

the Practical Farmer

Practical Farmers of Iowa newsletter

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Summer, 1989

PFI/ISU STUDY OF SUSTAINABLE AGRICULTURE LAUNCHED

Last fall, PFI was contacted by the Northwest Area Foundation, of St. Paul, Minnesota. The organization feels there is a need for information about the economic

and social consequences of what is nowadays called "sustainable" agriculture. This is a subject that many PFI members have feelings about, but there isn't much hard data available. Is sustainable agriculture the salvation of the family farm, or is it a nail in the coffin of the rural business community? The foundation wants to inform this controversy with some facts.

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Representatives of PFI and sustainable agriculture groups from five other states attended meetings in St. Paul over the winter to formulate an approach. Also represented were the agricultural universities from those states. This, too, was in the design of the Northwest Area Foundation, which wanted to combine the technical expertise of the Land Grant institutions with the understanding represented in those grassroots farming organizations. The foundation said it wanted a study that really went out to farms, that had a strong socioeconomic emphasis, and that would distinguish farms as "sustainable, conventional, or in transition."

Gradually, a plan of action for Iowa emerged. We will divide farmers in the way the foundation intends, but along a number of different dimensions, or yardsticks. These dimensions include soil management, dependence on inputs, and diversity, among others. An initial survey will be sent to a cross section of farms as well as to farms associated with sustainable agriculture organizations. From the survey responses, about one hundred farms will be invited to participate in a detailed study.

The detailed study will include examination of the whole farming system as well as the individual enterprises. A team of agronomists will assess soil and

weed management on the farm. The investigation will also look at what businesses are patronized by the farm family, and where family members spend their time. The goal will be to discover what farming practices are in use, how effective they are, and what the consequences of these practices are for the farm and the rural economy. The entire study is scheduled to take three years.

PFI Participation

The PFI board of directors has been in touch with the project as it has developed. The Northwest Area Foundation intends that there be full "power sharing" between Practical Farmers and ISU. Board members Ron Rosmann and Dick Thompson and the PFI/Extension coordinator Rick Exner have been fully involved in the design of the study. Farmer input continues to be very important in decisions about the survey. Some of you will undoubtedly be asked to respond to this survey when it goes out this winter.

This study could affect PFI members in other ways as well. The organization has received a sustaining grant from the foundation for activities in support of the overall project. You will be hearing about these activities as the projects develop.

FIELD DAYS IN FULL SWING

There are a total of 9 field days this summer, involving 22 cooperators in all. These PFI members are demonstrating methods of weed control, fertilizer placement and rates, manure handling, cover cropping and other practices.

Again this year, our publicity has been coordinated by Maria Rosmann, who farms with her husband Ron near Harlan. Maria has generously put her journalism degree to work for us, writing and targeting press releases for each field day. It was also Maria's idea to produce the attractive brochure of 1989 field days that members received.

Of course, there's no substitute for local effort. Many cooperators have also taken the time for personal follow-up with nearby newspaper reporters and broadcasters.

What is the 9th Field Day?

The last field day was accidentally left off the listing in the spring newsletter! This one is the tour of the farm of Tom and Marcia Hanks, near Ackworth. It's scheduled for Sept. 14, at 5:00 P.M. Tom is a ridge tiller (he sells Buffalo equipment), and the corn-bean operation is one of the larger ones farmed by a PFI cooperator.

Like most other cooperators, Hanks used the late spring soil nitrate test this year, and he based the low rate in his N fertilizer trial on the test.

The second PFI trial on the farm is a unique one. Pioneer H-Bred microbiologist Dr. Susan Brown has established a field comparison of chemical and biological controls for phytophthera in soybeans. Compared to no-treatment are both the popular chemical control Ridemil™ and an experimental bacterial seed treatment. This is the first time the bacterial inoculant has been tested in a farmer's field, and PFI is pleased to be part of the project.



Cooperator Tom Hanks wades into the phytophthera trial.

Tom knows from experience that there is a potential for phytophthera in this field. This was not a terribly bad year for the disease, but the Pioneer researchers could see some differences in soybean stand in the plots. Sue Brown will be on hand for the field day to explain the final results.

