the Practical Farmer

Practical Farmers of Iowa Newsletter

Vol. 10, #4
Winter 1995

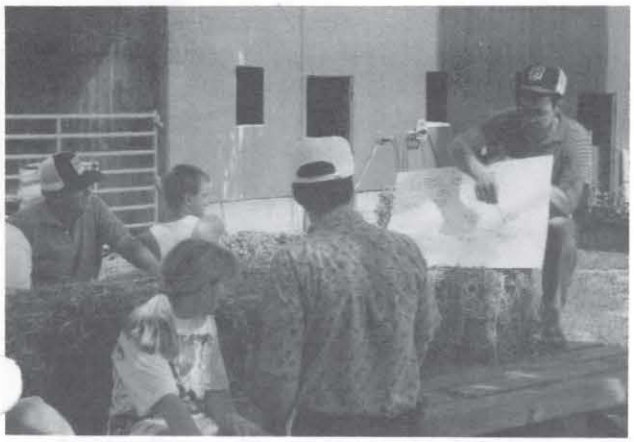
WHERE IS AGRICULTURE HEADED?

(Editors' note: Dave Lubben was elected President of the PFI Board of Directors at the annual meeting on January 6th. An articlie on Dave appears on page 11.)

Dave Lubben, Monticello

Each year I have the opportunity to facilitate a long-range outlook symposium. This round table discussion consists of 15 to 20 people, many of whom are farmers, bankers, industry representatives and university personal. The interesting part of the discussion involves the various backgrounds of the people invited. Since each person has a different job in the agricultural industry, each has a different point of view where agriculture is heading.

The overall objective of the round table discussion is to find the future trends in agriculture and examine the opportunities and the threats that may occur. We have to ask ourselves, "Are we asking the right questions of today's agriculture? What is the overall impact, how will this effect me and what must I do different in the future." All of the guests are challenged to extrapolate where



Numbers and concepts at the Lubben field day.

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IN THIS ISSUE

agriculture is headed over the next five to ten years?

I will share with you some of the questions posed to the participants, and maybe you would like to answer some of the questions yourself.

- "What new trends do you see in the grain industry over the next five years?"
- "What should be done to help the American farmer to get a bigger share of the US food dollar?"
- "What new trends do you see in the livestock industry (cattle & hogs) over the next five years?"
- "As we plant fence row to fence row, what happens to conservation practices without government farm programs?"
- "What will be the hottest topic or the biggest challenge in the agricultural economy one year from today?"
- "What do you feel will be the three most significant changes that will occur to our national economy over the next five years?"
- "What educational move do farmers need to make now to make sure they have a job ten years from today?"

Predictions from the outlook meetings:

- Farmers will divide into two camps. The conventional farmer will continue to get bigger and add debt. The sustainable camp will need to investigate the feasibility of specialty crops and direct marketing. Individuals will have to do more of their own on-farm research to get the answers they need. Diversity does not guarantee profit, only more challenges.
- Farmers must become more financially astute and develop written marketing plans. In the past farmers have tried to be independent, individualists. That era may be coming to a close. In order to compete in the next century, farmers will have to develop networks or alliances with other farmers, to combine individual expertise in production, marketing and financial skills. It's already being done in New Zealand, in grazing networks where they critique each other's management. Farmers will start new cooperatives that produce profits instead of cooperatives that produce services.
- The banking industry will also see many changes. There will be more reliance on performance lending, where they monitor cash flow projection and earning abilities. With the elimination of farm subsidy programs, lenders will need new tools to monitor farmers' financial skills and abilities.

We as farmers must maintain our ability to learn; we don't know what we will have to learn in the future.

WHO IS DOING THE THINKING?

Vic Madsen, Audubon

Editors' note: The following article is a slightly revised version of comments outgoing PFI President Vic Madsen made at the annual Practical Farmers of Iowa meeting January 6.

My wife says that there are times when I qualify as a grumpy old man. As I reviewed what I wrote for today it looks like this was written on one of those days.

The message I would like to share today is that after being involved with Practical Farmers of Iowa for ten years, I am convinced that long term profitability demands that we be able to think for ourselves.

For a minute, think about the industrial style of management and ask who is doing the thinking. For example:

1) Many farmers pay $500 per year or more for marketing advice. Who is doing the thinking?

2) The local fertilizer salesman takes soil samples, interprets them, and then makes application recommendations. Who is doing the thinking?

IS THIS YOUR LAST NEWSLETTER?

If there is a little frowning face on the mailing label of this copy ☹, you haven't responded to last fall's call to renew your PFI membership. We'd hate to lose touch with you! Take a moment to send in the form on the inside back page of this issue. Membership is a ***bargain*** by any standard! $10 per year or three years for $25.

3) The herbicide salesman makes the herbicide selection, determines the rate and custom applies the product. Who is doing the thinking?

4) Multinational swine breeding companies develop their secret-genetics gilts, sell them for two and a half times the fat hog price and sell the matching boars for $1,200. Who is doing the thinking?

You can probably add to this list, but I think you get the point.

There is a graph that Tom Frantzen uses in some of his talks. The idea is that the dollars of agricultural activity is divided between the marketing sector, the farm sector and the input sector. Since the early 1900s the marketing sector has had about 55% of the dollar activity. But the farm share has steadily declined from about 25% to 5%. The input sector has increased its share by almost the same dollars that the farm sector has lost.

I have a hunch that you could use the same trend lines to describe who is doing the thinking. Then the question arises: how did the input industry take over our thinking share?

In the book *Your Money or Your Life*, the authors talk about a common technique used by the advertising industry to get people to buy their product. It's rather simple. The goal is to create emotional instability in the potential customer and then provide the product to solve the emotional stress the ad created. I've fallen for that one many times. Life insurance companies are great examples. Their ads show sad people, which creates emotional instability in the reader – and then their product solves the problem. After seeing thousands of ads thousands of times, we believe we must do what is suggested in order to be attractive, prosperous, and well thought of.

So how do we take back control of our farms and do more of our own thinking? Maybe we should step back a bit and look at our farms like a jigsaw puzzle. Each of us has different sized and shaped pieces representing our land bases, capital resources, buildings, labor supplies, and personal and family goals. No one standing outside our farm can know it as well as the operator because they don't know our situation or personal goals. If the completed puzzle represents a profitable, sustainable farm, we need to remember that each of us must do our own thinking because everyone's puzzle is different.

ANNUAL WINTER PFI MEETING FEEDBACK

At the Jan. 6 winter meeting in Ames, more than 170 people listened to presentations from Michael Duffy and Laura Jackson, participated in the eight workshops, and took part in the producer poster session. The producer posters were popular among the thirty-seven people who turned in their meeting evaluations. But the greatest number of people noted their reason for coming to the meeting as the chance to visit with farmers. Through social interaction and posters, the main attraction at the annual meeting remains the attendees themselves.

Mike Duffy's talk on profitability was the next-most-listed reason for attending for the group overall, although Laura Jackson took the honors

Bernie Havlovic at the poster session.

among women and non-farmers returning the evaluation. Many people also came to learn more about *Shared Visions: Farming for Better Communities*. Overall, the most frequently cited workshop was *Keeping Track: Records and Decision Making*.

Statistics don't tell the whole story, however. A less-popular workshop, for example, could make a great difference to the right person. Here are a few responses to the question "What did you get the most from at the meeting."

Direct Marketing Meat – got info for our Shared Visions group. And Records and Decision Making. We were so inspired we worked on our goals all the way home.

Meeting other farmers and sharing ideas with them. I really enjoy the keynote address and the breakout sessions. The posters are also great – keep emphasizing and encourage others to get involved in.

