the Practical Farmer

Practical Farmers of Iowa Newsletter

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Fall 1991

PFI EDUCATION COORDINATOR HIRED

On October 7th Gary Huber of Ames began work as the Extension/ Practical Farmers of Iowa education coordinator. Gary's hiring followed approval last spring of a PFI proposal invited by the Educational Foundation of America Board of Directors. PFI then subcontracted with ISU Extension to hire a person to carry out the education program outlined in the grant proposal. Huber is this person.

The education program is described on page six of this newsletter. Here we want to introduce you to Gary. Gary graduated from Turkey Valley High School in 1971, and until 1980 he farmed 160 acres near Protivin in Chickasaw County. The operation included 35 head of stock cows, a 55-sow farrow-to-finish hog set up, and a crop rotation that included oats, hay, pasture, and corn.

Gary Huber is the new education coordinator.

In 1980, mostly because of concerns about what was happening to agriculture in Iowa during the 1970s, Gary made the change from farmer to student. He received a BS from Iowa State in 1985, with a double major in Agronomy and Public Service and Administration, and a Master's degree in rural sociology in

(Continued on page 2.)

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1987. His Master's thesis examined whether there are differences between small and large farms in the locations used for goods and services. During this time he worked as an hourly for both Dr. Alfred Blackmer and Dr. Richard Cruse.

In 1987 Gary began work as a water quality specialist for the Iowa Natural Heritage Foundation. He worked a year out of an office in Humboldt helping drainage well owners in north central Iowa look at options for controlling groundwater contamination. He worked another year out of an office in Postville on a similar project, this time with sinkholes. He has also been involved with water quality projects in Winneshiek, Floyd, Dickinson and Palo Alto counties, and in a ten-county area of southern Iowa where surface reservoirs are used for drinking water.

Gary's experiences, skills, and commitment to rural Iowa will help PFI share information about profitable, environmentally sound farming. Welcome, Gary!

DEC. 9 PFI ANNUAL MEETING -- "SMORGASBORD"

Get ready for something different at the annual winter meeting of Practical Farmers of Iowa. The meeting, Monday, December 9, in Ames, will include a featured speaker, displays, entertainment, and a variety of workshops. The simultaneous workshops will allow you to focus in on the topics you find most interesting, with plenty of interaction for your questions and comments. The event will take place in the Starlite Village Best Western, just off the 13th Street exit of I-35. The program begins at 8:30. The meeting is free to current PFI members. (The noon buffet is an additional $7.) Nonmembers pay the cost of membership, $10.

Featured Speaker Bill Heffernan

Bill Heffernan, who was raised on a farm near Tripoli, is now the chairman of the Department of Sociology in the University of Missouri-Columbia. The *Missouri Ruralist* magazine named Bill and his wife Judy Man and Woman of the Year in Missouri Agriculture for 1987. They are also recipients of the Victor I, Howrey Memorial Award by the National Association for Rural Mental Health for their efforts in furthering rural mental health.

Rural sociologist Bill Heffernan is the featured speaker at the PFI winter meeting in Ames.

Heffernan teaches a course designated: "Ownership and Control of U.S. Agriculture," and he has written over 100 papers, articles, and book chapters on the changing nature of agriculture and the food system. He is also a supporter of sustainable agriculture in Missouri and a member of PFI. His talk for the PFI winter meeting is entitled: *The Changing World Food System - What It Means for Sustainable Agriculture.*

Achievement Award

For the past two years, Practical Farmers of Iowa has presented the Sustainable Agriculture Achievement Award to someone who has advanced the development of sustainable agriculture. The previous recipients are ISU agronomy professor Alfred Blackmer and former ISU Agronomy Department head John Pesek.

At the December meeting, the Award will be presented to Jerald (Jerry) DeWitt, director of agriculture for the Iowa Cooperative Extension Service. Dr. DeWitt serves on the board of the Leopold Center for Sustainable Agriculture and is board president of the Institute for Alternative Agriculture. His activities in Iowa have

Jerald R. "Jerry" DeWitt to receive the Practical Farmers of Iowa Sustainable Agriculture Acheivement Award.

THOUGHTS FROM LAST WINTER'S MEETING

I like to hear the questions asked.

It's good to see what the cooperators are actually doing.

It's a good opportunity to visit with other people.

What I got most from the winter meeting was the spirit and reaffirmation that research and knowledge can and does come from a grassroots approach.

The exchange of ideas, thoughts, and information with other farmers was the key benefit for me.

The information presented at the meeting isn't available elsewhere.

done much to bring farmers and researchers together to work for profitable, environmentally sound farming.

Chief Seattle's Challenge

At the end of the day, just before the business meeting, Bill Dahl, a native of Orion, Illinois, will recreate the famous 1854 address of Chief Seattle. What does this have to do with sustainable agriculture? Chief Seattle, whose name was given to the capital of Washington State, was a great Native American orator. At a council held to sign treaties with the United States Government, the chief described the differences between his culture's relationship to the environment and that of the ascendant European culture. The words attributed to him more than a century later seem today to be prophetic.

Workshops

Past PFI annual meetings have featured the results of the year's on-farm trials. The trials will also be reported this day, but in a workshop format that will allow a broader range of presentations. Here is the list of workshop subjects:

Homestead Pride Poultry Co-op: *Karen Varley and Pete Brent.* This cooperative was established to provide an additional source of on-farm income. Two organizers will explain how it works and what it offers farmers and consumers. (Workshop session 2.)

Women in Agriculture: *Rita Mays, Marj Stonecypher, and others.* This will be an open discussion by and for women to contribute what they are doing and how they integrate home, work and entertainment on the farm. Bring your ideas and interests and something from your scrapbook to share. (Session 1.)

Intensive Rotational Grazing: *Tom Curl, John Cowles.* These are producers experienced with rotational grazing. They will describe what they're still learning and their goals for the future.

Mentoring Sustainable Agriculture: *Gary Huber, Extension/PFI Education Coordinator.* PFI members have an opportunity to make a unique and personal contribution to the future of Iowa agriculture by sharing their knowledge with young people. (See article on page 7.) Gary Huber will lead a discussion of this mentoring program and how PFI members can make a difference.

Weed Management: *PFI Cooperators.* Cooperators this year conducted a variety of replicated trials comparing types of mechanical, cultural, and chemical weed controls. They will share the results of these trials.

Nitrogen and Manure: *PFI Cooperators, Dr. Antonio Mallarino, Alan Britten.* In 1991, cooperators worked with the late spring soil nitrate test, an experimental early spring test, and the late season stalk test in cooperation with ISU researchers, including Mallarino. Manure trials were conducted in cooperation with the Big Spring Basin Demonstration Project and the Benton/Buchanan County Manure Project (coordinated by Alan Britten). Cooperators will report.

Starters, Inoculants, Potassium, and Phosphorus: *PFI cooperators.* Did starter fertilizers pay in 1991? Did ridge-tillers get potassium into the crop? Cooperators who conducted trials will report.