To reach the Hanks' demonstration, take Hwy. 92 for

6 miles east of Indianola. then go approximately 1 1/2 miles north on S-23. The fields are on the east side of the road. Look for the PFI sign.

LEOPOLD CENTER TO HOST CONFERENCE

The Leopold Center for Sustainable Agriculture has announced a conference: *New Developments in Cropping Systems and Livestock Management Systems*. The meeting will take place Feb. 6-7, in Ames. The event is the successor to the Biofarming conferences, which were held in alternate years, beginning in 1983. Objectives of the conference are to:

- Provide an informational bridge among conservationists, extension personnel, researchers, and practitioners of sustainable agriculture in the midwest;
- Present progress reports of Leopold Center sponsored research; and
- Provide a forum for researchers and practitioners to identify research priorities in sustainable agriculture in the midwest.

Planning for the conference started last winter, with several PFI members participating in the process. The program will feature a number of Iowa State researchers, including soil scientist Rick Cruse, Mark Honeyman, who coordinates the outlying research stations, and economist Mike Duffy. Chuck Francis, of the University of Nebraska Extension, will deliver the keynote address, and Ron Morrow, of the University of Missouri, will discuss livestock management systems. Morrow is an expert in controlled grazing and low investment livestock operations. At the banquet to be held the evening of the first day, Nina Leopold Bradley, daughter of Aldo Leopold, and Charles Benbrook, of the National Research Council, will offer their perspectives on Leopold's philosophy and its significance for agriculture.

Several farmers are also on the program, including Dick Thompson, of Boone, and Ralph Neill, of Corning. Workshops on both days of the conference will give opportunities for the kind of informal information exchange that often turns out to be the most valuable part of these affairs.

Registration for the conference is \$10 for one day or \$15 for the two days. Meals are extra and optional.

Food costs and other information may be obtained by contacting the Leopold Center for Sustainable Agriculture, 3203 Agronomy Hall, Iowa State University, Ames, Iowa 50011.

NOTES AND NOTICES

Fall Is Membership Renewal Time

September will complete another year for members of Practical Farmers of Iowa. You will soon be invited to continue your support of PFI. It has been a busy year for the organization. An on-farm trials coordinator was hired; the Northwest Area Foundation selected PFI as the Iowa organization to lead its study of sustainable agriculture; and cooperators conducted more trials and field days than ever before.

Practical Farmers continues to grow and evolve. Board members have been thinking about ways to offer more opportunities to the general membership and to Iowa farmers who are not members. You will be hearing about these plans in the membership renewal mailing and in future newsletters. But you might want to get out your checkbook now, while you're thinking of it. Send your \$10 renewal to:

Practical Farmers of Iowa
RR 2, Box 132, Boone, Iowa 50036.

A New Newsletter: "The SERA Network Rap"

SERA stands for "Students Empowered for Rural Action." Their newsletter is "designed specifically for young people involved or interested in the current farm situation." The attractive May issue was mailed with assistance from the Student Senate Rural Crisis Committee of the University of Iowa. It contains an article on young people who are "bucking the trend" by remaining on the farm as well as a report of the Third National Student Farm Action Conference, which was held in Ames last January. Judging from the report of this meeting, rural youth and other concerned young people are aware of the need for "sustainable methods of farming that work harmoniously with the environment."

It is heartening to find kids who are working to make

things better. If you'd like to support this effort, you can subscribe to the newsletter for \$10 (\$5 if you're under 25 years old). Contact:

The SERA Network Rap
550 11th St., Des Moines, Ia. 50309

Iowa Organic Growers Organize

(The following article appeared in the May/June issue of *Certified Organic*, a newsletter published by the Minnesota Organic Growers and Buyers Association.)

Sixty organic growers and marketers from around the state of Iowa met April 2, in Cedar Rapids, Iowa, and officially formed the Iowa Organic Growers and Buyers Association.

Yvonne Buckley, OGBA executive director, helped facilitate the meeting.

The IOGBA arrived at several functions for the organization: to act as a clearinghouse for certification information and requests; provide marketing information to growers and buyers; identify markets, buyers and end-users for organic products; educate consumers; work with college and university research units and extension services across the state; work with the state of Iowa on appropriate legislative issues; and endorse and support national standards for organics.

