SUSTAINABLE FARMING Quarterly

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Economics and Environment

Putting the Winning Numbers Together

By David Granatstein, sustainable agriculture coordinator, and Kate Painter, agricultural economist, Washington State University —

Money talks, statistics can lie, and 10 experts will have 10 opinions about your pocketbook.

That said, growers still need an economic compass to help guide them in a direction that pays the bills today and maintains an investment for tomorrow. The compass must help them navigate through farm program rules, environmental regulations, and market forces beyond their control.

Lack of economic information on alternative farming systems has often slowed farmer adaptation of new practices, due to risk of the unknown. Now, several recent economic studies may help dryland cereal producers assess cropping alternatives from their armchairs before risking their farms from their tractors. One study for eastern Washington is presented here. Others will be described in future issues.

Caution Advised

When reading any economic study, be sure to first look at all assumptions that were used. Yield and price assumptions will determine farm income results. Farm program assumptions will influence choice of rotation. In reality, yields vary from farm to farm and prices vary from day to day. Farm program rules change more than most care to remember.

Many economic studies are best used by farmers to make relative comparisons among practices or systems given a certain set of assumptions. These studies represent a snapshot in time. With today's computers, it is easy to change initial price assumptions in order to develop a series of scenarios as the cost of fertilizer goes up or the price of wheat goes down. Studies using this approach can present price sensitivity analyses, leading to a series of decision rules that indicate the economically smart choice under several price situations.

More Economics, Page 6

Montana's Farm Improvement Clubs Are a Collaborative Learning Community

By Nancy Matheson, sustainable agriculture project coordinator for the Alternative Energy Resources Organization based in Helena, Mont. —

The one-room rural schoolhouses are mostly closed, the kids bused to distant towns. Gone are the Grange halls, the community centers, and local Farmers' Union chapters with their box socials and sing alongs.

The loss of these rural community structures is more than sentimental, for "community" seems to be a fundamental human need. Plenty of people still live in rural America, but more and more it is without the support of rural community institutions and networks.

Actually, that's been the case for half a generation now. So why should a lack of community be of special concern now? Because without community, isolated farmers and ranchers—that together make up what we call "agriculture"—are finding it difficult to prepare for a future that

More Farm Clubs, Page 2

requires new production systems, methods and and new markets. A world with shrinking supplies of fossil fuels, topsoil, plant and animal species and clean water is demanding that agriculture protect what remains. Farmers and ranchers themselves are leading the search for sustainable ways to produce food and fiber. AERO's mission, in part, is to support them in their search.

The Alternative Energy Resources Organization (AERO) was formed in 1974 to support citizens in their search for renewable energy sources and technologies. In 1990, AERO started a program designed to help agricultural producers in Montana learn how to farm more sustainably in this semi-arid region of mostly small grains and beef production. The land grant universities didn't seem too interested in helping prepare people for a sustainable future, and the farmers in AERO's membership already knew what questions they wanted answered. So AERO put the word out in the general agricultural community that it had money to give local groups of farmers and ranchers for projects they would design to help them learn about sustainable agriculture. AERO's main criteria for selecting projects for funding were that they be farmer-driven, and that each group proposing a project include a minimum of four producers.

What AERO didn't know in 1990 is that the program would provide something every bit as valuable as new information on alternative farming practices: community.

BUILDING COMMUNITY

AERO decided to call the groups of farmers it would support "farm improvement clubs," reminiscent of the corn and beef improvement clubs sponsored by the Extension Service in the Midwest in the 1940s and 1950s. It was, in part, those clubs that so effectively spread the technology of post-war, industrial agriculture throughout rural America. Perhaps the same mechanism could help spread sustainable agricultural technology across Montana.

AERO's program began with six farm improvement clubs made up of about 35 families. By the beginning of 1993, the program had grown to 20 AERO-sponsored clubs plus 5 clubs sponsored by the state Department of Natural Resources and Conservation in a replication of AERO's program. Together, approximately 175 farm families spread across Montana are learning about different aspects of sustainable agriculture that they have chosen.

"Out here it is easy to feel isolated and alienated and not look to people as being caring or understanding. . . . Club gatherings help break that down, and to see each other more humanly," said a club member from a remote corner of the Fort Belknap Indian Reservation after her club's first year in AERO's program. After an annual gathering of all the clubs, another member of the Fort Belknap group said, "Isn't it wonderful, these people are looking at the world the way we see it. They are talking about the plants."

Club members report a shedding of their feelings of isolation, and sometimes embarassment, that often come with breaking from convention. As Clint Peck, editor of the *Montana Farmer-Stockman* observed, "I think a lot of that has to do with people sharing ideas and realizing you're not a fruitcake if you're out there trying to do something from a standpoint of conservation, because people are working together. It is a lot easier to do things. . . if you've got two or three people to support you."