Narrow Strip Intercropping: *Dr. Rick Cruse, PFI Cooperators.* Farmers working with Cruse learned some important things about this new practice in 1991. Can this technology increase both yields and conservation? The state of the art will be discussed.

Low-Investment Livestock Systems: *Dr. Mark Honeyman and PFI Cooperators.* Honeyman, who directs outlying experimental farms for ISU, has spoken and published widely about the merits of low-budget livestock operations. He and PFI farmers will present ideas and invite comment.

Cover Crops and Small Grains: *Dr. Tom Kaspar, Richard Thompson.* Tom Kaspar would like to form a farmer advisory group of people interested in cover crops. He will describe his research with cover crops and solicit input from those present. (See the sidebar to the right.) Dick Thompson has conducted many trials with cover crops, including several this year that used cover crops for weed control.

OATS COVER PROJECT SEEKS INPUT

PFI members Ron Vos at Dordt College, Don Davidson, and Dean Vantiger have been cooperating with researchers at ISU and the National Soil Tilth Lab on a cover crop study that is being supported by the Leopold Center for Sustainable Agriculture. They are trying to see if spring oats planted in late summer or fall will produce enough growth before winter-kill to protect the soil from erosion after soybean harvest. Because oats will not survive through the winter, no herbicides or tillage will be needed to control the cover crop in the spring. So far, the best results have come from broadcasting oat seed directly into the standing soybean crop in mid-August (see picture). Broadcasting either immediately before harvest, after harvest, or drilling after harvest has not been very successful.

At this point, the researchers would like to meet with anyone interested in this project at a workshop to be held at PFI's winter annual meeting. If you have ever tried spring oats as a cover crop, have some ideas to share, or would like to hear more, then please attend. Maybe they can even convince you to try an oat cover crop on your farm next fall!

This oats cover, seeded by Tilth Lab researchers before leaf yellow of soybeans, had created good ground cover by the time the ground froze. Hear more at the winter meeting.

DECEMBER 9 MEETING SCHEDULE

8:00 to 8:30 am Registration. (Come early and see the displays.)

8:30 Welcome and Introductions: Tom Frantzen, PFI president.

8:45 Bill Heffernan, *The Changing World Food System -- What It Means for Sustainable Agriculture.*

9:30 Sustainable Agriculture Achievement Award presentation -- Richard Thompson.

9:45 Refreshment Break.

10:00 Workshop Session 1.

11:00 Workshop Session 2.

12:00 Noon Buffet.

1:30 Workshop Session 3.

2:30 Workshop Session 4.

3:30 Refreshment Break.

3:45 Chief Seattle.

4:15 PFI Business Meeting (everyone welcome).

Economics -- Does It Pencil Out?: *Don Davidson, Dick Thompson, and John Creswell, Extension Crop Production Specialist.* Dick will present some economic comparisons between different cropping systems, Don Davidson will discuss alternative methods to calculate production costs, and John Creswell will describe the Enterprise Record Keeping system used by Extension.

In addition, there will be displays and posters to visit in the hall of the Starlite. And don't forget the business meeting at the end of the day. The north-central and southeast districts will elect new board representatives, as the second terms of both Dick Thompson and Mark Mays are expiring. Nominations are in order. See you in Ames.

DON'T BECOME A STATISTIC -- RENEW YOUR MEMBERSHIP!

Now that the harvest is in, there's time to take stock and tie up loose ends. That may include your PFI membership! Autumn is renewal time for Practical Farmers of Iowa. PFI President Tom Frantzen wrote a fall reminder that you should have received (please see the box below), outlining recent progress and goals for the coming year. It also introduced some new options for members:

- A three-year membership for $25. (This is especially for those of you who forget to write that $10 check every fall.)
- Participation in a "mentoring" program that will link students interested in sustainable agriculture projects with producers. (See the article on page 7.)
- On-farm trial results from PFI members. A number of members who are not PFI cooperators conduct their own replicated trials. PFI is inviting members to pass on that trial information so it can be shared.

(Continued next page.)

MEMBERSHIP RENEWAL ERROR ! !

-- Rick Exner

The Membership Agreement and Information Form that you received with Tom Frantzen's letter probably incorrectly requests that you ***pay PFI $0.00.*** Only a few recently joined members are asked to pay nothing in the fall renewal time. I do apologize for the mistake.

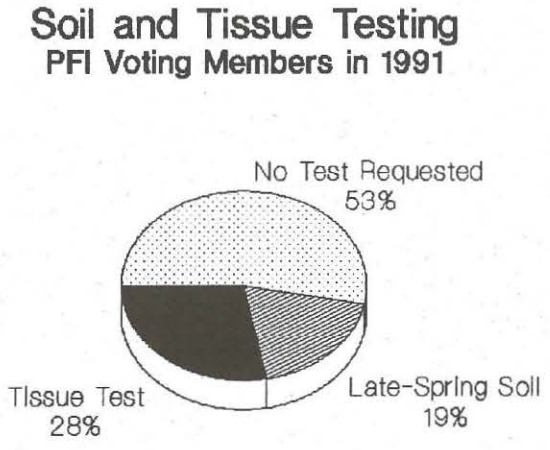
More than a few members have sent in their $10 anyway. Others have completed the form without a check. The corrected forms are going out with this newsletter to those who have not paid according our records. If the check is in the mail, no additional action is necessary on your part. If you have not renewed you membership yet, this can be a reminder.

Expanded "freebie" options. If you join or renew your membership for 1992, you may choose one of the following:

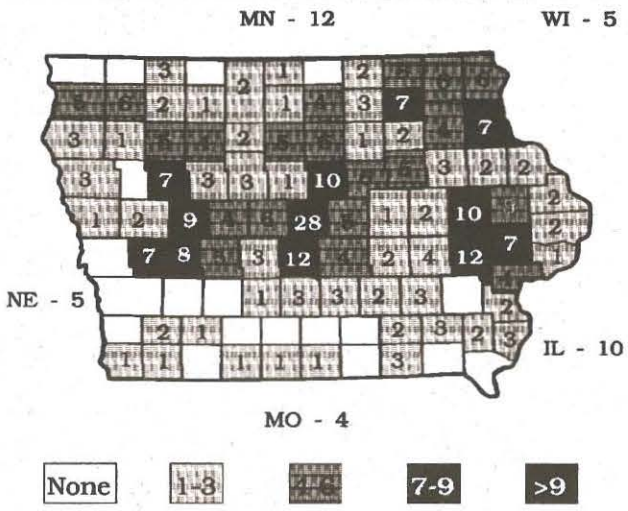
- one free leaf tissue test;
- four free late-spring soil nitrate tests;
- a free PFI cap (summer or winter style).