For additional information contact: Allan Blair, 614 North Clay St., West Liberty, Ia. 52776.

Farm Bureau Sponsors Innovation Competition

The Farm Bureau has announced the Farmer Idea Exchange, a contest to recognize inventions and good ideas that increase farming efficiency or production. The competition is open to FB members and includes eight divisions: livestock, marketing, pollution control, integrated pest management, farm systems, crops, energy, and equipment. There will be state and national winners in each category. Entries were due by Sept. 1, though, so you have already missed this round of the program.

RESTORATION STUDY SITES SOUGHT

A group of researchers at ISU is searching for farmers who are planning to restore wetland, prairie, or forest vegetation on their land for CRP or some other project. The Research Unit in Landscape Ecology is conducting the search as part of a study in association with the Leopold Center for Sustainable Agriculture. The scientists involved want to study sites where natural vegetation has been restored to see how these sites function in the landscape.

Natural vegetation (prairie, wetland, and forest), when located in appropriate places in the landscape, can intercept, store, and process agricultural contaminants in surface and subsurface runoff. There is increasing evidence that natural vegetation, particularly wetland vegetation, can significantly improve water quality and simultaneously create new wildlife habitat and recreational areas in agricultural watersheds.

If you are interested or would like additional information, please contact Dr. Beth Middleton (515-294-4033) at the Research Unit for Landscape Ecology, 139 Bessey Hall, Iowa State University, Ames, Iowa 50011. Beth has already been to the farm of Ron and Maria Rosmann, near Harlan, where she was able to recommend some shrub species (for a waterway) that won't interfere with tile lines.

PAPER VALIDATES ON-FARM RESEARCH

The most recent edition of the *American Journal of Alternative Agriculture* features a paper by University of Nebraska agronomist Phil Rzewnicki, PFI director Richard Thompson, and five others. "On-Farm Experiment Designs and Implications for Locating Research Sites" reviews on-farm research conducted by PFI cooperators in 1987 and by Nebraska agronomists over a number of years.

The article dispels the myth that on-farm research cannot yield reliable results. The authors have evaluated trials for their statistical precision, using the "coefficient of variability," or "C.V." of each experiment. A low experimental C.V. means real treatment effects can more easily be distinguished from the "background

noise" caused by soil variations across the field.

Standard, small plot, experiment station trials under irrigation in Nebraska gave C.V.s in the range of 8% to 15% for corn yields and 6% to 12% for soybean yields. The paper reports on a variety of large-plot yield trials that fell within these ranges. The PFI on-farm trials had the lowest C.V.s of all. These 23 experiments in corn and soybeans gave an average C.V. of 2.6%, with 5.0% being the highest. The PFI trials had a 79% to 99% probability of detecting a yield difference of 10%, according to the authors.

Unlike some experiment station trials, PFI trials use a very modest design. Usually only two practices, or "treatments" are compared per experiment. These treatment pairs run side-by-side across the field, and the pairs are repeated, in random order, at least another five times. The PFI field trials are "farmable," yet they yield results that can be evaluated with a standard statistical "yardstick." This experimental design is the key that can make trial results meaningful -- if they are correctly interpreted -- to people who have never seen the field itself.

SUSTAINABLE AGRICULTURE BUS TOUR OFFERED IN EXTENSION THIS FALL

The Extension Service in Iowa is moving to incorporate concepts of agricultural sustainability into its regular programs. County and area agriculturalists and natural resources staff have been invited to participate in an in-service orientation on sustainable agriculture, October 4-5. The two day bus excursion will stop at the Thompson farm (Boone), the Rosmann farm (Harlan), the farm of Jim Bender, in Weeping Water, Nebraska, and a Leopold Center project at the DeSoto Bend Wildlife Area.

The tour should help interested extension personnel to become more familiar with sustainable agriculture. The visits to working farms will provide concrete examples, and state extension staff will be on hand to lead discussion. PFI members might encourage their own local extension agents to consider making the trip.

