival, for the first time, because she seeks a purpose. She's interested in food science.

Roy said, "I feel that the only way to do anything is to be an optimist," though, calling herself old-fashioned, she sees technology as separating people.

She feels she needs to listen as a young person, and doesn't want to talk without knowing enough. But she sees much of the

world's challenges arising from ignorance – blinders maintained by government and media to perpetuate a system committed to making money. Desire to change comes with recognition, she said.

Roy was born in Chicago but moved to Oklahoma as a child and enjoyed growing up on 5 acres of scrub forest. No farming or ranching, but room to roam. "I learned the significance of nature that way." Now she lives in town. When stressed, she seeks a natural setting. And she thinks city-dwellers' disconnection for the land denies them some needed recognition of truth. She helped her Miami students connect by taking them outside to collect flowers.

But they lacked fresh produce, couldn't raise food, and their nutrition suffered. "I'm a real fan of community gardens," Roy said, especially on reclaimed lots. She values them not just for their growth of food, but of community.

Overall, she said, we need a paradigm shift. She thinks Washington could change if the lobbying structure was changed. In addition to learning about food science, she wants to become a better leader.

A CONCLUSION

Back to Howard Stoner, the college instructor: when preparing for a Prairie Festival, he doesn't tell colleagues that he's going to a festival, but to a conference. And the meeting really is mostly talk. But Stoner said the festival name fits. "It's that sense of celebrating when you're in the middle of what I call doom," he said. "Face the music, but don't forget to celebrate."

Perfection of means and confusion of goals seem – in my opinion – to characterize our age. – Albert Einstein, "Ideas and Opinions"

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