A CATALYST FOR CREATING CHANGE ON MONTANA FARMS

Besides providing a sense of community, the farm improvement club program is a catalyst. The small grants of up to $800 each are enticing producers to move from thinking about an experiment, to doing it. "Our group probably wouldn't even have started doing this if AERO hadn't came up and give us a little nudge, financially and technically," according to first-year club member Mark Haugen, a dryland wheat farmer from Montana's Hi-Line in the north central part of the state.

"That's the same with our group. We'd have never started our group if it wasn't for this AERO project, and because of this we've acquired some fairly useful data that we've collected ourselves," said grain and cattle producer Bud Barta of Lewistown, Mont., located in the

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geographic center of the state. At the same time, Barta points out a result of the farmer-driven aspect of the program, "We know how [a practice] actually works on our own farm, rather than how it works at the university or at the experiment station. We have direct hands-on experience with the data so we have more confidence in it, I think. I'm real happy with how it's turned out. I'm real happy we've been able to share and learn from everyone else, too," Barta added.

New Relationships

The farm improvement club program has created a learning network beyond each individual club. The clubs themselves make up a network through which information and learning are exchanged, and many of the clubs are providing opportunities for the public to see and learn from what they are doing. Public events hosted by clubs include farm tours and field days, workshops and seminars.

Most clubs have invited in at least one local agricultural technical assistance provider or research scientist to help with the club project. District soil conservationists and county agents are providing organizational support (calling club meetings, taking minutes, writing reports) and helping with project design and recordkeeping. Several clubs are near experiment station research centers and have the cooperation of scientists with project design, data collection and analysis. Club members and technical assistance providers have reported that the new friendships they are developing with one another are important. According to Dave Oien, grain farmer from Conrad in the Golden Triangle, "It has been great working with the scientists. I've really built a relationship with Grant [Jackson, soil scientist]. And I think it has been good for him, too."

A rancher from the Montana community of Terry, which is on the Yellowstone River as it approaches North Dakota, said of his club's work with the local county agent, "This has strengthened our friendship. We talk a couple of times a week now."

Institutional Change

These friendships and the two-way exchange of information and learning are leading to new ways of working and new perceptions of how agricultural service institutions can and should serve producers. These relationships are also exposing scien-

How the Farm Improvement Club Program Works

The Alternative Energy Resources Organization (AERO) established a network of farm improvement clubs in 1990 to:

- enable local groups of farmers and ranchers to meet their own needs for information about sustainable agriculture;
- build supportive networks of producers, agricultural service and research personnel; and
- make practical information about sustainable agriculture in the region widely available to farmers and ranchers, scientists and their institutions, and policymakers.

Once each year in January, AERO offers small grants of up to $800 each to local groups of four or more producers who propose to get together to learn about something they identify related to resource conservation and enhancing their operations. The granting process is a competitive one, with proposals having to meet specific criteria. Most important, the group has to be farmer-directed. Four or more producers must be involved. The methods proposed for carrying out the project have to be practical. The project process has to promote members sharing their learning experiences, and it should build a foundation for ongoing group activities after AERO's support is discontinued. AERO offers each club a maximum of three years of support, but commits just one year at a time.

AERO funding is used to cover participants' out-of-pocket expenses, such as seed and inoculant, soil and tissue test analyses, travel, phone, postage and printing, and speakers' fees. In 1992, AERO established a small fund to cover out-of-pocket costs of club technical assistance providers as well, primarily travel and soil and tissue test analyses.

Besides the small grants, AERO provides each club with technical and organizing assistance. AERO staff helps with farm tour organizing and publicity. Staff also serves as the hub of the club network, facilitating inter-club communication and learning. AERO hosts an annual face-to-face gathering of all the clubs each January where they describe for each other what they're doing and learning, what problems and barriers they've run up against, and what new questions are emerging.

tists, extension agents and others to sustainable agriculture and giving them an opportunity to work in new areas. Their acceptance of sustainable agriculture is increasing as a result. "I have a better understanding of what farmers are trying to do," said Central Ag Research Center superintendent David Wichman, after he worked with one of the clubs.

AERO was surprised by the program's potential to begin creating institutional change. Several research scientists and one research center director have told AERO that they changed their research agendas as a result of working with the clubs. Direct exposure to farmers' problems and questions, and working with them as peers is doing more to bring the land grant university's attention to sustainable agriculture than anything else AERO has tried. This is truly a bottom-up approach.

SHARED LEARNING

Change is taking place fastest within the agricultural community itself. One farm improvement club member pointed out that it took Dr. Jim Sims, research agronomist at MSU, almost 10 years to get the university to consider trying cereal-legume rotations similar to those he had seen in Australia in 1968. "And now [with Sims' support], we've got these farmer groups going in Montana, spread from one end of the state to the other, and just in three years. I think that's a tremendous breakthrough to get an alternative cropping program going," said club member Mark Haugen.