OFF-CAMPUS TELECOURSE IN SUSTAINABLE AGRICULTURE

This winter, ISU will present a 12-week course in sustainable agriculture, with support from the Leopold Center. The 2-credit course will be beamed by satellite to county extension offices. The broadcasts will be on Wednesdays, from 7:00 to 9:00 P.M. Tuition for the course is \$154 for undergraduate credit and \$242 for graduate credit. Videotapes of the 12 sessions can also be rented or purchased.

Topics and dates for discussions are:

- Nov. 8 The Notion of a Sustainable Agriculture
- Nov. 15 Appropriate Tillage Systems
- Nov. 22 Resource Conservation
- Nov. 29 Fertilizers and Groundwater
- Dec. 6 Pesticides and Biotechnology
- Dec. 13 Governmental Policy Concerns
- Dec. 20 Farming Systems
- Jan. 10 Agricultural Economics
- Jan. 17 Agroecology
- Jan. 24 Public Health Concerns
- Jan. 31 Food Security Issues
- Feb. 7 Progressing Toward a Sustainable Agriculture

The professor in charge of the course is Ricardo Salvador. He has chosen for a textbook "Agroecology: The Scientific Basis of Alternative Agriculture," by Miguel Altieri. Dr. Altieri, himself, will give a presentation on-camera, as will a number of other recognized authorities. Each class will include time for students to phone in questions and comments.

The preregistration/prepayment deadline is Sept. 25. Contact: Harold Crawford, Asst. Dean, 117 Curtiss Hall, ISU, Ames, Ia. 50011.

BIOTECHNOLOGY AND SUSTAINABLE AGRICULTURE CONFERENCE HELD

A conference entitled *Biotechnology and Sustainable Agriculture: Policy Alternatives* took place May 22-24, in Ames. The event was sponsored by an organization called the National Agricultural Biotechnology Council, with support from the Joyce Foundation and the USDA.

The conference was designed to confront some of the "big questions" about the direction of agriculture. A

wide variety of speakers were represented, all the way from Monsanto to the Humane Society. The diversity was a plus, although some speakers slipped into "soap boxing" or discredited their positions by revealing basic ignorance about agriculture or sustainable agriculture.

One of the two keynote addresses was given by Charles Hassebrook, of the Nebraska-based Center for Rural Affairs. His point was that, because of its far-reaching consequences, agricultural research is really a form of social planning. As such there should be a set of research goals and a priority-setting process to ensure that agricultural technology is *socially* sustainable. Hassebrook suggested four such goals: create opportunities for owner-operators; enhance human health; preserve the environment; and promote economically viable farming.

"Biotech" *can* help realize these goals, said Hassebrook, but it is presently promoting an industrial model of agriculture characterized by fewer, larger farms, less diverse cropping systems, and increased specialization. These trends reduce the role of management (and people) in agriculture. In providing the means to "over ride" natural systems, biotechnology is being used in the same way that farm chemicals have been, he said.

Hassebrook provided examples of areas in which he believes biotechnology can make a contribution to agricultural sustainability. He suggested that biotechnology address a diverse set of crops, including both the development of new alternative crops (for example, low-lignin grass) and new uses for present crops like oats and alfalfa. He also urged an emphasis on low-investment livestock operations and on those diseases and parasites that cannot be controlled by cultural methods.

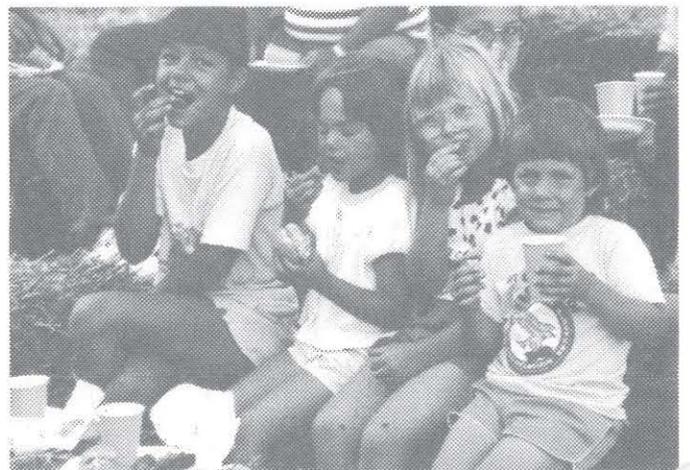
The second keynote speaker was Robert Goodman, of the biotechnology corporation Calgene. He provided the audience with a knowledgeable description of the principles of sustainable agriculture, but he seemed to question whether it could be "productive." He also offered the opinion that the calculations necessary to farm more sustainably in the short term will not be made by *either* family or industrial farmers unless there is a "legislative environment" that encourages them to do so.