The place to specify these options is the PFI Membership Agreement and Information Form, which you received with Frantzen's letter. If you send in your renewal without the form, you may enclose a note asking that another membership form be sent. The information requested includes aspects of members' farming operations, marketing, and book keeping. This has been valuable in the past in bringing specific resources to members and in helping PFI members share with each other.

Here are some statistics on PFI membership. Total membership as of this fall stands at 384. Of those, 194 (51%) have identified themselves as gaining a major part of their living from farming in the state of Iowa and are consequently voting members. Another 140 (36%) have identified themselves as associate members. Fifty members (13%) have not returned the Information Form and are not classified. A "freebie" option was elected by none of the unidentified members, 17% of the associate members, and 47% of voting members. See the pie chart.



Of the 384 members, 340 live in Iowa. The map below shows their distribution. If you are curious who the PFI members are in your area, contact your district PFI board representative or the Extension/PFI coordinators in Ames.



Each winter, PFI membership takes a dip because of people who do not renew. Don't let your name be added to the statistics of the expired! Remember, you can renew by attending the winter PFI membership meeting, Dec. 9. Or send your $10 renewal check to: Practical Farmers of Iowa, RR 2, Box 132, Boone, IA, 50036.

PFI EDUCATION PROGRAM OVERVIEW

-- Gary Huber

The PFI education program is funded from two grants. One is from the Educational Foundation of America, which was established by Richard Prentice Ettinger, founder of the Prentice Hall textbook publishing firm. The other is from a USDA funding program known as ACE, "Agriculture in Concert with the Environment." ACE is a division of the LISA ("Low Input Sustainable Agriculture") Program, which is now known as SAREP ("Sustainable Agriculture Research and Education Program.")

The goal of the education program these grants support is the increased adoption of sustainable practices by Iowa farmers. This goal will be achieved through activities in two areas: 1) youth education and 2) communications enhancement. What follows is a brief overview of each.

Youth Education

PFI leaders have identified the education of youth about sustainable agriculture as important because these young people will some day become Iowa farmers. Several projects are included in the grant proposals for youth education, each of which will require a number of activities to bring it into being. These youth education projects are:

- Adding sustainable agriculture practices and concepts to curriculum materials used by high school agriculture education teachers.
- Adding content on sustainable agriculture to in-service training of high school agriculture education teachers.
- Incorporating the on-farm research design into high school agriculture education classroom projects and FFA field plots.
- Conducting a mentoring program that links PFI members and SWCD Commissioners with students for structured learning experiences related to sustainable agriculture. (See the following article.)
- Helping establish sustainable agriculture demonstrations and field trials at the 4-H Education and Natural Resource Center near Madrid.
- Establishing a program for organized visits by 4-H groups of PFI cooperators' research plots.
- Conducting educational programs and field days for members of the Young Farmers Educational Association.

An important need for many of these youth education projects is the development of relationships between the PFI education coordinator and agriculture teachers. Details have been developed on each of the projects. People interested in learning more need to contact the PFI education coordinator at (515) 294-1923.

Communication Enhancement

PFI leaders have identified a need for materials about sustainable agriculture. Therefore, some of the grant money will be used to prepare and produce bulletins that explain basic "how to" steps for implementing sustainable agriculture practices.

Additionally, the grants call for the education program to feature practical solutions to problems in the PFI newsletter, as well as publish articles and news releases in the popular press on sustainable practices and how to implement them.

YOUTH MENTORING: INVESTING PFI WISDOM IN AGRICULTURE'S FUTURE

The youth mentoring project, which is part of PFI's education program, is beginning to take shape. The goal is for young people to learn about sustainable agriculture through direct contact with PFI members or SWCD Commissioners. The learning will be structured, and information packets for participants are being developed. What follows is an overview of the project.

Why youth mentoring?

Data from the Census of Agriculture show that in 1987 over 8,700 Iowa farmers were 70 years of age or older, and over 7,800 were from 65 to 69 years old. Thus, in another six years over 16,000 Iowa farmers will either pass away or be over 75 years old. How to get young people into farming to follow these older farmers is one issue. Another is the type of knowledge these young people will have about farming. The latter is the concern that led to the mentoring project.

(Continued on page 9.)

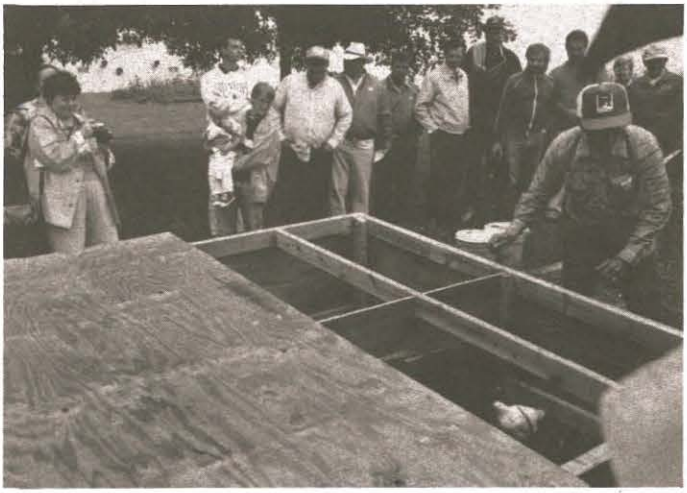
FIELD DAYS, 1991

Steve Sturgeon, SCS state soil conservation technician for Henry County, illustrates soil structural differences at the field day of Jeff and Gail Olson.

A shop-crafted rig for applying dry fertilizer, shown at the field day of Mark and Rita Mays, Wilton. The screen, standing upright, is used in filling the hoppers.

The last to leave a field day are often those discussing the fine points of machinery.

The yields are in for Don Davidson's comparison of drilled and ridge-till soybeans. Come to the winter meeting to find how it turned out.



Rotational grazing for chickens? Mike Reicherts demonstrates a moveable pen.

And then sometimes it rains on a field day. The show goes on -- between claps of thunder.

(Continued from page 7.)

What is mentoring?

Mentoring is different from simply trying to teach someone something. It's a nurturing process aimed at helping another develop certain skills. These skills typically are related to being able to apply one's abilities to influence the condition of one's own life. Thus, mentoring is a caring and careful process for conveying knowledge and skills that are centrally important to peoples' lives.

Ideal mentors are wise, kind, humorous, and committed to their professions. They respect the person they work with, and they understand that their role is to guide and support this person's quest for knowledge and skills. What is sought is mutual trust and a belief in one another.

How will the mentoring project work?

There will be three groups of participants. One group will be made up of PFI members and Soil & Water Conservation District Commissioners who agree to be mentors. The second will be high school agricultural education teachers who will help link mentors with interested students. The third group will be students.

The first step will be forming mentor-student pairs, which involves locating willing mentors and matching them with students with the help of agriculture education teachers. The next step will be development of individual projects for students based on the interests of students and the knowledge of mentors. The third step will be doing the project, which should have a final product that will be one outcome of the mentoring process. This may be a report that the mentor and student prepare together, or a joint public presentation.