The program is able to accommodate tremendous diversity—in people, geography, and project goals and activities. On-farm research or demonstration is but one approach clubs are taking. Some clubs are pursuing market research and development; one formed a marketing cooperative in 1992.

Another club is teaching itself and the local community about Holistic Resource Management. The latter's activities have included seminars and an air-conditioned bus trip through the eastern third of the state to learn from ranchers who have experience using intensive rotational grazing practices.

One club has worked with sixth-graders in their classrooms, teaching them what the club has learned about various aspects of gardening and sustainable agriculture.

Individual club members include long-time AERO members and producers who have never ventured into "alternatives" before. From certified organic producers to leaders in mainstream farm and commodity organizations, from legislators and county commissioners to Indian tribal members, from cattle ranchers to growers of fruit and ornamentals, men and women—all are participating in the farm improvement club program. And they are talking to one another and learning from each other.

Six hundred miles and the Continental Divide separate the western-most club in the Bitterroot Valley from the eastern-most club at Scobey, which is practically in Saskatchewan. These distances span Montana's entire agroclimatic spectrum. Farm improvement club members raise everything from garlic, melons and hay on irrigated land, to dryland small grains and legumes, to grass for cattle and sheep.

GAINING PUBLIC SUPPORT

Three factors have contributed to the program's success:

- The club projects are farmer-directed;
- Members work as a group within a supportive community network, and
- The clubs are diverse and have a wide scope of goals.

This success was noticed early in the program by the head of the Montana office of the federal Soil Conservation Service (SCS), Dick Gooby. Dick sat down with the administrator of the Conservation Districts Division of the Montana Department of Natural Resources and Conservation to figure out a way to combine resources to expand AERO's program. Gooby's objective was to see a farm improvement club in every agricultural county in Montana (more than 50).

After a conversation with AERO, other interested agencies and organizations and Montana State University and Extension, Gooby and others founded a coalition called Gaining Ground to work toward that objective. In 1992 and 1993, the state legislature and the SCS allocated money for additional clubs. Commitments of on-the-ground support for the clubs from scientists, county agents, district conservationists and other field staff were made by the respective agencies and the university.

The new state-sponsored clubs have joined the network of AERO clubs, increasing the size of the learning and support community. This public-private partnership is creating new relationships and new roles to

better serve the emerging needs of agriculture, and is serving as a model for other states. (See Kellogg article at right.)

Creating Change and Reaping Economic Benefits

The farm improvement club program is a catalyst for change. The clubs serve as a support group and an entry point into sustainable agriculture for producers that may have previously felt isolated or unsure of where to start.

What the farmers learn about a particular farming practice is almost secondary to the social and community benefits of the learning process itself. The group aspect multiplies the learning, lends credibility in the larger community and with agricultural service and research agencies, and makes the project fun for the participants. Many of the clubs report broader support among the local agricultural community as a result of club activities. A majority of club participants say they have either realized an economic benefit from their club participation or expect one. The most common answer participants give when AERO staff asked what they most like about the program was that it is fun. ❐

Kellogg Foundation Supports Region's Shift to a More Sustainable Agriculture

The W. K. Kellogg Foundation has awarded a three-year, $617,000 grant to a network of agricultural and conservation organizations that formed recently to help Montana, Idaho and eastern Washington farmers and ranchers make the transition to sustainable farming systems.

The grant will enable the Ag Options Network to provide information and technical assistance to further the long-term viability of the region's agriculture. It will do this by building on the success of Montana's 3-year-old farm improvement club program, expanding the level of assistance to local farm-based groups in Montana and establishing similar peograms in Idaho and eastern Washington.

The Alternative Energy Resources Organization (AERO) will administer the Kellogg grant. Based in Helena, Mont., AERO has 500 farm and ranch families and other active citizens as members.

The Ag Options Network will address problems farmers and ranchers face as they seek ways to meet today's environmental and economic challenges.

In addition to AERO, the Ag Options Network includes:

• Gaining Ground, a coalition of Montana ag and conservation groups and public agencies, supports a variety of farm improvement clubs across Montana.

• Idaho Rural Council, a rural citizens' organization based in Boise, Idaho, working with farmers and other rural people to improve the economic vitality of Idaho's rural communities.

• Montana State University and James R. Sims, cropping systems agronomist at Bozeman. Sims' research and demonstration work is key to providing technical assistance to farm and ranch improvement clubs in Montana.

• Palouse-Clearwater Environmental Institute, a rural organization based in Moscow, Idaho, working to increase involvement in environmental issues and farm alliances among farmers, consumers and environmentalists in Idaho and eastern Washington.

"The Kellogg grant will allow us to expand the farmer-directed club idea and share what we are learning with other producers in the region," said John Hays, a Livingston, Mont., farmer who has spearheaded a farm improvement club.