Why is this man smiling?



Michigan extension agents visit a PFI farm.



Picnic at the Hartsocks' field day.



"Zebra strips" on ridges at the Frantzen farm.



The action at the Hay Expo was in the field.



Iowa Forage and Grassland Council table.

In his final statement, Goodman voiced the perhaps-obligatory statement that available technology must be adopted without consideration of who will benefit from it. Discussion over the next days of the conference concerned just who will and who likely will not benefit from specific biotechnologies. Two of the major topics were animal growth promotants and herbicide resistant crops.

Animal Growth Promotants

Biotechnology has allowed natural growth hormones from cattle and pigs to be mass produced by bacteria. Injected into the livestock, these protein-based hormones produce what some describe as "super animals." Milk production per cow may increase 25%, and weight gain by pigs by 10-15%.

Robert Kalter, an ag economist at Cornell University, said he projects that bovine growth hormone will result in a decrease in dairy cow numbers from the present 11 million to 8-9 million. The hormone will require a higher level of management and capital investment, he said, and the early innovators will be the ones who profit from the new technology. A Cornell study predicted loss of up to 1,000 dairies in New York State due to the hormone.

Although greater feed efficiency with the hormone is claimed, the ration must be enriched with grain; consequently the operation becomes more dependent on these row crops. Thus far, bovine growth hormone has been tested only under top management conditions. It remains to be seen what are the long-term health effects for cows under average management.

Porcine somatotropin (PST) reportedly increases feed conversion efficiency in pigs by 30%. The hormone presently requires daily intramuscular injection, and there is a fairly narrow dose range between no effect and toxicity. There is a tendency for increased joint disease, but it can be minimized by diet. Use of the hormone has been associated with increased amounts of "pale, soft, exudative" meat, which is considered lower quality. PST results in decreased back fat and increased heat production. As a result, the pigs' environmental range is narrowed about 10 degrees Fahrenheit at both the hot and cold ends. Hogs are also reported to be more hyperactive and excitable on the hormone.

Marvin Hayenga, of the ISU Economics Department, forecasted that PST will result in lower corn prices due to decreased demand. He also suggested there may be a further shift to large producers as a result of the technology.

Herbicide Resistant Crops

Biotechnology companies are developing crop varieties that are resistant to herbicides which ordinarily would be lethal to that crop. Rebecca Goldberg, of the Environmental Defense Fund, estimated that the market for seed of resistant varieties could reach \$6 billion per year by the end of the century.

Homer LeBaron, who works for CIBA-GEIGY and is president of the Weed Science Society of America, pointed out that herbicide resistance is already common in weeds and is becoming a serious problem. Plants such as ryegrass in Australia are even multiply-resistant, since they can oxidize many foreign chemicals. LeBaron's solution is "product stewardship," which means responsible promotion and use of herbicides. Farmers must not depend too exclusively on herbicides, should limit rates, and should use a variety of products rather than just one. Resistance is nature's response to overuse, he said. If herbicide resistant crops just allow more herbicide use, weeds will simply develop resistance that much faster.

Although there have recently been field tests of crop plants resistant to Lexone, Sencor, or atrazine, most of the work has utilized newer herbicides such as glyphosate, bromoxynil, and the sulfonyleureas. An interesting point was brought out in the discussion: the representatives of chemical companies fully expect that herbicide weed control will cost farmers more in the future than it does now. If the older generation herbicides are not reregistered with the EPA, it will make it easier for industry to charge more for the new products.

Economist Loren Tauer discussed the possible consequences of herbicide resistant corn in the U.S. He has used an econometric model to predict the effects this technology would have on agriculture. According to Tauer, corn acres would first increase and then would decrease (except in the Mississippi delta and Appalachia, where weed pressure is greater). While the technology would be "individually profitable," he said, the overall effect on farm income would be negative due to a 2-

4% increase in production. Corn prices would be lowered by about 30 cents per bushel.