The information packets being developed will help participants understand and be a part of the mentoring project. What is needed at this point is willing mentors. If you have an interest, please call or write Gary Huber, the Extension/PFI education coordinator.

PFI SUSTAINABLE PROJECTS HELPS IOWANS DEVELOP OPTIONS

-- Maria Rosmann,
PFI Public Relations Coordinator

PFI newsletters will always report on the happenings, the triumphs and the occasional pitfalls experienced by farmer cooperators in the course of their on-farm research projects. Their goals are often the same -- the attempt to move toward more sustainability in our farming practices.

What about all the people who aren't part of this cooperative research team? What about urban and other rural people who would like to find solutions to a problem, study ways to make a change, or assist in the adoption of a more sustainable way of living?

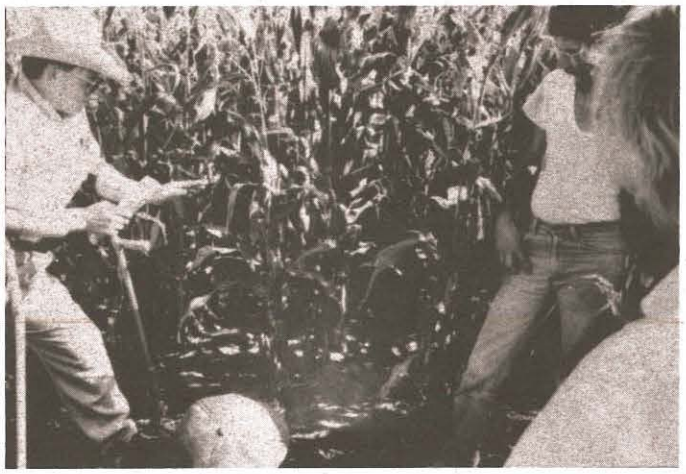
Enter the *PFI Sustainable Projects* program. Having just finished its second year, *Sustainable Projects* encourages Iowans to deal with issues of sustainability on a small scale, or sometimes as part of a larger project.

Sustainable Projects, funded with support from the Northwest Area Foundation, has enabled 15 projects to get off the ground and completed in these two years. The projects, scattered throughout Iowa, vary in their content and direction. In addition to on-farm research, *Sustainable Projects* has funded public programs, programs involving municipalities, and a unique one tying into our past. The interest and number of applicants has increased, and the proposals coming in are generally strong and highly imaginative. Two projects administered in 1990 are worth discussing.

Historic Gardens

If you've had the opportunity to visit the "Old Fort Madison," you no doubt have seen a large exhibition garden located between the Trading Post and the Stockade. This garden was established in part with support from the *Sustainable Projects* program. It's a garden which documents the actual crops grown in the early 1800s. Meticulous work was put into its creation.

Part of the historic gardens at the Old Fort Madison.



Richard Godke, Henry County Extension agriculturalist, discusses *Sustainable Projects 1990* yard waste project.

The garden is divided into four sections: 1800s era vegetables, herbs/medicinals, Native American plants, and craft or utility plants. The Old Fort Madison hosts 30,000 visitors annually and is the site for many educational and special interest tours as this community strives to appreciate the past while it builds for the future.

According to Linda Lundberg, member of the Old Fort Commission, *Sustainable Projects* has: "supplemented greatly the research and development effort of the Old Fort. From a historical and visitor's perspective, it has fulfilled the need to make our site even more authentic. We are most appreciative of the *Sustainable Projects* grant."

Yard Waste Recycling

In another project, the Henry County Extension Agriculture Committee worked with the local SCS, the city of Mt. Pleasant, and an Iowa State University Extension area agronomy specialist to see if municipal yard waste could be used to reduce the need for cultivation and herbicide use in corn production. A demonstration plot (set up similarly to PFI field plots), was funded by *Sustainable Projects* to cover a part of the expenses. In a nutshell, a replicated plot compared corn grown in a mulch of grass clippings and leaves with a non-mulched crop. The bagged waste was hand-spread by a volunteer senior citizens group. Among the problems encountered were field conditions, wet waste, and a variety of yard waste (inconsistent in moisture, structure, texture and weight). Weed control was achieved from the mulch, and analysis of the grass clippings showed a high rate of available N, P and K.

The yields of the corn planted at the site varied due to some summer flooding. The mulched field did show a higher corn yield than the non-treated. The investigators decided that hand-application of bagged waste is not economical for their community. However, they did conclude that direct land application *may* be an effective and practical method for cities and larger municipalities to deal with the vast amounts of yard waste they generate.

Sustainable Projects 1992

These are just two of the programs carried out. Most proposals call for grants in the range of several hundred dollars. Some projects are shining successes, others aren't as visible, yet each one was judged to be of merit. The selection committee consists of PFI members and board representatives, the PFI coordinators, and representatives of ISU, including the Leopold Center for Sustainable Agriculture.

Although *Sustainable Projects* is administered by PFI, applicants NEED NOT BE PFI MEMBERS, nor does membership in the organization have any bearing on selection. *Sustainable Projects* is successful because the grant recipients share the results of the projects.

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SUSTAINABLE PROJECTS 1992 PROPOSAL FORM

PRACTICAL FARMERS OF IOWA

WITH SUPPORT FROM THE NORTHWEST AREA FOUNDATION, ST. PAUL, MN

Sustainable Projects is designed to allow citizens of Iowa to carry out activities that focus on agriculture and the environment. Sustainable agriculture has been described as preserving the soil and water resources as well as the people involved in agriculture. What could a Sustainable Project be? Maybe you want to undertake an on-farm trial like those used by the farmer cooperators in Practical Farmers of Iowa. Maybe you would like to create a specific program for the local school or FFA that teaches about the relationship of farming to the environment. Perhaps you need support to have an educational booth at the county fair. Maybe you could use some funding to bring your community leaders together on a related issue. Be creative!

Proposals for up to several hundred dollars will be accepted. (PFI cooperators, for example, receive as much as $400 for an on-farm trial.) It is legitimate to include in the proposal payment for your own time. temize labor and other costs in the budget you submit. Large equipment purchases will not be funded; however, equipment leasing may be used in proposals to defray equipment costs.

In return for funding your Sustainable Project, we ask that you agree to share both project results and the *process* that you went through carrying out the project. That will help us to build on past experience and share the successes of the program. A credible "feedback," or reporting plan is one of the criteria on which proposals will be evaluated!

Projects will be chosen by a committee consisting of PFI members and board representatives, the PFI coordinators, and representatives of ISU, including the Leopold Center for Sustainable Agriculture. Proposals for 1992 are due by Feb. 1. Committee decisions will be announced by March 1.

Please return this proposal form to: Practical Farmers of Iowa, 2104 Agronomy Hall, Iowa State University, Ames, Iowa 50011

Name _____

Address _____

Zip Code _____ Telephone _____

(OVER, PLEASE)

PFI SUSTAINABLE PROJECTS 1992

This form must be typed. You may use additional paper.
Please include an itemized budget.