The W. K. Kellogg Foundation, of Battle Creek, Michigan, was established in 1930 to "help people help themselves." As a private grantmaking foundation, it provides seed money to organizations and institutions that have identified problems and designed constructive action programs aimed at solutions. A majority of the Foundation's grantmaking is focused on the areas of youth; leadership; philanthropy and volunteerism; community-based, problem-focused health services; higher education; food systems; rural development; groundwater resources (in the Great Lakes area); and economic development (in Michigan). Programming priorities concentrate grants in the United States, Latin America and the Caribbean, and southern Africa.

As a private grantmaking foundation, it provides seed money to organizations and institutions that have identified problems and designed constructive action programs aimed at solutions. ❐

ECONOMICS, FROM PAGE 1

A shortcoming of most farm economic studies is their inability to consider external costs — such as soil erosion, loss of wildlife habitat, groundwater contamination, and deterioration of rural communities — within the budgeting process. These costs can be difficult to quantify. They typically are borne by society at large. By including them, where possible, in economic analyses, growers can get a more realistic picture of the relative benefits and costs of different farming systems to themselves as well as to the larger society.

ALTERNATIVE CROP ROTATIONS IN EASTERN WASHINGTON'S WHITMAN COUNTY

The eastern Palouse region is a highly productive dryland farming area in which crops of winter wheat, spring barley, spring peas and spring lentils predominate. A crop can be grown every year. Smaller acreages of grass seed, rapeseed/canola, and spring wheat are also planted. Winter wheat historically has been the most profitable crop, due to its high yield and government subsidy. At the same time, soil erosion typically is greatest during winter wheat production.

Two surveys were conducted during 1989 and 1990 by Washington State University and University of Idaho researchers to determine the extent and type of alternative farming practices in the region, and to characterize typical farming practices on more conventional farms. Researchers were Kate Painter, Curt Beus, Douglas Young, David Granatstein, David Mulla, Don Dillman, Baird Miller, David Bezdicek and John Carlson.

These surveys, along with results from several field trials, provided the raw material for a number of economic studies that examined the relative profitability of different crop rotations, their environmental impacts, and the influence of government policy on the relative attractiveness of each rotation.

Results were used to develop *1992 Alternative Crop Rotation Enterprise Budgets, Eastern Whitman County, Washington* (Cooperative Extension Bulletin EB1725, WSU). A winter wheat-spring pea (W-P) rotation and a winter wheat-spring barley-spring pea (W-B-P) rotation were considered as conventional systems. Four alternative systems in use on commercial farms were studied: winter wheat-spring barley-clover green manure (W-B-Cl), winter wheat-summer fallow-winter rapeseed (W-F-R), 6-year bluegrass plus 18 years of grain crops and pulses (grass + crop), and winter wheat-winter wheat-spring wheat (Cont.W). A fifth alternative rotation, winter wheat-spring pea-black medic green manure (W-P-M), was also studied, but it was based solely on experimental data and not on a successful farm application. All calculations used a standard farm size of 1,275 acres.

In addition to developing enterprise budgets, Painter and Mulla estimated the potential soil loss and nitrate leaching for each rotation. Painter then calculated the cost of the soil erosion and subtracted it from the net returns to illustrate profitability when some external costs are included.

COSTS AND RETURNS

Enterprise budgets use variable costs and fixed costs in determining total costs and returns. Fixed costs are those costs that occur regardless of whether a crop is planted and produced. These include equipment depreciation, taxes, interest, housing and land ownership. Variable costs are costs directly associated with the production of a crop, such as machine operation, hired labor, purchased inputs, and services. Fixed and variable costs are added to determine total costs, which are then subtracted from total returns to determine net profit or loss. Total costs vary significantly from farm to farm. Thus it is sometimes more useful to examine net returns over variable costs when making relative comparisons among systems.

The variable cost composition of the rotations is compared in **Table 1**. The green manure systems had the lowest variable cost, but sacrificed a year of income. Costs were highest in the continuous wheat systems due to greater fertilizer and pesticide use. Variable costs represented 43 percent to 58 percent of the total costs.

Returns over variable costs are presented in **Table 2** for three years. Returns over total costs (data not shown) are negative for every system except winter

Table 1. Cost Composition of Crop Rotations

Rotation	Variable Costs: Fertilizers and Pesticides	Variable Costs: Field Operations and Other Costs	Total Costs
	$ per acre		
W-P	53	84	255
W-B-P	51	73	244
W-B-Cl	22	53	170
W-F-R	29	52	167
Grass + Crop	50	79	248
Cont.W	80	64	254
W-P-M	14	54	158

wheat-summer fallow-winter rapeseed (W-F-R), in 1989. The change in relative profitability is illustrated by looking at several years of results. The grass rotation has a large fluctuation in net returns due to the sizable changes in grass seed price that can occur from year to year. Low grass seed prices in 1990 and 1991 hurt the profitability of the rotation. But by 1992 prices had climbed to nearly $1 per pound, making this system very profitable

Table 2. Profitability of Conventional and Alternative Crop Rotations

Rotation	Net Returns Over Variable Costs — 1989	1990	1991
	$ per acre		
W-P	87	109	64
W-B-P	101	108	77
W-B-CI	72	59	57
W-F-R	93	81	73
Grass + Crop	115	103	75
Cont. W	79	67	57
W-P-M	72	87	58

NOTE: Market prices used were taken from Washington Agricultural Statistics. Total price was calculated using target price, base acreage, deficiency payment, and transportation charge considerations.

again. The grower using this system takes a long-term view and keeps much of his land in this system whether grass seed prices are high or low. He also has been able to store some seed during low price periods and wait until the price increases.