Although feelings sometimes ran high at the conference, the important thing is that valuable information was presented for consideration. A common information base helps in discussion of the issues, unlikely as it may be that wide agreement ever will be reached. The organizers of the event deserve credit for bringing together people with such a variety of viewpoints.

THE VALUE OF DIVERSITY IN AGRICULTURE

-- Ronald Rosmann

While cleaning the farrowing house one recent morning, I realized how thankful I was that I didn't have to work in or manage a hog facility for the rest of the day, or every day of the week, for that matter. I was glad to get out of there and get on to the next task, which that particular day was combining oats, baling straw, grinding feed, changing the oil in the tractors, and taking care of the many incidental chores which come up.

There has been some discussion lately as to the value of diversity as a determinant of sustainability in agriculture. Some feel it is a major determinant, while others believe it does not necessarily have to be. I contend that diversity is *extremely* important for a healthy farm and a healthy society.

All other things being relatively equal, I would not consider a cash grain (corn and soybean) farmer to be as sustainable as a multi-grain farmer who has livestock (e.g. corn, oats, soybeans, hay and/or pasture, along with cattle, sheep, hogs, etc.). Diversity on a farm can be thought of in terms of a variety of considerations, three of which I will explore briefly:

- 1) *Genetic diversity*
 - A) *different crops and livestock*
 - B) *different species and varieties within the crops and livestock*
 - C) *different locations for crops (crop rotations)*
- 2) *Economic diversity*
- 3) *Educational diversity*

Genetic Diversity

A farm that grows various crops and livestock with different varieties and species contributes more to genetic diversity than does a monoculture farm. A monoculture crop situation is generally more vulnerable to pests, disease, and climatic changes. The Irish potato farmers of the 1800's provide an example. Between 1845 and 1850, one million people died as the potato blight destroyed their main source of food. The corn leaf blight that destroyed one-fifth of the corn crop in the United States in 1970 is another example of what can happen from too exclusively relying on monoculture crops.

Even on a farm that grows various crops, most of the varieties for a particular crop now come from only one or a few crossbred strains. Still, genetic diversity and genetic selection can be enhanced on a multi-grain and livestock farm.

Diversified farms employ various forms of crop rotations, such as a traditional 5-year rotation of soybeans, corn, oats, alfalfa and corn. Imagine the scores of different micro-organisms each year on each field. Different kinds of soils and slopes should contribute to diversity. Steeper, poorer ground should be planted to permanent grass, while flat, bottom ground is more suitable to row crops. That should be obvious, but in this day and age of government programs and economic realities, such is not always the case.

By growing different crops, weed and pest cycles are often interrupted. Take, for example, corn rootworms in continuous corn. By simply rotating with another crop, most of the problem is eliminated, except in the cases where the insect can now survive through two winters. That development can be traced to the tremendous selection pressure for extended diapause that corn-bean agriculture has placed on the rootworm.

By rotating small grains and alfalfa or pasture, etc., those weeds which thrive in row crop production are *not* selected. Some examples are velvetleaf, foxtail, pigweed, and shattercane -- all weeds which seem to thrive in continuous row crops.

Farms that use high amounts of pesticides negatively affect genetic diversity. All too often pesticides kill the beneficial and benign species of plant and insect along

with the bad. Natural predation is lessened. As time has gone on, weeds and insects genetically tolerant to pesticides have been selected. So new or more powerful pesticides are developed.

The astounding thing is that there are more crop losses to pests now than before the heavy use of pesticides. For example, the Environmental Protection Agency has estimated that in 1945, U.S. farmers used 50 million pounds of pesticides and lost 7% of their crop to insects before harvest. In 1975, U.S. farmers used 12 times more pesticides but lost twice as much (14%) of their crops to insects before harvest.

One of the best examples of genetic diversity must be the native prairie. A prairie may contain over 200 species of plants, all in balance with one another. I am not advocating that our cropland be allowed to revert back to prairie, but I suspect that at least some of the secrets to our survival lie in the vast genetic diversity and balance of the prairie ecosystem.