Please describe the problem that this project will address and why there is a need for the project.

Please describe what you will do in the planned project, itself. Be specific.

How will you communicate to the public about the project? What kind of reporting to Sustainable Projects will you carry out?

What is the amount of money you need to carry out the proposed project? Please itemize.

(Continued from page 10.)

(See, for example, the box at the right.) People in Iowa who receive newsletters, who read the hometown newspaper, or who listen to various broadcasts have had the opportunity to learn about these projects. It has proven to be another viable form of communication about the issues, methods, and benefits of sustainability.

Interested? The call for 1992 proposals appears on pages 11-12. These applications will be due February 1, 1992, and the grant recipients will be announced by March 1.

NOTES AND NOTICES

Farm Manager Sought

Thinking ahead to the crop year ending fall 1993 and beginning January 1994? Century Farm seeks manager who is interested in **practicing sustainable agriculture**. Farm sits on the western edge of Loess Hills, one mile from the Little Sioux River, with 100 acres of bottomland and 160 acres of loess hills pastureland. It currently maintains 35 head of stock cows, farrow-and-finishes 400-600 pigs/year, rotates corn/soybeans/alfalfa/silage. If interested contact Reese Homestead Ltd., RR1, Box 52, Turin, Iowa, 51059, (712) 353-6770.

Biotech Project Coordinator Position

The Wisconsin Rural Development Center (WRDC) is currently seeking a coordinator for its Biotechnology Project. The project aims to bring a citizen's voice to the debate about the future of agricultural biotechnology, its implications for sustainable agriculture and family farms, and its environmental, social, ethical, and political implications. Salary is $22,000--$24,000 plus a health insurance contribution. Application deadline is November 30, 1991.

Applicants need a master's degree in the biological or social sciences, should be familiar with the concepts and terms of biotechnology, and be able to work well

(Continued on page 14.)

AN ANNUAL FORAGES PROJECT

-- Tom Frantzen, Alta Vista

I was awarded a PFI Sustainable Projects grant in 1991. My project involved demonstrating two uses of some alternative annual forages. One use was as a cover crop following oats when oats are grown in a strip intercropping system. The other was as alternative forage for grazing.

Crimson and berseem clovers winterkill at 20 F, and they are more expensive to seed than common red clover. In the strips we observed that: l) both berseem and Crimson clover are too aggressive when planted with the oats; 2) both clovers performed poorly when overseeded into 8'' tall oats; and 3) Both clovers grew vigorously when seeded after oat harvest in freshly built ridges.

Extension Crops Specialist Brian Lang helped select some annual forages for grazing. We planted crimson clover, berseem clover, tyfon (a modified version of Dwarf Essex rape), and a commercial blend of annuals called ''Laugh and Grow Fat!''

The rape provided excellent pasture even into the late fall. I observed that in controlled grazing, swine will neglect the rape if offered several species to graze with rape. If one paddock is all rape, the gilts will readily eat this forage. It's short recovery time allowed for frequent grazings. In 1992, I will continue to experiment with annual crops for grazing, including Elliot perennial ryegrass and forage chicory.

"Hog Heaven," grazing annual forage legumes.

with academics, farmers, policy makers, and citizen groups. The coordinator will research state and federal regulatory mechanisms for biotechnology as well as biotechnology activities of the University of Wisconsin. The coordinator will communicate with the university community, state and national organizations, and the general public on biotechnology issues, working closely with Project Advisory Committee and WRDC staff.

For information about this position, contact Katherine Griffith at (608) 437-5971.

On-Farm Research in Oregon .....

Growers in Oregon are now supported in their efforts to generate reliable information on the farm. The Western Oregon On-Farm Research Project made awards to seven farmers in 1991. Included were an agroforestry grazing project, chestnuts as an alternative crop, cover crops for weed control, composting for nitrogen management, and biological pest control. The program, which is funded by the Northwest Area Foundation, is coordinated by a growers' technical committee, the organization Oregon Tilth, and the Oregon State University College of Agricultural Sciences.

..... and in Missouri

The Center for Sustainable Agricultural Systems (see article by John Ikerd on page 20) wants to identify 15-25 farmers to conduct on-farm trials in 1992. Participating farmers will choose trials to answer their own questions. The Center, through the University of Missouri, will assist with design and analysis of the trials. Anticipated topics of trials include tillage, cover crops, intensive grazing, and agroforestry.

Farm Invention

Charles Newbold received a patent on June 26, 1797, for a cast-iron plow, but he was unable to convince farmers that it would not contaminate the soil.

PFI To Co-sponsor Northeast Iowa Controlled Grazing Workshops

Controlled grazing is a new technology that is rapidly being adopted by a growing number of profit-oriented dairy, beef and sheep producers. It cuts production costs and improves pasture productivity. These practical, how-to workshops will help farmers design a grazing system to fit their farm. Topics will include; paddock layout and design; new portable fencing products; animal nutrition; and low-cost pasture renovation options. Want to get started with controlled grazing? This workshop is for you.

The course will be led by Richard Ness. He has an M.S. from Iowa State University in animal science and has been doing on-farm research in controlled grazing the past seven years. Co-sponsors of the workshop include: Iowa Cooperative Extension Service, the Land Stewardship Project, Northeast Iowa Community College, and Practical Farmers of Iowa.

This is an eight hour workshop held in two four-hour sessions. The course will be presented: Thursday, January 16 and Friday, January 17, 1992. Time: 1:00 - 4:00 p.m. Location: Northeast Iowa Community College Calmar Campus, Wilder Bldg., Room 105. Cost: $40 ($20 for additional family members).

To register send the tuition made payable to Northeast Iowa Community College, P.O. Box 40 , Calmar, Iowa 52132. Please include your Social Security number. For more information contact Connie Hvitved, NICC, 1 (800) 728-2256.

Take Charge Meeting Jan. 31, in Waverly

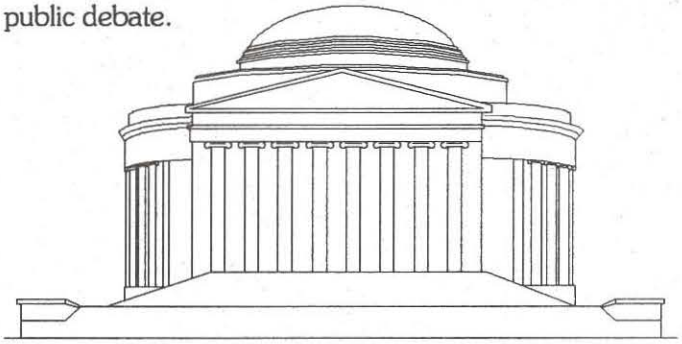
The Rodale Institute (with PFI's assistance) is planning a *Take Charge* workshop for Jan. 31, at the Trinity United Methodist Church, in Waverly. The theme of the meeting is "Sustainable Farming Practices and Waste Management for Northease Iowa." Speakers include Pete Allen, of the Center for Holistic Resource Management. Information: contact Barbara May, 611 Sigfriegdale Rd., Kutztown, PA, 19530, (215) 683-6383.