Potential for change.

How could the meeting have been better? PFI members were forthcoming with suggestions.

Add a bulletin board for people to post questions, "classifieds," etc.

Enjoyed last year's Sunday worship service.

Keep things on time. District meeting was a disappointment – directors weren't prepared.

Dancing, music, PFI storytelling.

Laura Krouse, Mt. Vernon, led the discussion of changes in the articles of incorporation.

Workshops did not discuss big issues in sustainable agriculture.

Lighter meals.

This year people were asked for one good idea to increase membership in Practical Farmers of Iowa. Here are some.

Hold workshops in each district and encourage each member to bring along another farm family. Doesn't have to be anything fancy, the farmer-to-farmer contact is the most important.

Have more active district meetings and educational programs.

Put out news releases in small local papers about the results from the on-farm studies.

Don't be so conservative. I wish that PFI would be more adventurous and creative and colorful and not so boring.

Bumper stickers.

Develop relationship with community college ag programs.

WINTER MEETING WORKSHOP REPORTS

Thanks to the note-takers and amateur videographers, most of the winter workshops were captured in some way. Send in the form in this newsletter for the video or additional printed materials.

Making a Place for Children on the Farm

Presenters: Frances and Reuben Zacharakis-Jutz, Jessica Frantzen, Eve Abbas, Bryan Hoben and Margaret Smith (moderator)
Summary: Susan Zacharakis-Jutz
video available

"Cleaning barns, moving pigs, picking rocks, mowing grass, and housework!" came responses to "What are the worst jobs at home?" from farm kids Reuben, Jessica, and Frances. But they liked horseback riding, working with livestock, spending time at the pond, playing softball, and working with Mom or Dad. They also shared feelings that most of their friends don't understand or appreciate the

work involved in a family farm business, which makes them feel a little bit different. We enjoyed input from other children as well who attended this session.

Parents Eve Abbas and Bryan Hoben recognize that their children sacrifice some activities that other children enjoy, but think the advantages of learning responsibility is a fair trade. Both Bryan and Eve stressed the importance of evaluating each child individually for their abilities to take on new tasks as the mature. As a nurse, Eve is especially aware of potential dangers, but stressed introducing new jobs gradually.

Our panel and other conference participants shared wonderful insights into fostering a love of the land and the farm.

"Make time for fun--stop at the creek and see what's new when you go to move cows".

"Work together on both jobs you like and jobs that you don't like." "Start children young on easy tasks--like feeding the chickens." "Find what interests your children and help them pursue that area."

(Continued on page 8.)

A field day conversation.

Order and Input Form

Session Handouts

- ❑ *Michael Duffy talk*
- ❑ *Hoophouse hog production*
- ❑ *Direct marketing meat (Mike Mamminga)*

PFI Meeting Video Tape

❑ ($10.00 purchase) ..... $_____

Eight-hour tape contains opening comments by Vic Madsen, the Michael Duffy and Laura Jackson talks, and one session of each of *Direct Marketing Meat, What About an Off-Farm Job?, Hoophouse Hog Production, Making a Place for Children on the Farm, Records and Decision Making*, and *Production Contracts* (minus Neil Hamilton's talk).

Name: _____

Address: _____

State, Zip: _____

Make checks payable to:
Practical Farmers of Iowa
2035 190th St.
Boone, IA 50036–9632

Your Ideas Here:

A NAME for the new newsletter column featuring your questions / comments and an "answer panel" of PFI responders.

_____

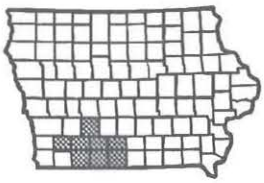
A NAME for the new PFI fund being established to increase the organization's financial stability.

_____

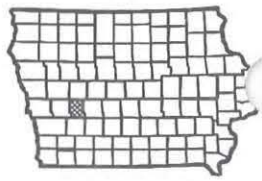
SHARED VISIONS

farming for better communities

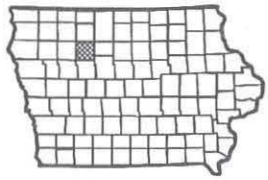
(Editors' note: Since most of this newsletter is devoted to results of trials done by cooperators involved in the On-Farm Research Network during 1995, the *Shared Visions* section is limited to brief summaries of the fourteen groups that are part of the Community Group Network.)



Ag Connect - Based in Lenox, this group is implementing a regional beginning farmer program. *Shared Visions* resources were used during 1995 to promote the program and develop a database of retiring farmers.



Audubon Graziers - This group's goal is to demonstrate that management intensive grazing (MIG) can be profitable, sustainable, and improve their community's quality of life. *Shared Visions* resources were used during 1995 to support on-farm research on MIG, to conduct a series of pasture walks, and to develop a grazing library at the local Extension office.



Cattle Feeders' Community Alliance - This Pocahontas County group wants to diversify local farms by bringing cattle back to the area. They specifically want to produce beef of superior quality and develop arrangements to share the benefits that accrue from this quality among the people involved.

Coalition for Holistic Agricultural Resource Management (CHARM) - The goal of this NE Iowa group is to achieve a high quality of life for their families and communities based on ecologically-sound and economically-viable farming practices. They are using the Holistic Resource Management (HRM) decision-making model and the help of group members as a mentoring team to achieve this goal.

Farm Fresh CSA - This Benton County group's goal is to benefit local farmers, consumers, and communities by enabling local growers to market their fresh produce to members of their community. To achieve this goal, they are developing a Community Supported Agriculture (CSA) project. *Shared Visions* support was used to promote the CSA and document their experiences.

Farms Forever - This group's goal is to enhance communication

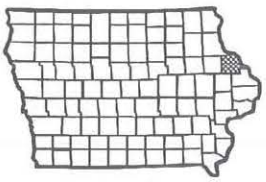
between rural and urban citizens of Louisa County. Support from *Shared Visions* in 1995 was used for several evening tours of farms of local families involved in alternative crops and farming practices. Support in 1996 is being used to develop a directory of local producers who want to market directly to area residents.

Hampton Area Rural Development Action Committee - The goal of this group is to investigate the feasibility of adding value to area crops and livestock. They are currently looking closely at opportunities to produce and market high-quality, antibiotic-free pork.

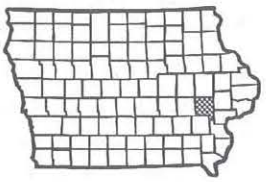
Jefferson County Group - This group's goal is to develop cooperation and harmony among Jefferson County residents and collaboratively examine and test ideas, crops, and products that are suited to their County and can help farm families be prosperous economically, socially, and environmentally.

Magic Beanstalk CSA - This Central Iowa group's goal is to create a local food system, build community ties, and expand awareness of the relationships between food, land, and people. They are reaching this goal by developing a CSA. *Shared Visions* support during 1995 was used to hold field days and collect information on labor requirements, harvest amounts, and profits.

Neely-Kinyon Farm Committee - This Adair County group has been planning research for a 160-acre farm near Greenfield that was given to the Wallace Foundation for Rural Research and Development. *Shared Visions* support is being used to investigate value-added options that will support area farm families and communities.

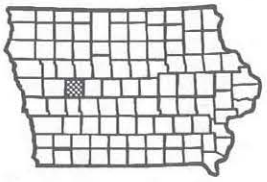


Northeast Iowa Congregational Supported Agriculture Group - Members of this East-Central Iowa group share an interest in working through area churches to help farmers directly market their products to congregation members. Their goal is to develop a cooperative organization to locally market diversified, healthy food products to their communities while providing producers the ability to be self-supporting.