Economic Diversity

A farm with various enterprises does not have to "put all its eggs in one basket," as the saying goes. By having various crops and livestock, economic risks should be diminished, at least statistically speaking. One of the problems here is the role which government farm policies play in the economics of diversity. In Iowa, we are all too aware that it is corn which the farmer is encouraged -- even forced -- to grow, because the size of the corn base is a determinant of program subsidies. Historically, it has been in the farmer's interest to grow as many bushels of corn as possible, which in most cases has required large amounts of fertilizers and pesticides.

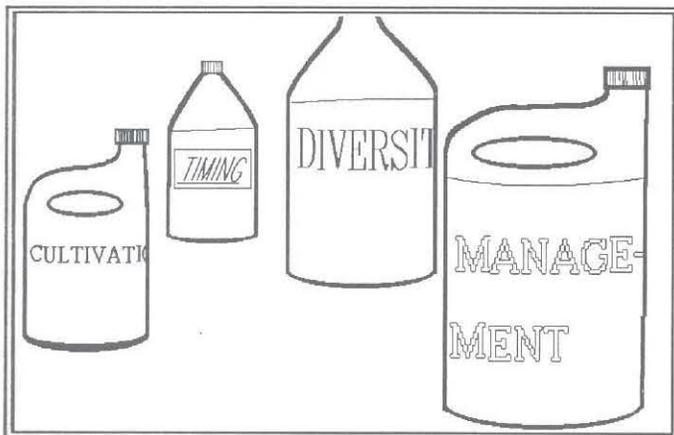
While the average size of farms keeps increasing, the number of Iowa farms with livestock keeps decreasing. In just five years, from 1982-1987, 21% fewer farms had hogs, 21.5% farms had beef cows, and 35.8% fewer farms had chickens. Corporate control of the entire livestock industry -- which could be thought of as a monoculture because of its negative impact on diversity -- has been steadily increasing.

The diminished social diversity -- exemplified in the dwindling number of farms, the increasing size of farms, and the aging farmer population -- has also been felt in

rural communities. The exodus of youth could be slowed with greater economic diversity. For example, value-added industries that process our raw food stuffs generate local incomes. These industries have an unrecognized wealth of underutilized raw materials such as canola, buckwheat, fruits, vegetables and wood.

Educational Diversity

Traditionally, the farmer has been thought of as "a jack of all trades, master of none." That's what I consider myself. Although farmers still have to be knowledgeable in many different areas, I see that knowledge base diminishing in some critical areas as the profession has become more technical and specialized. Farmers have become good technicians. I fear, though, that many farmers have somehow lost, or have never acquired in the first place, the core understanding of their soil and of how and why things grow and happen the way they do.



A product line for sustainable agriculture.

We could all afford to learn more about the microbial life of the soil and the relationships between light, air, water, and minerals. We need to understand more about weeds. Attempting to get rid of all weeds shows a pathetic arrogance and ignorance -- as if man could control all of nature. New and more perplexing weeds tell us otherwise -- that natural selection (or unnatural selection) determines the future weed situation in our fields.

The need for diversity is evident beyond agricultural education. Our educational system as a whole may have become too specialized and technical in some

ways. The reports say that our children are lagging behind in the basic understanding of economics, mathematics, English, geography, ecology, and other physical and biological sciences. These are all ingredients of a classical liberal education. I know that at college I had to go beyond the strictly agricultural courses -- to botany, plant ecology, physiology, zoology, etc. -- to really get a grasp of the principles of plant and animal growth and their relationship to our environment.

There are likely limits to the degree of diversity which can take place on a farm. It also remains to be seen whether appropriate types, sizes, and prices of technology will be available so that farmers can utilize more diversity on their farms in the future.

We all come from different families, backgrounds, faiths, beliefs and attitudes. That is the beauty of human diversity. Diversity requires us to be more tolerant of each other and opens doors to personal and creative development. There must, however, be some fundamental consensus on how we fit in the environment if it is to sustain us in the future.

FROM THE COORDINATOR'S DESK

-- Rick Exner

This summer Dick Thompson and I have been driving around the state visiting cooperators. (That's my excuse for getting this newsletter out late.) Things generally look more cheerful than they did in last summer's drought. Here's a very brief rundown of what we've been seeing.