Rosmann To D.C. For National Research Initiative

PFI cooperator and past president Ron Rosmann, Harlan, has been named to a committee that advises the United States Department of Agriculture's Competitive Research Grants Program. In November, Rosmann travelled to Washington, D.C. for the meeting of the "users group" that focuses on grain production.

In the 1990 farm bill, Congress authorized formation of the "National Research Initiative" (NRI) to support basic and applied research on the national and regional level. The bill directed the NRI to support the development of sustainable agriculture through research to enhance environmental quality, make efficient use of on-farm and nonrenewable resources, integrate natural biological cycles, and sustain family farms and the quality of rural life. Rosmann's participation on the committee was part of an effort to draft specific suggestions toward this goal.

Part of the groundwork for the NRI meetings was laid last summer at a national conference attended by research administrators, scientists, policy analysts and farmers, including PFI cooperator and board member Richard Thompson. This panel produced recommendations on the implementation of agricultural sustainability in NRI programs. The report of this panel, *Sustainable Agriculture in the National Research Initiative*, is available for $5.00 from the Center For Rural Affairs, P.O. Box 405, Walthill, NE, 68067. Another report, *Research for Sustainability?*, available for $8.00 from the Center, examines the dynamics of federal research priorities for agriculture, making the case that publicly funded research is a form of "social planning," and thus a legitimate subject of public debate.



ONE LUMP OR TWO? -- WHAT DOES PLANT SUGAR TELL? (MORE THAN YOU WANT TO KNOW!)

-- Rick Exner

There is some interest in using an instrument called a "refractometer" to measure corn stalk or leaf sugar levels to diagnose the health of the crop. The thinking is that high sugar is a good sign, since sugar is produced by the energy trapped in photosynthesis, and photosynthesis is what plants are all about. As such, plant sugar is presented as a new "window" on the health of the crop, a window that may reveal information that other diagnostic tools don't show.

The Refractometer

The refractometer used in the field is a hand-held optical device that makes use of the fact that light is bent when it passes from one transparent medium (glass, air, your eye) to another. The refractive index of water changes with the amount of dissolved materials in it. A refractometer reading of plant sap actually reflects not only sugars, but proteins, amino acids, organic acids, and salts.[2] Total sugars represent only about half the soluble solids measured by the refractometer in corn sap.

Although there are exceptions, many researchers have found an acceptable correlation between plant sugars and the "Brix" unit readings of soluble solids given by refractometers. A correlation means there is a relationship, not necessarily an equivalence. That relationship can be different for different hybrids, for example.[11]

Taking into account that the refractometer is measuring other things in addition to sugars, what can be done with the instrument? Refractometers are commonly used in the sugarbeet and fruit industry to estimate the quality of the crop. But these crops are sold on sugar content -- corn is not. What is the relationship of sap sugars to grain harvest? To begin to understand, we need to look at four interrelated factors that contribute to

yield and corn sap sugar. These four factors are: *hybrid selection, population, fertility, and disease.*

Hybrid Selection

Sap sugars are low in a healthy, growing plant because as fast as they are synthesized, they are converted to starches and cellulose in new tissue. As growth slows and tasseling approaches, sugars accumulate rapidly in the sap.[1] A high grain yield requires that a lot of sugars are translocated to the ear and converted to starch. Hybrids have been observed to accomplish this either by: 1) building up a great deal of stalk and leaf sugar and then moving part of it to the grain; or 2) accumulating a moderate amount of sugar and then moving almost all of it to the grain.[11] Sugar comparisons across hybrids or between plants at different stages of growth are therefore unreliable predictors of grain harvest.

Population

The ideal plant population density for each corn hybrid varies with temperature, moisture, light, fertility, and other factors. If there are too few plants per acre, high stalk sugar may be observed at the dent stage since there aren't enough ears to use the photosynthate (sugar) produced from the extra sunlight the plants receive.[4] If too high a population leads to reduced seed set due to crop stress, sugars also accumulate in vegetative (non-grain) tissue. In a study of different populations, higher stalk sugars at dent stage were associated with reduced grain yield.[12] On the other hand, if the population is only a little higher than optimal, the filling ears may place a high demand on stalk tissue, depleting stalk sugar reserves at physiological maturity.[10] Thus differences in population densities can can cause differences in the sugar content of plant sap.

Even in the same field, positional differences between plants lead to effective differences in competition. The rate of photosynthesis in a corn leaf exposed to full sunlight is ten times that in leaf tissue shaded by another leaf.[4] One researcher found that because of plant-to-plant differences, a ten-plant sample was too small when measuring soluble solids.[3] Drawing conclusions based on a single corn stalk or leaf would be even more hazardous.

Fertility

Potassium is involved both in the transport of sugars to the ear and their synthesis into starch.[7] A number of studies have shown a negative relationship between potassium fertilization and stalk sugar.[5, 7, 8] In the fertilized plants, potassium was apparently doing a better job of getting sugars stored in the grain as starch. High stalk sugars were here a sign of nutrient deficiency, not plant health.

A study done in Iowa also showed that soluble solids in the sap at post-silking decreased when potassium concentration in the sap increased.[6] But the same study found a positive association between sap potassium and soluble solids at physiological maturity of the crop. Evidently the additional potassium, after helping move sugars into the grain, allowed the vegetative tissue to retain its integrity and photosynthetic activity later in the season. The condition of the stalk at this time is important because of the threat of stalk rot.

Disease

There is only so much photosynthate to go around. Plant breeders have generally had to choose between lodging resistance and yield, although there are studies that show not all high yielding hybrids are susceptible to lodging. Lodging can be averted by preventing pollination, which allows stalk sugars to remain high.[9] Alternatively, lodging has been stimulated by removing the lower six leaves of the crop at silking, preventing photosynthesis from recharging stalk tissue with sugars.[7]

When there is lodging in a corn crop, why do certain plants go down while other, genetically identical plants remain intact? Part of the answer is probably stress induced by microdifferences in field position. One study found 10-15% more kernels on plants with rotted stalks

than on healthy plants.[4] Kernel formation begins about 25 days after germination, and the number of kernels formed is determined by both genetics and the microenvironmental conditions of light, moisture, temperature, and fertility. If these conditions deteriorate after the potential number of kernels has been set, developing kernels may place too great a demand on the stalk and leaf tissue, sugars in the stalk will be depleted, and the stalk tissue will lose integrity and rot.