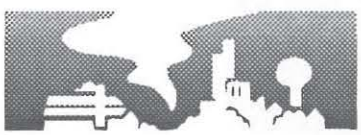


Prairie Talk - This Eastern Iowa group's goal is to create a sustainable, supportive, people-oriented community where consumers and producers cooperate to create a better world for themselves and generations to come. *Shared Visions* support is being used to develop and plan for the use of an educational resource library on organic farming practices.

Promised Land Beginning Farmer Program - This group began by working to establish a community-based beginning farmer program in the Grundy/Hardin County area. Support from *Shared Visions* is being used to create a guidebook for people wanting to start farming.



Total Resources Management Services - The goal of this Carroll County group is to develop options that allow livestock producers to utilize their manure as a resource instead of viewing that manure as a waste material. They are interested in a variety of options, but they are currently focusing on manure brokering.



(Continued from page 6.)

"Involve you children in decision making."

"Remember to praise your children when they do well and be gentle with reminders of how they can improve."

"Above all, share your joy!"

Direct Marketing Meat

participants: Mike Mamminga, Robert Recker, Cindy Madsen, Mark Tjelmeland (moderator)
video available
additional materials available

Mike Mamminga, who is head of the Meat and Poultry Inspection Service of the Iowa Department of Agriculture and Land Stewardship, led off with a description of services offered by his office. He wants producers to understand – early in the game – how state and federal safeguards operate, because he wants them to be successful in their marketing. The Iowa inspection service can be reached at 515-232-1163. New state legislation now requires slaughter inspection of ostriches, emus, rheas, and migratory waterfowl.

There are two kinds of meat lockers, said Mamminga. "Official" establishments have a state inspector on hand before and after slaughter. A "custom" establishment does only private and in-house slaughtering. Meat at such a locker will have labels saying "not for sale," or "exempted poultry." To confuse things, however, these businesses may also buy and process inspected meat from an "official" establishment.

Registration at the annual meeting.

Cindy Madsen, Audubon, shared some of her tips for marketing chickens. She sees a wide range of quality at her locker. She sorts birds by size, packages them simply but cleanly, and tries to get them to her customers as quickly as possible. Cindy encouraged others entering the business to "know your costs."

Mike Mamminga also pointed out the need to track all costs and revenues. Options that bring a good price but only use part of the animal are not necessarily profitable. "Look at the *whole beef* or you'll lose your profit,' he cautioned.

Like Cindy Madsen, Robert and Mary Jane Recker sell by word of mouth. They ask $1.60/ hanging pound for their beef. While they pay for a "general cut-up," customers can pay for additional processing. The Reckers say they presently net about $0.25 per pound (of hanging carcass) above what they would get selling to a meat packer.

They plan to develop their own label and market frozen packages door-to-door. They can legally do that within Iowa because their locker at Frederika is a state-inspected facility.

If meat will not be sold out of state, there is no need to use a federally inspected facility, said Mamminga. Producers can develop their own label for product recognition. They should do this in cooperation with their locker, and his office must approve the label for accuracy.

In addition to the basic label requirements, "you can put anything on the label that's not false." "Speak to what you do," urged Mamminga. The information on the label should be concrete and verifiable.

Biological Controls for Iowa

participants: Joe Fitzgerald, John Obrycki, Kris Giles, Mark Roose (moderator)
video available

Joe Fitzgerald, at the New Melleray Abbey, did not have enough corn borers to justify a release of

the parasitic wasps. The wasps are released from small cardboard capsules scattered around the field; 500 wasps per capsule, and 100 capsules per acre. Even so, the neighbors who came to a spring orientation meeting at the monastery are still talking about the trial, says Joe.

Mark Roose and Kris Giles described the alfalfa weevil project. The weevil has naturally occurring enemies in a fungal disease and several parasitic wasps. Five or six days after a June rain, the fungus wipes out the weevil.

Giles, Roose, and Phil Specht, in McGregor, monitored the population and disease levels in the weevil, sampling regularly and raising some weevil larvae in test tubes. Because the fungus needs moisture, Roose and Specht left a strip of alfalfa uncut at the first harvest to act as an incubator for the fungus. See the research report in this newsletter.

The workshop discussion turned to other insect pests and other biocontrol techniques. Tom Wahl has grafted diseased stems of multiflora rose onto roses in a pasture, and the grafts have reportedly been successful. Plant pathologists are still studying the potential of this disease to spread to cultivated roses.

ISU entomologist John Obrycki described a new project to control corn borer through a microsporidim organism named Nosema (no-SEE-ma). PFI and Obrycki have received support for on-farm research with this biocontrol in 1996. Two new cooperators are needed to participate with this project.

What About an Off-Farm Job?

Panel members: Kathy Koether, Mark Bruns, Mike Reicherts, Joan Blundall (moderator)
video available

What are the pluses and minuses of working off the farm? Contrary to popular thought, our panel members noted more advantages, but didn't make light of the fact that working elsewhere changes farm and family dynamics. Joan Blundall shared a social/historical perspective of people considering off-farm employment as negative or as a weakness. In our current perspective, it is a fact of life for many, and may have both positive and negative aspects. Off-farm work may be a short- or long-term strategy to meet an individual's and the farm business needs. Panel members shared three different strategies for helping meet their personal and family goals.

Mark Bruns enjoys his work in a machine shop where, in addition to manufacturing, he provides training for developmentally disabled people. By cutting back on acres farmed, he finds rewards from both professions and no longer feels the competition with neighbors for more land. Relaxing the financial burden, also allows him to concentrate on improving the genetics in his ewe flock.

Kathy Koether loves the farm, but always wanted a teaching career. She has combined teaching and additional schooling with their family farming goals. Kathy shared that "her family has always supported her work," and that "training opportunities are out there; you only have to look to find them!"

Major changes in farm enterprises and farm management philosophy led Mike Reicherts to work part-time for another farmer, for what he considers a transition period. Mike stressed not to view life changes as negative. Change is stressful and alters how the farm and family operate, but for him has been a growing experience. This may not have been the path he would have chosen, but is making a positive experience of it.

Hoop House Hog Production

Participants: Mark Honeyman, Archie Kuntz, Laurie Connor, Vic Madsen (moderator)
video available, additional material available

Laurie Connor started the session reporting on her research in Manitoba, Canada, where she has compared hoop structures with conventional ones for grower-finisher pigs and dry sows. She said the first 7-14 days are a critical period for young pigs that enter the hoop system in winter. Because the group may not have the total body mass necessary to heat the space, temporary drop ceilings can be useful.

With temperatures just above zero, two dozen producers turned out for the pre-conference tour of the hoophouse hog unit at the ISU Rhodes Farm.

In general, though, humidity control is more important than temperature. In Iowa, the south end is typically open in winter except for an air barrier up to about 4-5 feet. The north end is open at the top in winter. This system *requires* bedding.

Canadian farmer Ron Floyd happened to be present at the workshop. It was he who originally imported the hoop system from Japan. The bedding-manure pack is removed only after the pigs leave for market.

Some farmers like to place a layer of ag lime between the ground and the bedding. It is commonly believed to suppress pathogens, and it provides a convenient marker when cleaning out the structure. Floyd estimates that a producer should allow about one half-hour per day for labor in the typical hoop system.

Mark Honeyman agreed that labor requirements are less than in a conventional barn. He said that while the Swedish system and other deep-bedding approaches are management-intensive, they do not require a lot of equipment or medications.

One of the problems of production agriculture, noted Honeyman, is that we build single-purpose buildings that last too long. Materials for a 35 × 70-foot hoop unit typically cost around $7,000.