Nitrogen

The late spring soil nitrate test has been put to good use. Cooperator Tom Frantzen figures that he saved around \$2,500 on nitrogen fertilizer by using the test. Some other cooperators who used the test found that they had to apply pretty much the full rate of N. A number of second-year corn fields required little or no nitrogen fertilizer according to the test, while corn-after-beans often needed more than the usual amount. These outcomes were likely caused by last year's drought, which reduced soybean growth and increased soil nitrogen carryover. Without the nitrogen test, we wouldn't have known for certain how these conditions

affected the nitrogen fertilizer requirements of the 1989 corn crop.

Potassium

Did you have corn in May and June that was kind of ragged and uneven, with the edges of the lower leaves yellow or brown? These potassium deficiency symptoms were evident on more than half a dozen cooperators' farms. Still more farms are seeing low K levels in tissue samples. The relatively high levels of calcium and magnesium that exist in many Iowa soils can make it difficult for crops to take up potassium. Minimum tillage can add to the problem, because untilled soil is cooler in spring and less aerated, and because the potassium that leaches out of crop residue remains on the surface of the soil. Add to this a dry spring, when roots can't get to the potassium and potassium can't diffuse to the roots.

Additional potassium fertilizer is indicated for those fields showing deficiencies. What is the best way to apply it? There is research which indicates that, particularly for minimum tillage like no-till and ridge-till, P and K fertilizers are most efficiently used when applied in a band. It remains an open question whether deep placement of the band is better than placement at seed level.

Weed Control

A number of cooperators compared chemical and mechanical weed control systems this year. Several others who started out to do so eventually opted for a broadleaf postemergence herbicide treatment. In other trials it was the herbicide treatment that ran into trouble, due to heavy spring rains.

Cover Crops

Several fields were set back due to early moisture competition or nitrogen tie-up from cover crops. Later rains have evened out these differences in some cases. Cooperators have gained new respect for rye's ability to compete! The shoulder of the ridge has again proven to be the difficult area to clear of cover crops.

Oats

This was a good year for oats and a great year for

straw. At least two cooperators reported yields of 130 bushels per acre or better. Cooperators Frantzen and Reicherts also obtained good oat yields on permanent ridges this year. Several PFI cooperators are keeping records for the oats economic challenge program of the American Oat Association.

Membership Application and Renewal Form

Name _____

Organization or Affiliation

Address _____

City _____

County _____

State _____

Phone number(s)

()- _____

This is a new membership
 renewal

Do you derive a significant part of your income from farming?

Yes No

Suggested by (name of person)

Please enclose check or money order for \$10.00 payable to "Practical Farmers of Iowa" and mail to:

Practical Farmers of Iowa
RR 2, Box 132
Boone, Iowa 50036

CORRESPONDENCE

Correspondence to the PFI directors' addresses is always welcome. Member contributions to *the Practical Farmer* are also welcome and will be reviewed by the PFI board of directors.

District 1 (Northwest): Bob Graaf, RR 1, Palmer, 50571. (712)-359-7787.

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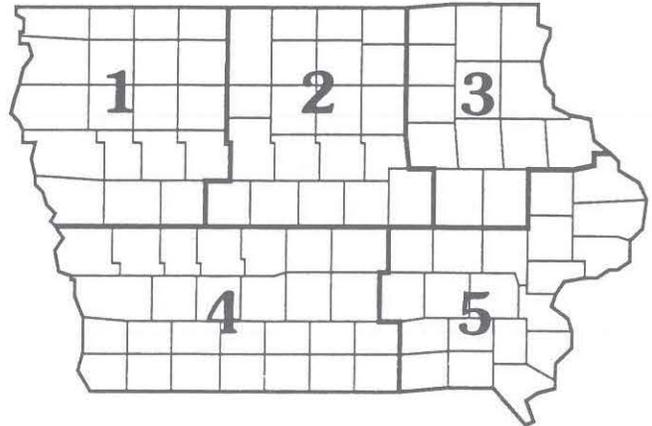
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PRACTICAL FARMERS OF IOWA
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Address Correction Requested