So, while high stalk sugars late in the season play a role in preventing lodging, they may be a sign that grain-fill was incomplete. It is not known whether the sugars themselves prevent stalk tissue deterioration or whether the sugars are merely associated with intact stalks for other reasons. At any rate, sugars are a good indicator of stalk tissue that can resist rot. On the other hand, it has been suggested that if some environmental stress like drought should kill the plant prematurely, these sugars could promote the growth of microorganisms.[1]

Summary

Where does all this leave us on using the refractometer to measure the health of the corn plant?

1) Plants produce sugar with the energy from photosynthesis.

2) The refractometer is an acceptable indicator of sap soluble solids, about half of which are sugars.

3) Sap sugar content changes with hybrid, time of year, time of day, and microenvironmental conditions that cause differences from plant to plant in the field.

4) To produce a high yield, a corn plant has to move a lot of sugar into the developing ears, where it is converted to starch. But the content of sugar in vegetative tissues is not a direct indication of this capability. Hybrid differences, stage of growth differences, and nutrient deficiencies are among the factors that intervene.

Can the refractometer be taken seriously as a diagnostic tool? When a farmer takes corn leaf tissue samples for nutrient analysis, the laboratory specifies 25 leaves per sample. While there are no absolute sufficiency levels for leaf tissue, Practical Farmers of Iowa has found these tests useful in detecting nutrient *differences* between treatments in *replicated* field trials. We won't know for certain whether the refractometer can be taken seriously until we see it used in the same scientific way that tissue nutrient tests are done in PFI. In the mean time, be cautious of the single-sample, more-sugar-is-better approach that promises a new window on the health of your crop.

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RESEARCHERS IDENTIFY SURVIVAL STRATEGIES OF WISCONSIN DAIRY FARMERS

-- Kathleen Duffy, CIAS

(Editors' note: This report comes from the Center for Integrated Agricultural Systems (CIAS), which was established by the Wisconsin State Legislature to coordinate research relevant to sustainability and family farm issues. The full story contains sections dealing with the case study methodology. Kathleen Duffy works for the Center.)

Successful dairy farm strategies combine not economics and technology, but family philosophy and tradition. A CIAS-funded study of eight whole-farm cases from around the state describes four main strategies that farmers use. From these cases Herman Felstehausen, University of Wisconsin-Madison professor of landscape architecture and natural resources, identified factors and trade-offs necessary for long-term survival.

Key Strategies

The strategy a farm family chooses depends mainly on its accumulated resources, the family's views of farming, and the age or life cycle of the farm owners. Felstehausen identified four main strategies from looking at internal differences among cases:

- high-tech
- alternative/experimental
- mainstream
- traditional

A strategy's success depends on how the family puts together key input and decision factors. These factors are common to all dairy farms. They included personal and political forces as well as physical and economic constraints. Primary factors from the study were: 1) feed-equipment-land relationships, 2) time-labor strategy, 3) finance-debt strategy, 4) family continuity and generational transfer, and 5) communication networking and participation practices.

The research suggests that some of the best strategies result from farmer experimentation, communicated through interpersonal networks and adopted with very little professional or outside help. Case families felt a good working strategy had to be stable and long-term -- able to accommodate not only large swings in the economy but also personal misfortunes.

When farm people talk strategy, they mix all categories together. Seldom do they dwell on fine points the way economists and scientists do. A typical strategy begins by thinking about everyday subjects: the work day, expenses, crops, and cattle. The most common units of reference among farm people were pounds of milk per cow per day, pounds of feed for various production levels, hours per day spent milking, tons or bushels per acre of main crops, and generalized costs of fuel, electricity, vet bills, and so forth.

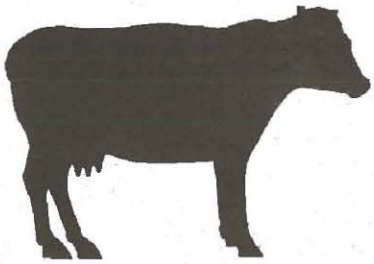
Alternative/Experimental vs. High-Tech Strategies

Felstehausen discovered that all farm people consider the same kinds of information, but move strategically in different directions. One farm couple said "We realized that if we kept our costs to a bare minimum, we

could make more than $1,000 profit per cow. With only 35 cows, we could have a comfortable income." The strategy to achieve that, however, is very different from mainstream farmers.

All dairy farmers think in terms of benchmarks. For example, a typical cow gives 50-55 pounds of milk per day. That adds up to 16,000 pounds per year. At $11.00 per hundred, that cow is bringing in $1,750. She requires 40-45 pounds of dry matter per day, 25 pounds from forages and 17 from a grain/protein feed mix. The forage can be produced on the farm. The grain mix will cost $400 per cow per year -- half that amount if the farmer supplies his own corn.

But to put a low-cost strategy together requires exploring a lot of alternatives. Case farmers say they set their own rules: no expensive supplements, no high-cost machines or structures, no expansion, no new land purchases, no regular outside labor. They accept a moderate herd average. The lowest-cost small operator used a grass-based feeding system. It was stable and manageable for two persons, and highly profitable.



The high-tech farmers started with the same information, but thought about it differently. They were inclined to take a modern business approach: "How can I expand? Remain competitive? End up with a larger than average income?" These farmers aimed for 20,000 to 22,000 pound herd averages.

More feed required more land, more than two persons worth of labor, and large equipment and structures. Larger equipment tends to be newer -- meaning higher cost. All logic pointed in the same direction: herd size must be increased in order to achieve efficiency of scale, even if that meant borrowing money at interest rates above profit rates.

In the study, alternative-experimental strategies showed the highest per-cow profit, high-tech strategies the highest per-cow milk production. But high-tech farms were barely able to meet expenses from milk sales. They remained profitable nevertheless by aggressively developing supplemental income sources such as specialty crops or breeding stock.

Credit Alternatives

None of the farmers in the study considered heavy use of commercial credit to be wise at this time. (Several case study farms were in financial trouble because of long-term debt.) Farm families were not opposed to borrowing if profit rates matched interest rates and if the lender's hold over the farm remained negligible. Otherwise, the conclusion was to seek non-commercial alternatives.

One option was to shift to internal financing. Fathers, uncles, grandparents, brothers, etc. often allowed some of their savings to be used to finance the next generation. This type of arrangement is flexible, low risk, low cost, and avoids service charges (meaning no bankers or lawyers needed).

One case study family, well established and recognized as profitable, gets equipment dealers to finance new machine purchases. Because dealers are anxious to make sales, they allow the farmer to spread payments over two or three years without charging interest.

Another alternative from the study was to acquire and transfer capital through labor arrangements such as partnerships with family members or outsiders. If the arrangement did not work out it could be terminated without losing the farm, whereas bank termination was considered catastrophic.

Labor Options

Generally, the labor rule for all strategies was to avoid permanent non-family workers. The most common strategy was to utilize family members. A popular way to do this without paying cash was to give family members a stake in the business. The strategy on farms

without family present, was to cut back in scale, or to eliminate labor-intensive practices in order to make it possible to cover daily activities with one-and-a-half to two persons. High school students or neighbors were often hired on a part-time basis.