Honeyman is directing research on hoophouse hog production at two ISU outlying research farms. He said he is less concerned about the wintertime performance of hoop systems than how well hogs on a manure pack will handle the typical hot, humid Midwestern summer.

Archie Kuntz, a hog producer from Brooklyn, Iowa and a dealer for a hoop manufacturer, said the buildings should be situated *outside* windbreaks for better air circulation. On his own farm he made a mister system for his hoop structure. He noted that, while in Canada hoop structures are oriented east-west, in the United States structures are north-south to minimize solar gain.

Keeping Track: Records and Decision Making

Panel members: Mary Dreier, Tom Frantzen, Dave Lubben, Mike Duffy and Larry Kallem (moderators)
video available, additional materials available

Though there are many views on how to make farm management decisions, our panel members agreed that business records are critical to aid that decision making. Speakers even took us a step further back in the decision-making process. "Don't even think about managing resources without a goal!" Tom Frantzen emphasized.

Two major record and decision making systems were described. Mary Dreier and Dave Lubben both use 'classical' accounting and business analysis for each enterprise on the farm. Both have worked for many years with the Iowa Farm Business Association (IFBA) to analyze their records.

This nonprofit, farmer-run organization provides record-keeping guidelines, computer software or paper entry systems, and analysis services to cooperating farmers. Dave and Mary agree that the ability to compare their operations with other Iowa farms has helped them feel confident about their businesses. Advisors within the IFBA have also been helpful in focussing on goal setting for their clients.

Tom Frantzen and his family have been implementing Holistic Resource Management (HRM) on their farm for several years. This management philosophy may be unfamiliar. It is based, in part,

Mike Duffy talks to PFI annual meeting attendees.

on ecological principles of maximizing use of sunlight, the water cycle, and the nutrient cycle to make a living from your land. Goals are set to improve or maintain the resource manager's quality of life. Decisions then are based on whether or not farm management changes move you toward those goals. More emphasis is put on planning and replanning than with other systems.

There are several tools that can be to used to help manage the farm business. First must come the commitment to improve on your current system and devote time to the effort.

Farming in Stories

Presenter: Michael Cotter
Summary - Gary Huber

Michael Cotter, a storyteller and farmer from Austin, Minnesota, began by telling the first story he ever did in public - a story about a killdeer mom trying to protect its nest from destruction as Michael tilled a field on his farm.

He went on to describe how he began storytelling - how it was something he felt strongly about wanting to do, but at the same time was something he was afraid of trying. "The hardest thing to do is get up and tell a story," he noted.

He continued, "The story is in you, in your experiences, but the magic of storytelling is in the listening. If you could see your faces, you would know this truth." Michael then asked people to describe some of their experiences as he had done with the killdeer story. Various participants offered stories, many related to birds they remembered in their youth and on their farms.

He continued by saying, "Another thing that is needed is a safe place to be able to tell your story. Your memories trigger the stories, and with a safe place you are free to get into your memories and value them." He went on to note that stories can't be told without a community because "its the people that make telling stories possible."

Again various participants offered some stories, many of which came from their memories of aunts and uncles during their childhoods. Michael offered that it is important to write down the memories that are triggered by the stories of others so that these can be offered as your own.

Other stories from the participants followed as people present began to feel more at ease. Images were offered from peoples' pasts, many of them vivid and moving testaments to ordinary peoples' experiences. Michael ended the session by noting, "The telling of stories heal, and we all have healing to do in our lives." ❦

Dave Lubben

by E. Anne Larson

(Editors' note: This is an excerpt of an article that appeared in the Leopold Center for Sustainable Agriculture's 1994 Annual Report. Dave has served as an ex officio member of the Center's Board of Directors.)

You know the minute you enter Dave Lubben's quarter-mile lane north of Monticello that he pays attention to details: the barn and outbuildings are well-repaired; the cattle lot fences gleam white in the late afternoon sun; the farm yard is groomed to a tee.

As Dave talks about his methodical approach to farming, it's clear that he leaves little to chance. He's an advocate of using indicators that will help

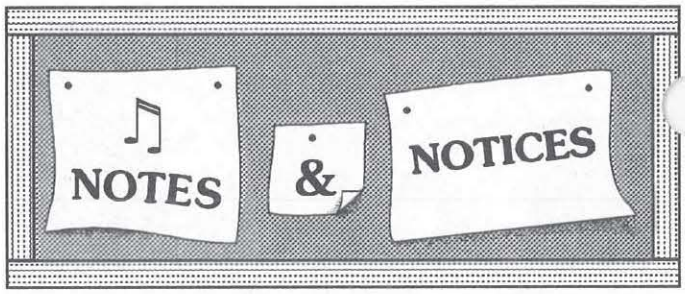
Dave Lubben, the new President of Practical Farmers of Iowa, at a field day on his farm.

him manage the 1,400-acre grain and livestock farm that he co-owns with his father and brother.

He refers to the three-ring binder he carries with him as his "bible." In it, Dave maintains information on operational goals, historic records, and financial data, as well as a performance evaluation. Production costs are figured to the penny. Plans to market grain are laid out in detail. Before the crop is even in the ground, Dave knows when, how much, and at what price it must be sold to ensure a profit.

A 1979 ISU farm operations graduate, Dave continues his education by reading agricultural and economic journals, accessing computer databanks on the markets, and talking with financial advisors. Since 1982, he has been part of a marketing club that meets monthly to share knowledge of market conditions.

His service on a Monticello bank's board of directors has cemented his belief that to succeed, the farmer has to have a firm grip on economic realities. In the mid '80s, Dave thought that banks were largely to blame for the difficulties farmers faced. Over time, however, he has come to believe that producers share responsibility for farm failure. In the 80's, he resolved that "I didn't want it to ever happen to me. And if it did happen, I wanted to know it before my banker did!"



New PFI Officers Selected

At the winter PFI meeting, the membership unanimously approved changes to the PFI articles of incorporation that provide for two board members from each of the five districts. Also approved was a provision for ballots by mail.

At the district caucuses, all the former associate board members were elected as full board members. In addition, two new PFI members joined the board: Dan Specht, from McGregor, and Barney Bahrenfus, from Grinnell.

In the board meeting that followed, Dave Lubben, of Monticello, was elected PFI President. He succeeds Vic Madsen, who has served the past three years. Thanks, Vic. Congratulations, Dave!

District Events

Southeast District Co-sponsors Meeting

On Thursday, March 7, the Southeast District of PFI and the Southeast Iowa Research Association will co-sponsor a meeting in Montgomery Hall at the Johnson County Fairgrounds.

The Southeast Iowa Research Association owns the ISU research farm at Crawfordsville, where ISU agronomist Antonio Mallarino is researching fertilizer placement and rates for reduced tillage situations.

The program will begin at 10:00 am and includes a variety of research reports and discussion.

A lunch will be available for purchase. For more information, contact Jeff Olson, 319-257-6967.

Northwest District Hosts Energy Speaker March 9

The northwest district will get together at the Family Table Restaurant, in Cherokee Saturday, March 9, for supper and a program. The Family Table is on the west side of Highway 59, on the north side of town. Supper is on your own at 6:00 pm, with the program at 7:00.

The program will be a presentation and discussion led by Lara Levison, who is a field representative in the energy program of the Union of Concerned Scientists. The Union recently published *Powering the Midwest*, the report of a regional study of the potential of solar, wind, and biomass energy. One conclusion of the study, according to PFI director Paul Mugge, is that the Midwest could become an energy exporter.