Environmental Impacts

Two environmental issues of widespread concern in the Palouse are soil erosion and groundwater contamination by agrichemicals. These were estimated for each cropping system. Costs of soil erosion were then estimated and included in the budgeting. Soil erosion rates were predicted for each rotation using a version of the Universal Soil Loss Equation adapted for the region. Relative agrichemical leaching potential was estimated using an attenuation factor approach, which relies on rainfall, soils, and chemical composition data to predict leaching through a certain depth of soil.

All of the rotations meet conservation compliance as mandated by the Farm Bill (**Table 3**). The conventional rotations had higher predicted soil losses than the alternative rotations. Excellent erosion control was achieved in the continuous wheat system due to use of no-till and minimum till along with high residue crops.

There was little risk of agrichemical leaching below 0.25 meters of soil depth except for nitrate. Nitrate leaching potential at 5 meters was near zero due to

Table 3. Predicted Soil Loss and Nitrate Leaching (beyond 0.25 m) for Crop Rotations

Rotation	Soil Loss (tons/ac/yr)	Nitrate Movement (lb/ac/yr)
W-P	6.53	12.54
W-B-P	6.26	9.75
W-B-CI	4.22	3.79
W-F-R	5.74	12.46
Grass + Crop	4.90	16.92
Cont. W	2.61	20.71
W-P-M	2.09	no data

denitrification and immobilization processes. While the rotations varied considerably in potential nitrate leaching, the calculations indicated that agrichemical leaching in these systems is likely to be a problem only for nitrogen in areas of shallow water tables.

The costs of soil erosion, both on-site and off-site, are estimated in **Table 4.** These reflect the loss of nutrients and inherent productivity on-site, as well as costs of cleaning road ditches, reservoir sedimentation, fish habitat impacts, and recreational losses off-site. When these costs are subtracted from the net returns over variable costs in Table 2, the relative profitability per acre among rotations does not change appreciably. While the per-acre on-site damage may seem small, the estimated environmental damage due to erosion is substantial ($7,000 to $22,000) when considered over a whole

Table 4. Estimates of On-Site and Off-Site Erosion Damage for Crop Rotations

Rotation	On-Site Damage	Off-Site Damage
	$/ac/year	
W-P	1.55	16.19
W-B-P	1.49	15.52
W-B-CI	1.00	10.46
W-F-R	1.36	14.24
Grass + Crop	1.17	12.15
Cont. W	0.62	6.47
W-P-M	0.50	5.18

REGIONAL SUSTAINABLE AGRICULTURE NETWORK MOVES AHEAD

Working together to support and promote sustainable agriculture in the West is crucial, agreed local, state and Canadian provincial sustainable ag groups attending a May meeting in Park City, Utah.

The first organizational meeting of the western Sustainable Agriculture Working Group (SAWG) drew representatives of farm organizations from Washington, Oregon, Idaho, Montana, Alberta, and New Mexico's Zuni Nation.

The western SAWG is a new grassroots coalition organized by the Alternative Energy Resources Organization (AERO) and the Palouse-Clearwater Environmental Institute (PCEI) to facilitate networking in sustainable agriculture. The meeting was held to identify the common ground among potential member groups and plan future strategies. An organizing committee will work over the next several months to build the coalition's foundation.

Broad issues identified include farmland transfer, rural community vitality, research, education, regional food systems and marketing, and the pros and cons of adopting sustainable farming techniques.

Once the SAWG determines how it will work together, it can begin choosing issues for action. As early as this fall, a large regional gathering will be scheduled to celebrate the new network working for sustainable agriculture.

For more information on the Sustainable Agriculture Working Group project, call AERO at (406) 443-7272 and ask to be put on the mailing list of the Agricultural Task Force, which is overseeing AERO's work in this regional effort. ❐

ECONOMICS, *FROM PAGE 7*

farm (1,275 acres in this case). This attempt at assigning an environmental cost contains much uncertainty in the procedure and estimates, and more refinement is needed. While such calculations may be useful in comparing systems, they cannot substitute for site-specific evaluations when determining the performance of an individual farming operation.