Results from the study suggest that farmers are much more willing than their advisors to consider scaling back as a means to avoid labor costs.

SUSTAINABLE RURAL COMMUNITY DEVELOPMENT

-- John Ikerd, CSAS

(Editors' note: John Ikerd is an agricultural economist with the Center for Sustainable Agricultural Systems (CIAS), which is operated jointly by University of Missouri Extension and the Missouri Agricultural Experiment Station. This article appeared in the March-April issue of the center newsletter. It is a thought-provoking little publication, and every once in a while it introduces and defines a new term. "Paradigm" is a term used in this article. Ikerd describes a paradigm as "a way of thinking about something, a mental model or mindset.")

Sustainable rural communities must utilize their natural and human resources in ways that conserve the non-renewable resource base, protect the physical and social environment, and provide an acceptable level of economic returns for those who work and live in the community.

In many rural communities in Missouri and elsewhere, continuing development of local natural resources (including minerals, water, climate, and land) by conventional means has been based on the substitution of capital and commercial inputs for labor and management. Inputs originating outside communities have been substituted for local labor, local management, and locally supplied goods and services. This trend has been particularly true in the case of agriculture. The logical result is that fewer and fewer farmers operate larger and larger farms. These larger farms purchase inputs from distant suppliers and sell raw commodities to large processors in distant markets. The result has been a continuing decline in the numbers of farmers, farm families, and agriculturally related economic activity in most rural communities.

Conventional agriculture is characterized by production of raw commodities in specialized farming operations that rely primarily on commercial inputs for plant and animal nutrients and for disease and pest control. Competitive pressures have encouraged farmers to become larger and to purchase and sell in large quantities in order to survive. Farmers have been pressured to cultivate erodible land and to rely on chemical fertilizers and synthetic pesticides. These practices have raised public concern, based on real or imagined risks, regarding the long run sustainability of conventional systems of farming. These same factors raise concerns regarding the continuing productivity of the rural resources (natural and human) and the quality of the environment (physical and social) in rural areas.

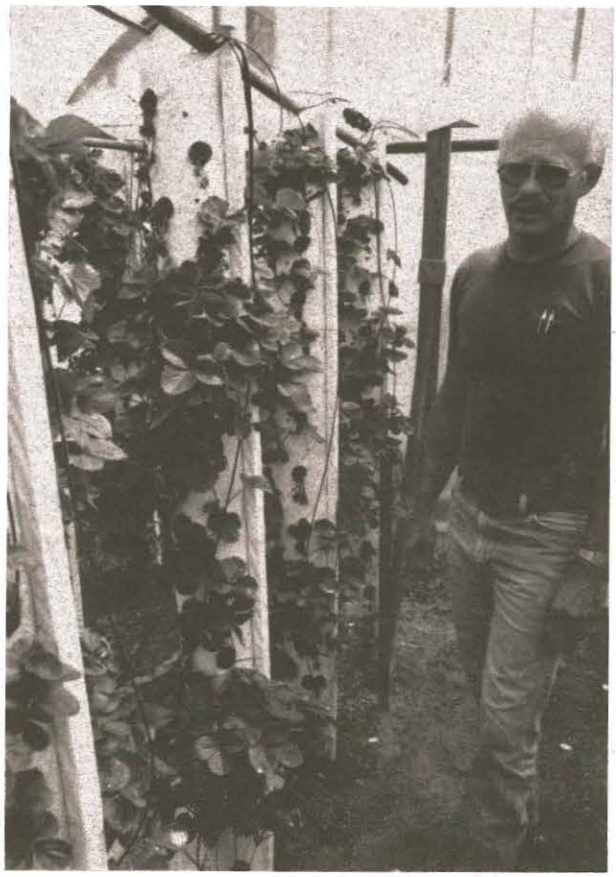
Many rural communities no longer depend on agriculture for economic development. They no longer have a sufficient agricultural resource base to support a significant agricultural component for their rural economy, at least not with conventional farming methods. They are looking to other industries which utilize a different set of human and physical resources as a means of long run survival.

However, many communities may be overlooking the social and economic potential of a significant agricultural resource base because they are operating with a conventional agriculture paradigm. The conventional paradigm is that fewer and fewer farmers will continue to buy more of their inputs from distant suppliers and sell raw commodities to distant marketing firms and processors. A new paradigm, a sustainable resource development paradigm, challenges this conventional wisdom concerning the future of rural communities.

This new paradigm relates to resource development in general, including development of agricultural and community resources. The sustainable farming systems paradigm is one of substitution of internal resources

(including labor and management) for external or purchased inputs while maintaining acceptable levels of productivity and profitability. Sustainable farming systems may require more farm operators, more farm labor, and more farm families than do conventional farming systems.

Sustainable farming operations in many cases may be smaller than their conventional counterparts. In addition, operators of sustainable farms may be motivated by environmental, social, and economic objectives. They may show a preference for local markets and locally available inputs if this preference does not threaten their economic survival.



Bob Graaf, Palmer, with greenhouse strawberries that he markets through local supermarkets.

The sustainable rural economic development paradigm extends the concept of sustainability to the next level of aggregation. Sustainable rural communities must find ways to substitute management of resources that are internal to the community for externally supplied inputs while maintaining an acceptable level of economic and social well being. Local natural resources may include climate, landscapes, minerals, or geographic location. But the most valuable geographically fixed resource for many communities is still agricultural land.

Sustainable agriculture may be a key element in developing sustainable rural communities. A sustainable agriculture may provide a stable, internal foundation for other economic activities in many rural communities. Such activities might include marketing and value-added processing of farm products; flex-time or part-time, off-farm employment; or ecology-based tourism. Thus, a sustainable agriculture may be only one element, but possibly an essential element, in developing diversified, integrated, sustainable rural communities.

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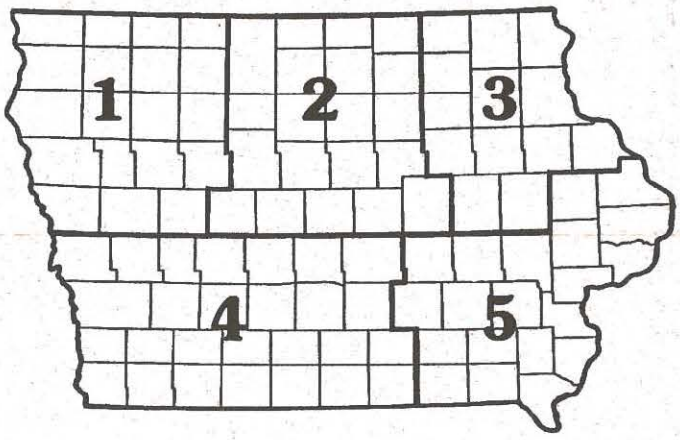

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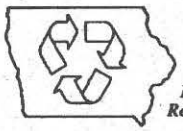

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