♫ SARE Announces Producer-Initiated Sustainable Agriculture Grants

The North Central Region of the USDA Sustainable Agriculture Research and Education (SARE) program has allocated about $200,000 for the Producer-Initiated Sustainable Agriculture Grants Program.

Competitive grants of up to $5,000 are available for individual farmers and ranchers and up to $10,000 for groups of farmers and ranchers who are interested in studying sustainable agriculture production and marketing. The grant period will begin in mid-fall 1996 when funds become available and can extend 12-18 months.

During the first four years of this program, 127 grants were awarded to producers studying a variety of topics. These ranged from rotational grazing and livestock systems to crop production systems, urban and rural waste management, weed control, alternative uses for CRP land, biological weed and pest control, organic farming, marketing, quality of life, water quality and soil conservation.

Grants have been used to conduct on-farm research trials, sponsor educational programs and field days, develop new technologies, and to create or modify equipment. Projects that include a youth component are particularly welcome.

The application deadline is May 1, 1996. For more information and application materials, contact the PFI coordinators (515-294-1923) or the North Central Regional Office of SARE (402-472-7081).

♫ Iowa Farm Leaders of the Year Award to Thompsons

The Des Moines Sunday Register announced on Feb. 11 that Richard and Sharon Thompson have been selected the Des Moines Register's Iowa Farm Leaders of the Year. It is the first time a couple has received the award.

The article in the Register, written by Jerry Perkins, traces the Thompsons' own personal, lifelong journey toward sustainability. After more than a decade of farming, they reached a spiritual turning point that has led to changes both in their lives and in the farm. Dick credits Sharon with being a source of strength and persistence in the years that their farming seemed to go against all norms.

The Register piece also describes the birth of Practical Farmers of Iowa and the development of the cooperative relationship with Iowa State University. With illustrative quotes from others involved in the collaboration, the article points out benefits that this relationship has produced for agriculture in Iowa.

♫ Wanted! Your Input!

Practical Farmers of Iowa isn't much without the energy and guidance of people like you. Several times in the past weeks situations have come up that fairy cry out for member input. Take a look at these "opportunities" and decide if you might have something to offer.

Master Librarian Wanted!

PFI has five district libraries. A year ago a master list of the books and video tapes was put on the computer. Districts have acquired new materials since then, but it is a well-kept secret. Districts don't know what is in the libraries of other districts, and PFI members are generally not aware of the new titles available. We need a master librarian to keep up a master list so people will know what is available and where they can find it. Maybe that person could also organize some book reports for the newsletter. If we don't know *what* it is or *where* it is, we probably aren't going to read it!

Contact one of your board members or the PFI coordinators if you have an interest. The old list is available for updating on a computer file, if that would be helpful.

Answer Panel Needs a Name, Questions!

There's a lot of information flying around today. But it isn't always easy to use. What's the first thing you do when you have a question about farming? You probably get an opinion or two from other people you respect. That is the idea behind a new feature that will be starting in this newsletter. But we don't know what to call it. Any ideas?

Four PFI members have agreed to be part of this panel to respond to your questions (or comments) about farming. Farming? That's a pretty broad topic. But there is broad experience represented on the panel.

Ron Rosmann, a former PFI president, runs a diversified operation near Harlan with his wife Maria. They have hogs, rotationally graze beef cattle (cow-calf), use ridge tillage, and are in the transition to organic certification. 1222 Ironwood Rd., Harlan, IA 51537-4102. 712-627-4653.

Roger Schlitter is a loan officer in Osage and a member of a *Shared Visions* community group. 3 Boulder Rd., Mason City, IA 50401. 515-423-3081.

Margaret Smith farms with husband Doug Alert in a new farm operation near Hampton. They are building up their cow herd and fixing up the farmstead. Margaret is helping to organize the PFI Women's Winter Gathering set for March. She also works as an agronomist at the USDA National Soil Tilth Laboratory, in Ames. 972 110th St., Hampton, IA 50441. 515-456-4328.

Tom Frantzen and his wife Irene raise hogs, cattle, turkeys, and a diversity of crops in northeast Iowa. Another past president of PFI, Tom has spoken widely to groups of farmers and scientists about systems thinking, our relationship to information and information providers, and working relationships for a sustainable agriculture, community, and quality of life. 1155 Jasper Ave., New Hampton, IA 50659. 515-364-6426.

These folks would really appreciate hearing from some other PFI members with questions or comments. If they need to, they'll tap the resources of Iowa State University or other institutions for information. But these are people who have their own expertise and their own perspectives from working and living in the country. Don't disappoint them, drop a line!

Name That Fund! PFI Begins Support Campaign

As announced at the annual meeting, Practical Farmers of Iowa officers are formulating a long-term plan for the financial stability of the organization. Grant-based funding can go through ups and downs over time, and PFI needs to establish a "financial flywheel" that will sustain the organization's work through the years.

"Flywheel," well, maybe that's not the name to attach to this effort. Can you think of a more appropriate name? The Nebraska-based Center for Rural Affairs has a fund they call "The Granary." What would a fund be called that supported sustainable agriculture in Iowa? The floor is open for nominations!

Whatever it is to be called, the fund received its first major contribution just as the concept was being developed. Ann Lennartz is a PFI member in the Seattle, Washington area who is associated with a community-supported agriculture effort there. In December she wrote PFI a $500 check – and arranged for a matching contribution from her employer!

♫ Volunteer Farm Tour Guides

Volunteer farm tour guides from the Waterloo area are needed for the summer. They need to be knowledgeable about farming. Contact Suzanne Lee at *Solos and Smokestacks*, 319-234-4567.

♫ *Expanding the Toolbox* Conference Set for NE Iowa March 8

"Expanding the Toolbox: Farming Systems and Learning Approaches" is a one-day conference to be held March 8, 1996, at Northeast Iowa Community College, in Calmar. This event will bring together success stories on enterprises for family farm agriculture and on teamwork approaches for non-farmer agricultural professionals. The meeting is designed for producers, Extension and Natural Resource Conservation Service personnel, and others from the tri-state area. A follow-up three-state bus tour is scheduled for summer.

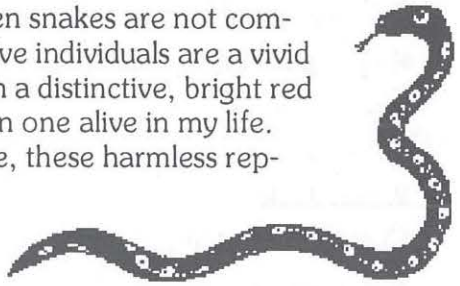
Sessions, panels and workshops will feature planned grazing for dairy and for beef, low-investment hog production systems, and the HRM and "strategic management" approaches to decision-making. Presenters will include producers and agricultural information providers who have joined to implement these practices. Examples of team-building, facilitation, and other empowerment approaches will be presented and discussed. The "decision case" model will be explored as a tool for holistic problem solving.

Preregistration by Feb. 27 costs $20. Thereafter registration costs $30. To register contact Northeast Iowa Community College, 800-728-2256, ext. 219. For additional meeting information contact Rick Exner, 515-294-1923 ❦

THERE'S A SNAKE IN MY PASTURE!

Ed Broders, Stockton

Rotational graziers have long known of the practice's benefits for wildlife. On my family's farm in Muscatine County, rotational grazing has done just that. It has proved especially beneficial to a rare species of snake.



Smooth green snakes are not common in Iowa. Live individuals are a vivid green color, with a distinctive, bright red tongue. I've seen one alive in my life. Small and elusive, these harmless reptiles are typically found in wet or marshy areas, where they feed on insects.