THE BOTTOM LINE

Based on this study, growers in the eastern Palouse appear to have some economically viable alternative rotations that can decrease soil erosion. However, each of the alternative systems has its pitfalls. The wheat-barley-clover green manure system was used extensively earlier in this century. Recently, farmers have had problems establishing clovers due to insect pest problems and soil acidification. Herbicide drift and carryover has damaged clover plantings. The wheat-pea-medic system performed well in experimental plots, but medic establishment and weed problems have prevented its use on a farm scale in the Palouse. In contrast, medic-wheat systems are being successfully implemented on dryland farms in Montana. The continuous wheat rotation excels in its soil conservation, but long-term use of this system conflicts with farm program rules and will likely lead to serious weed and disease problems.

The remaining two rotations, while agronomically sound, are prone to market price volatility of rapeseed and grass seed. Use of rapeseed decreases soil erosion and is more profitable than barley or peas, given the assumptions of the study. Both rapeseed and grass seed markets are limited compared to wheat, and large plantings of these crops could erode their prices.

More flexibility in farm program rules would allow growers to better match rotations with market changes and to the needs and capabilities of different fields and landscape positions. Incentive payments for proven resource-conserving systems would help reduce growers' risk. And economic budgeting that attempts to identify the external costs of our current agricultural practices will present a more accurate picture to farmers, consumers and policy makers alike. The unanswered question is whether society is willing to help pay the full cost of the abundant food we enjoy.

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Going Whole Hog' for Soil Health

Boiler Ash That's Now Wasted Has Promise as Economical Amendment

Dr Steve Wiseman, Conservation Extension forestry agent for Lewis County, Wash. Reprinted from Pacific Northwest Sustainable Agriculture —

Hogfuel, the rather strange name given to coarsely ground wood and bark wastes, is commonly burned by industry or public agencies to produce power. Resulting truckloads of wood ash are then discarded in landfills.

Instead, why not apply the ash to crop or forest lands? Certainly the idea is not new. Gardeners and small farmers have long prized wood ash as a useful soil amendment, providing small amounts of nutrients and acid-neutralizing or liming qualities. Hogfuel boiler ash provides the same (Table 1).

Its value as a liming material depends on its calcium carbonate equivalency, which varies from 10 percent to 60 percent, depending on the type of hogfuel burned and combustion conditions. The calcium carbonate equivalency of the ashes in Table 1, with an average of 42 percent, means these ashes, on average, would be a little less than one half as effective at neutralizing soil acidity as would standard agricultural lime. A soil needing two tons of lime per acre — the common recommendation — would need a little more than four tons of boiler ash to achieve the same result.

Nutrient concentrations in boiler ash are small relative to commercial fertilizers. Nevertheless, when applied at recommended liming rates, significantly important amounts of calcium, magnesium, potassium and phosphorus would also be furnished to the crop.

Following extensive testing, Dr. Alton Campbell, an associate professor in the Forest Products Department at the University of Idaho, concludes that wood ash appears to be a safe liming agent and soil amendment when applied at agronomic rates based on soil fertility needs and chemical composition of the ash. An added attraction is that hogfuel boiler ash is registered for use by organic growers.

Not only is boiler ash a good soil amendment, it has the promise of being inexpensive. Discarding ash in landfills is increasingly costly for ash producers. Because land application may be less costly, ash producers appear willing to pay some, or even all, of the costs of delivery, application and incorporation of the ash. Waste utilization companies are available and anxious to include ash utilization as one of the business offerings. Of course, gardeners and crop producers would also have the opportunity to haul, apply and incorporate boiler ash on their land.

Table 1. Average Characteristics of a Sampling of Hogfuel Boiler Ash

Alkalinity (pH)	12.3
Calcium Carbonate Equivalency (percent)	42.0
Calcium (percent)	13.8
Magnesium (percent)	2.0
Potassium (percent)	4.0
Phosphorus (percent)	0.9
Sulfur (percent)	0.3
Boron (parts per million)	109
Zinc (parts per million)	435
Copper (parts per million)	92
Chromium (parts per million)	23
Nickel (parts per million)	27

Despite the attractions, however, certain obstacles have yet to be overcome before hogfuel boiler ash can be widely used as a soil amendment. Ash having a pH of 12.5 or greater is classed as a hazardous waste, and only by granting restrictive and conditional permits to an ash producer will land application be allowed by the Washington State Department of Ecology.

Further, products distributed and marketed as liming agents or fertilizers must be registered by the Washington State Department of Agriculture. This agency is proceeding cautiously with granting registration because of the highly variable chemical nature of hogfuel ashes. All wood ash contains trace contaminants (such as heavy metals), which by law are strictly controlled in registered products.

Also, agronomic recommendations for usage have not yet been well defined. The work by Campbell and others has shown that in using repeated applications of ash, agronomic thresholds for soil pH and potassium levels would be reached, limiting additional applications long before unsafe levels of heavy metals accumulated in the soil.