The smooth green snake is considered an "indicator species" in prairie remnants. Its demise is attributed to habitat loss and pesticide use. The snakes are not well studied because they are difficult to catch and do not survive in captivity. Fewer than ten populations are known in Iowa, all of them in the eastern half of the state.

The specimen I found last fall was only the third I've ever seen. What's interesting is that it turned up in rotated pasture, about 600 feet from the road ditch where I saw the previous two. I can't draw any firm conclusions, but it seems reasonable that rotational grazing has expanded the habit for this rare snake. That should encourage the snake population.

A mixed seeding of legumes and cool season grasses cannot match the native prairie for biodiversity and prime snake habitat. For the moment, however, it may afford the best balance between preservation and agricultural production. ❦

HOSTING INTERNATIONAL VISITORS ON IOWA FARMS

Kamyar Enshayan, Cedar Falls

Even Iowans often refer to Iowa as a place that needs to have more cultural diversity. However, our region *is* diverse and to see that you only have to look. Every year, from March to June, millions of international visitors from Central and South America and the Gulf of Mexico region, visit rural Iowa and some even settle down.

I have met many right here in Cedar Falls and surrounding areas:

Blue-winged teal
Ring-necked duck
Greater Scaup
Bufflehead
Wood duck
Common merganser
American coot
Northern shoveler
Yellow-headed blackbird
Belted kingfisher
Osprey
White pelican

Pelicans? In Iowa? Yes, white pelicans with a nine-and-a-half- foot wingspread. And to see all these water birds, all you need is a pair of binoculars, a field guide to identify what you see, and being out there to look. Depending on what kind of habitat you visit, you can see many species of migrating birds who enrich our spring with their songs, colors and presence.

Each year, from April through May, during my one-mile walk to work every day, I have seen numerous birds whose winter home are the rainforests of Central and South America. What an amazing treat. Here is a partial list of birds I saw last year in Cedar Falls as I walked to work:

Golden-crowned kinglet
Brown thrasher
Grey catbird
Cedar waxwing
Yellow-rumped warbler
Black-and-white warbler
Magnolia warbler
Cape May warbler
Chestnut-sided warbler
Blackburnian warbler
American redstart
Yellow warbler
Common yellow throat
Northern oriole
Rose-breasted grosbeak
Rufous-sided towhee

The spectacular colors and the magic of seeing these birds live cannot be reproduced in a field guide. You've got to see these awesome creatures and you, as I always do, will know you are among miraculous things in heaven.

I have been lucky to see several bobolinks and dickcissels who nest in prairies, pastures, hay fields and meadows. I know of several PFI farmers who are delighted to see these birds on their farms and are creating more habitat for these international visitors to convene here.

Whooping cranes used to nest in Iowa. Iowa was a richer place and due mostly to habitat destruction, what we now see of wildlife in Iowa is a tiny fraction of what was here. The last year whooping cranes nested here in Black Hawk County was 1871, and we all have been slightly impoverished ever since. (To find out what else we are missing out on in Iowa, read *A Country So Full of Game: the Story of Wildlife in Iowa*, by James Dinsmore).

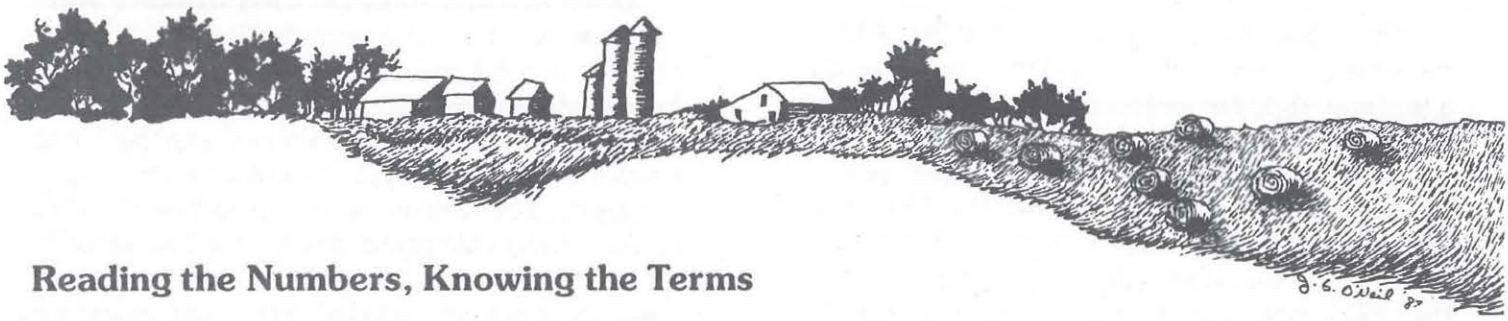
I can think of at least two ways we can greet our international visitors and nurture a genuine cultural diversity here:

① Go out there and meet them. Take your binoculars and field guide and enjoy.

② Build convention centers! Not the kind Chambers of Commerce usually spend $150 million on, but the kind any land owner can rehabilitate, restore, or reestablish with some investment of time, creativity and forethought. I am talking about marshy areas, prairie potholes, woodlots, riparian habitats, prairies, hay fields, forests and all the other biotic convention centers that we desperately need in Iowa.

Many farm families are demonstrating that these habitats enhance their farms and their lives and are a necessary part of their farm landscape. That is "value-added" in the truest sense. ❦

PFI ON-FARM TRIAL RESULTS, 1995



Reading the Numbers, Knowing the Terms

Valid and reliable farmer-generated information is a cornerstone of Practical Farmers of Iowa. Consequently, PFI has worked to develop practical methods that safeguard the accuracy and credibility of that information. PFI cooperators use methods that allow statistical analysis of their on-farm trials. Chief among these are: 1) "replication," and 2) "randomization." (See Figure 2., a typical PFI trial layout.) The farming practices compared in a trial are repeated, or "replicated," *at least six times* across the field. Thus trial results do not depend on a single comparison only, but on six or more. The order of the practices, or "treatments," in each pair is chosen with a flip of the coin. This "randomization" is necessary to avoid unintentional bias. PFI on-farm trials have been recognized for their statistical reliability. So, while PFI cooperators don't have all the answers, they do have a tool for working toward those answers.

When you see the outcome of a PFI trial, you also see a statistical indication of how seriously to take those results. The following information should help you to understand the reports of the trials contained in this report. The symbol "*" shows that there was a "statistically significant" difference between treatments; that is, one that probably did not occur just by chance. We require ourselves to be 95% sure before we declare a significant difference. If, instead of a "*," there is a "N.S.," you know the difference was "not significant."

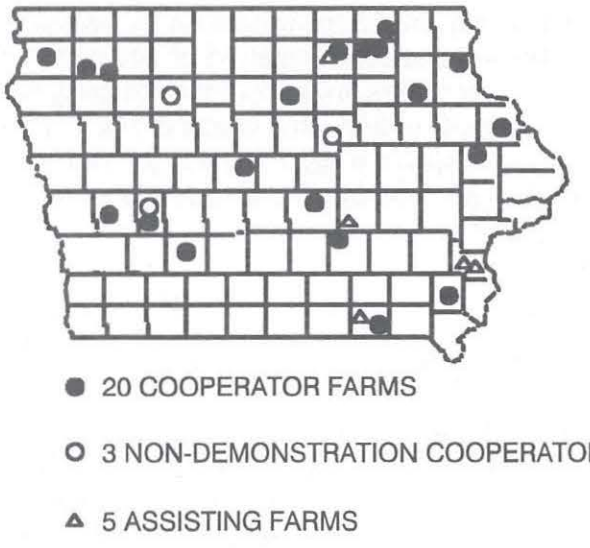


Figure 1. PFI on-farm research sites in 1995.

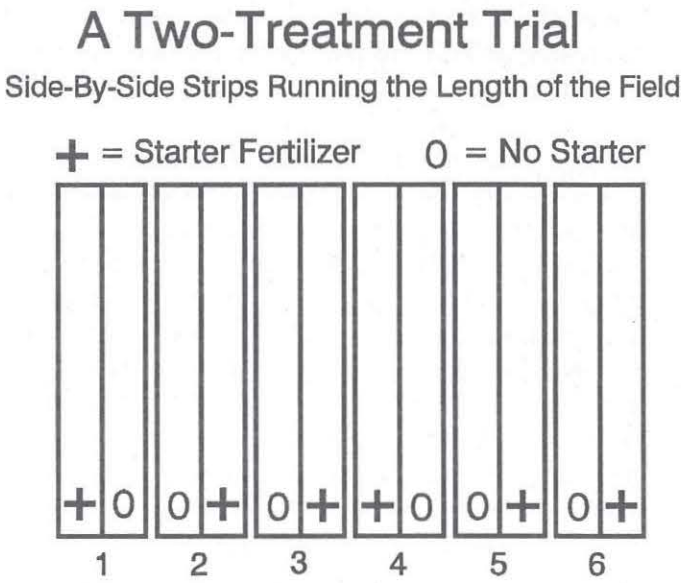


Figure 2. A typical two-treatment PFI trial.

Dollar amounts shown in parentheses ($) are negative numbers.

There is a handy "yardstick" called the "*LSD*," or "least significant difference," that can be used in a trial with only two practices or treatments. If the difference between the two treatments is greater than the LSD, then the difference is significant. You will see in the tables that when the difference between two practices is, for example, 5 bushels (*or minus* 5 bushels, depending on the arithmetic), and the LSD is only, say, 3 bushels, then there is a "*" indicating a significant difference.

The LSD doesn't work well in trials with more than two treatments. In those cases, *letters* are added to show whether results are statistically different from each other. (We usually use something called a Duncan multiple range grouping.) The highest yield or weed count in a trial will have a letter "a" beside it. A number with a "b" next to it is significantly different from one with an "a," but *neither* is statistically different from a number bearing an "ab." A third treatment might produce a number with a "c" (or it might not), and so on.

Average 1995 statewide prices for inputs were assumed in calculating the economics of these trials. Average fixed and variable costs and time requirements were also used. These can vary greatly from farm to farm, of course. The calculations use 1995 prices of $2.85 per bushel for corn, $6.25 for soybeans, and $1.50 per bushel for oats. Labor was charged at $8.00 per hour.

Some tables show both a "*treatment cost*" (which includes relevant costs, but not the total cost of production) and "*treatment benefit*." The treatment benefit is the *relative* advantage of a practice compared to either: 1) the least profitable treatment in that trial; or 2) a "check" treatment of zero-rate or zero-disturbance. The comparison treatment is assigned a treatment benefit of $0. Other treatments can show a dollar benefit either greater or lee than that.

If there are no significant yield differences in the trial, treatment benefit is calculated solely from input costs. If the yield of a treatment is significantly different from that of the comparison treatment, then that difference in bushels is also taken into account to calculate treatment benefit for the more profitable practice.

Dollar amounts shown in parentheses ($) are *negative* numbers. A treatment "benefit" that is a negative number indicates a relative *loss*. The highest-yielding practice doesn't always have the greatest treatment benefit. You will see that sometimes the additional input costs of a practice outweighs its greater gross return. And in some trials, the least profitable practice is not the lowest yielding. In these cases a "Crop Over Treatment Cost" dollar value may be included in the table to show the absolute net value of each treatment. This parameter reflects yield differences whether or not they were statistically significant.

Producers are encouraged to carry out their own trials to find what works in their operations.

Here is one more thing to be aware of. Fertilizer shown with dashes between the numbers (18-46-0) means *percent* by weight of nitrogen, phosphate, and potash in the product. Fertilizer shown with plus signs (18+46+0) indicates *pounds per acre* of those nutrients in an application.

The results that appear here imply neither endorsement nor condemnation of any particular product. Producers are encouraged to carry out their own trials to find what works in *their* operations. In reports of trials that involve proprietary products, brand names are included for purpose of information.

"A/B" Trials

Many on-farm trials are of a straightforward "A versus B" type. These trials, which are easy to design and analyze, correspond to the typical experimental question "Is alternative 'B' better than, worse than, or the same as customary prac-

tice 'A'?" This approach can be used to evaluate individual practices or entire systems of practices. Many of the following 1995 trials are "A/B" experiments.

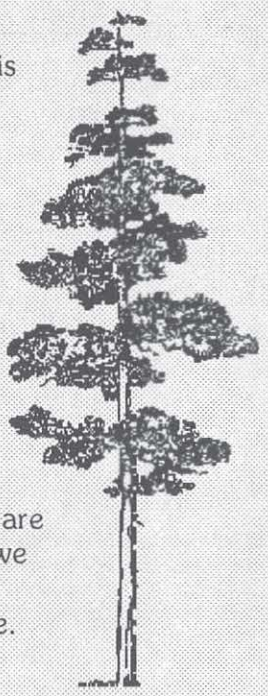
Berseem Clover Before Corn

PFI farmers were among the first to introduce berseem clover into their cropping systems. Cooperators are still examining this annual legume for its production and compatibility. Tom and Irene Frantzen, Alta Vista, have compared berseem and red clover for the last two years (Table 1). Oats has yielded better when seeded with red clover than with berseem, but the fast-growing berseem has made more straw when the oat/legume mix is baled. There was also more berseem regrowth after mowing in 1994.

The 1995 corn yielded nearly six bushels better after berseem than after red clover. But the late spring soil nitrate test showed plentiful nitrogen across the field. Tom attributes the advantage to planting conditions, explaining that the berseem left the soil in better shape than did the red clover. (Both treatments were disked before planting.) Many people have remarked that in the wet spring of 1995, planting conditions made all the difference to the success of a crop.

Trees for Biodiversity

Matt and Diana Stewart, Oelwein



In addition to working on rotational grazing, we have started a demonstration that is directed toward restoring ecological biodiversity to our farm. Insecticides were not used on the cows for fly control, and certain areas of the farm are being used to encourage wildlife nesting and cover. With help from Carl Mize, ISU Forestry, 50 silver maples were planted in May in an 80' × 500' fenced-off "future forest" area. More plantings are planned in the next years as we decide what trees or shrubs might attract desirable wildlife. Twenty Camden poplars and twenty Austree willows were planted in another area to experiment with fast growing trees and to establish a cutting orchard for future use. Dr. Laura Jackson has convinced us to stick with native species, thus the use of poplars and willows is presently considered temporary.

Using the Late Spring Test

Paul and Karen Mugge, Sutherland, looked at the value for corn of liquid hog manure compared to purchased nitrogen. In the spring following soybeans, they knifed 2,500 gallons into alternate row middles, avoiding wheel tracks. Paul estimates that application to have been 100 pounds worth of total nitrogen. In the comparison treatment, they relied on the late spring test for a rate to sidedress 28-percent N.