Although obstacles exist limiting the application of hogfuel boiler ash to crop or forest land, they are not insurmountable. Ash producers, waste utilization companies, public agencies, Cooperative Extension researchers and growers are collaborating to find ways to resolve concerns and find ways to divert hogfuel boiler ash from landfills to land application, bringing increases in soil productivity and profits for growers. Chances for success look bright. ❐

Increasing the Chances for People To Farm

The trick with agricultural "matchmaking' is to bring together retirement-age farmers who want to sell their land and beginning farmers who want to buy it

By Don Feist, Al Kurki and Mark Mackin of the Alternative Energy Resources Organization —

People are as important as any other resource in food production, so a critical step in the building of a sustainable agriculture is to address the intergenerational transfer of farmland ownership.

If a coalition of Montana farm interests is successful, their state soon will have programs in place to ensure that farms and ranches can be passed on intact to a new generation of farmers.

A growing percentage of farmers in the U.S. are nearing retirement age and there is no effective mechanism in place that allows first time and re-entry farmers to replace them. The reasons for this dilemma are many and the emerging consensus is that unless something is done soon, family farms may become a thing of the past.

The problem in Montana can be seen in population statistics for farmers in Montana and for counties in the eastern part of the state. Both populations declined, according to the 1990 census. In contrast, too many people are moving into the scenic mountain valleys in the western part of Montana and competing with agriculture for limited land.

These trends are of concern to AERO because farm group membership takes people not machines, and sustainable agriculture needs people willing to try new farming methods compatible with preserving rural communities, the soil and the environment.

After AERO held a workshop on the issue at its 1991 annual meeting, members began networking with other organizations nationwide and have collected good ideas for concrete and proactive change.

A pioneer in the effort to resolve the problem of an aging farm population and the lack of opportunity for entering farmers is the Center for Rural Affairs (CRA) in Walthill, Neb. Its response was to form Land Link, a two-year-old program that matches retiring farmers with beginning farmers so that the two can work out agricultural land transfers.

Beginning-farm programs now are operating in four other states. Minnesota, through its state department of agriculture, and Iowa, through its Extension Service, now have programs similar to the original Land Link model started by the CRA in Nebraska. North Dakota and Kansas have published directories of beginning and retiring farmers through their respective state departments of agriculture.

The challenge is a formidable one. Would-be beginning farmers outnumber retiring farmers by 40 to 1. The Land Link staff, however, emphasizes that farm transition is a process requiring thorough self examination by both beginner and retiree and, with enough determination, opportunity exists for beginning farmers. A national coalition of beginning farmer programs announced its mission is to foster the next generation of family farmers. The Family Farm Transition Network will meet once or twice a year to empower others wanting to start similar transition programs, and to support existing ones.

AERO farmers and public agency representatives are considering establishing a Land Link-style data base to match beginning and retiring farmers, with an added dimension: Prematch training or counseling by third parties to help retiring and potential new farm families with "people problems." Beginning farmers would receive farm management training, while retiring farmers would receive financial counseling. Adequate marketing and outreach channels are available, but their use will have to be carefully planned to avoid overwhelming the program initially or creating expectations that are too high.

Maintaining America's family-owned farms benefits everyone. Unique and general knowledge is retained; rural communities and the farming way of life thrive; local and state agricultural bases are strengthened; the alienation often associated with large absentee land holdings is avoided; and wildlife habitat is preserved.

For more information on beginning farmer effort in Montana, write Don Feist, 25 S. Ewing, Suite 214, Helena, MT 59601. ❐

Calendar

If you are aware of an upcoming event of interest to Sustainable Farming Quarterly readers, please send the information to SFQ, Alternative Energy Resources Organization, 25 S. Ewing, Suite 214, Helena, MT 59601 or call the SFQ editor at (406) 442-8396.

June

8: Washington State University Extension on-farm testing workshop, Harrington, Wash. Leaders will describe on-farm testing design and implementation for dryland farming, and explain how to read and interpret experimental results that have been statistically analyzed. Growers and field advisers are encouraged to attend. Contact: Bill Schillenger at (509) 659-0090.

July

8-11: International Herb Growers and Marketers Association 8th Annual Conference, Red Lion Hotel, Bellevue, Wash. Contact: Edward Styger, IHGMA, 1202 Allanson Road, Mundelein, IL 60060; (708) 949-4377.

14: Tour of legume cover crop and summer fallow research, Ag Canada Research Center, Lethbridge, Alberta, sponsored by Montana's Toole County Black Medic Farm Improvement Club. Dr. Joanna Fraser will describe her work on annual legumes for forage production and reseeding capabilities, both dryland and irrigated. Drs. Henry Janzen and Eric Bremer, dryland specialists, will discuss the influence of fallow frequency and tillage methods on crop productivity, and the effect of legumes on soil quality. Dr. Frank Larney will show his work on soil erosion and soil amendments. To join the tour and participate in carpooling from Sunburst, Mont., call Don Feist at the Shelby Soil Conservation Service office at (406) 434-5835.

14-15: "Who Will Farm the Land? Changes and Choices for Iowa Agriculture," Leopold Center for Sustainable Agriculture, Scheman Continuing Education Center, Ames, Iowa. Contact: Leopold Center, 126 Soil Tilth Building, Iowa State University, Ames, IA 50011-3120; (515) 294-3711; fax (515) 294-9696.

20-23: "Sustainable Land Management for the 21st Century," international workshop, Lethbridge, Alberta, Canada. Contact: Conference Services, University of Lethbridge, 4401 University Drive, Lethbridge, Alberta, Canada, T1L 3M4.

August

15-18: North American Agroforestry Conference, Iowa State University, Ames, IA 50011. Contact: Dr. Richard D. Schultz at (515) 294-7602.

26-31: Fellowship of Intentional Community '93, an international gathering on sustainable living, Evergreen State College, Olympia, Wash. Those in attendance will celebrate the diversity and vitality of the "intentional communities" movement and share knowledge of cooperative, sustainable lifestyles. Contact: Fellowship for Intentional Community, 8900 University Blvd., Evansville, IN 47712.

September

7-9: Third International Federation of Organic Agriculture Movements Trade Conference, Baltimore, Md. Topics include marketplace trends and equity and ethics in international trade agreements. Special events include tours of Washington, D.C., and a dinner sponsored every year by the Organic Foods Production Association of North America. Contacts: Katherine DiMatteo of OFPANA, (413) 774-7511 or fax (413) 774-6432; Steven Hoffman of New Hope Communications, (303) 939-8440 or fax (303-939-9559.

October

24-26: "Reshaping Agricultural Research and Education," a conference on science and sustainability. Red Lion Hotel, Bellevue, Wash. Sponsored by Washington State University and the western SARE program, the conference will focus on quantitative and qualitative methodologies for solving critical production, environmental and social problems associated with establishing and continuing sustainable agricultural systems. The program will feature innovative integrated research projects, non-traditional research and education methods, institutional strategies for increasing interdisciplinary research and a poster session. Contact: Norma Fuentes-Scott at (509) 335-2921. ❐

If you want to be on the Sustainable Farming Quarterly mailing list, or have your name removed from the list, please call Sherry at the Alternative Energy Resources Organization, (406) 443-7272 or write Sustainable Farming Quarterly, 25 S. Ewing, Suite 214, Helena, MT 59601. ❐

Resources

1992 Pacific Northwest On-farm Test Results. Stewart Wurst, on-farm testing coordinator at WSU, summarized the methods and results of 22 on-farm research tests conducted by farmers in the dryland Pacific Northwest in 1992. Test topics include planting systems and weed control, subsoil tillage, and soil fertility. All tests had randomized, replicated treatments, allowing the results to be statistically evaluated. For a copy, write Department of Crops and Soils, Washington State University, Pullman, WA 99164-6420.

On-farm Testing: A Grower's Guide, by B. Miller, E. Adams, P. Peterson and R. Karow. The principles of designing and conducting field-scale on-farms test are described, with emphasis on methods appropriate to dryland grain farms. Sample record sheets are included. To receive a copy of Bulletin EB1706, send $1 to Cooperative Extension Publications, Washington State University, Pullman, WA 99164-5912.

On-farm Composting Handbook, by Robert Rynk (ed.). This is thorough and easily understood reference on practical approaches to farm-scale composting of organic wastes, with ample diagrams and tables. For a copy of NRAES-54, send $15 to Northeast Agricultural Engineering Service, 152 Riley-Robb Hall, Cornell University, Ithaca, NY 14853-5701.

Farming Alternatives: A Guide to Evaluating the Feasibility of New Farm-based Enterprises, by N. Schack, W. Knoblauch, J. Green and M. Saylor. The guide is written for farm families interested in developing a new farm-based enterprise, especially alternative crops, food processing, direct marketing or farm tourism. For a copy of NRAES-32, send $8 to Northeast Agricultural Engineering Service, 152 Riley-Robb Hall, Cornell University, Ithaca, NY 14853-5701.

Issues in Sustainable Agriculture: What Are the Next Steps?, by Cheryl Miller. The report on a 1991 Symposium at the Michael Fields Agricultural Institute includes essays on environmental challenges, social sustainability, food safety and security, sustainable infrastructure, biotechnology, research and education, and "advancing the cause." Each essay is followed by questions designed to stimulate debate. Send $5 to MFAI, 2493 County Road ES, East Troy, WI 53220-9271, or call (414) 642-3303.

A Sustainable Agriculture Resource Guide for Oregon and Washington, by G. Bane, H. Murray and R. Dick. The Western Oregon/Washington Sustainable Agriculture Project has compiled a listing of readily available information to help growers and other users more quickly access sustainable agriculture books, periodicals and data bases on pest management, soils, water resource management and marketing. For a copy of Cooperative Extension Bulletin EM8531, send $9 to Oregon State University Administrative Services, Corvallis, OR 97331-2119. ❐

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