When Paul took the late spring soil nitrate test on June 7, results indicated only 14 ppm (parts per million) nitrate where liquid manure was applied. That didn't seem to make sense. ISU agronomist Fred Blackmer suggested that, since the test would still be valid until the corn reached one foot in

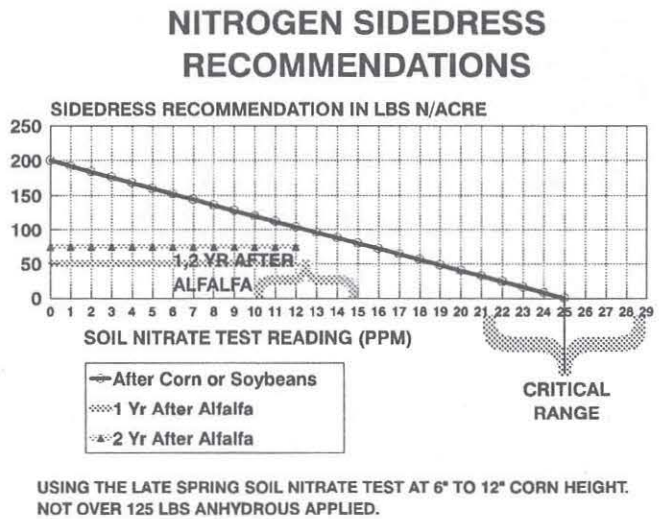


Figure 3. Nitrogen sidedress recommendations for the late spring soil nitrate test for corn.

Table 1. "A/B" FERTILITY TRIALS

COOPERATOR/ CROP	TREATMENT "A"			TREATMENT "B"
	DESCRIPTION	YIELD (bu.)	TRT COST	DESCRIPTION
FRANTZEN/ CORN	CORN (1995) AFTER 1994 BERSEEM CLOVER	150.6	$21.00	CORN AFTER RED CLOVER
	OATS W. BERSEEM IN 1994	64		OATS W. RED CLOVER IN 1994
	OATS/BERSEEM STRAW IN 1994	30.0	BALES/ ACRE	OATS/RED CLOVER STRAW IN 1994
	BERSEEM REGROWTH IN 1994 (REMOVED)	1.8	TONS/ ACRE	RED CLOVER REGROWTH IN 1994 (REMOVED)
FRANTZEN/ OATS	OATS W. BERSEEM IN 1995	90.2	$20.25	OATS W. RED CLOVER IN 1995
	OATS/BERSEEM STRAW IN 1995	45	BALES/ ACRE	OATS/RED CLOVER STRAW IN 1995
MUGGE/ CORN	PURCHASED N ONLY (TOTAL OF 117 LBS N)	146.4	$21.90	LIQUID HOG MANURE (100 LBS N) (20 LBS 28% N AT PLANTING)
ROSMANN/ CORN	PURCHASED CHICKEN MANURE	120.5	$32.07	COMPOSTED HOG MANURE
STONECYPHER/ CORN	60 LBS 32% N SIDEDRESS	167.6	$13.38	120 LBS 32% N SIDEDRESS
WURPTS/ SOYBEANS	BIOLOGICAL FERTILITY PROGRAM	52.6	$8.15	ISU FERTILIZER RECOMMENDATIONS
WURPTS/ CORN	BIOLOGICAL FERTILITY PROGRAM	139.2	$49.61	ISU FERTILIZER RECOMMENDATIONS

height, Paul should sample again in a few days. On June 19, the test showed adequate nitrogen for the crop.

Leaf samples Paul took mid-season also indicated no shortage of N in either the manure or the purchased N treatment. The corn receiving liquid manure yielded somewhat less on average, but not enough so that random chance could be discounted. But Paul also took end-of-season stalk samples for nitrate analysis, and these suggest that the manured corn, in fact, ran out of N. The target

"A/B" FERTILITY TRIALS

TRT "B"		DIFFERENCE				COMMENT
YIELD (bu.)	TRT COST	YIELD DIFF.	YLD LSD (bu.)	YLD SIG.	$ BENEFIT OF TRT "A"	
144.7	$8.00	5.9	*	2.7	$13.00	CORN PLANTING CONDITIONS WERE MUCH BETTER IN 1995 AFTER 1994 BERSEEM. LATE SPRING SOIL NO3 = 32 PPM (HIGH). 4 REPS ONLY. BOTH TREATMENTS RECEIVED 146 LBS N. DOUBLE ROW CORN BUT NOT HIGH POPULATION
75						
24	BALES/ ACRE					
0.75	TONS/ ACRE					
95.7	$8.00	-5.5	*	4.6	($6.97)	$ BENEFIT SHOWN INCLUDES OAT YIELD, STRAW, AND SEED COST
37	BALES/ ACRE	7.8	*	4.9	$9.24	
142.2	$4.87	4.2	N.S.	6.5	($17.03)	STALK NITRATE IN MANURED CORN LOW: 119 PPM. 1,300 PPM IN PURCHASED N CORN
121.5	$16.42	-1.0	N.S.	6.3	($15.65)	CHICKEN MANURE (44+54+33), HOG COMPOST (14+14+19). FOLLOWING SOYBEANS
178.1	$26.76	-10.6	*	9.0	($16.82)	LATE SPRING NO3: 11 PPM, STALK NITRATE 173 PPM (60 LBS), 447 PPM (120 LBS)
51.7	$0.00	0.9	N.S.	2.0	($8.15)	
138.3	$26.76	1.0	N.S.	7.1	($22.85)	

range for stalks is 700-2,000 ppm nitrate. The corn that received only purchased N averaged 1,300 ppm, while the manured corn showed only about 120 ppm! Maybe the first results from the late spring test were the right results!

With the concentrated carbon source, it is possible for the subsurface band to become anaerobic to the extent that significant denitrification takes place.

Another possibility suggested by Blackmer relates to incorporating manure in concentrated bands. With the concentrated carbon source, it is possible for the subsurface band to become anaerobic to the extent that significant denitrification takes place. While Blackmer emphasizes we don't yet know the precise conditions in which this would occur, he points out that it would be a case of more manure amounting to *less* crop-available N.

Ray and Marj Stonecypher, Floyd, also used the late spring soil nitrate test in their comparison of two sidedress N rates (Table 1). And like Paul Mugge, Ray Stonecypher took the late spring test twice. On June 19 the test yielded 14-15 ppm nitrate. A more thorough sampling on June 21 gave 11 ppm. In some years past, Ray has undercut the recommendations from the test without a loss in corn yield. Most of those fields, however, have a history of some manure. This particular field has no manure history, and that may be reason to use the late spring test more conservatively. According to ISU agronomist Alfred Blackmer, guidelines for using the late spring test with manured soils should be released next spring, and they will call for less nitrogen.

The ISU Extension bulletin *Soil Testing to Optimize Nitrogen Management for Corn* (Pm-1521) suggests setting a critical level of 25 ppm and sidedressing 8 pounds of N for every ppm below that in the sample (Figure 3). Using Ray's example: $(25 - 11) \times 8 = 112$ lbs N. Ray's low sidedress rate, 60 pounds N per acre, would be below the guidelines even if a critical level of only 21 ppm were used. The high rate treatment, 120 pounds N sidedressed, was "in the ball park."

Like the Mugges, Ray and Marj discovered low levels of nitrate in the corn stalk at the end of the season. The high rate treatment averaged about 450 ppm, and the low rate treatment averaged about 170 ppm. While results below the 700-2,000 target range do not definitely mean the crop was short of N, the numbers show that none of the corn had excess nitrogen left at the end of the season. This is especially true for the corn that received the 60 pound sidedress. It yielded significantly less than the corn that received 120 pounds.

The 120-pound N corn, with a stalk nitrate of 450 ppm, is in the "marginal zone," as described by soil scientist Blackmer. Between 250 and 700 ppm, "producers should not be concerned," says Blackmer, but they should set their target for 700-2,000 ppm. The 10.6 bushel difference shows that in this particular trial there was a strong response to N between the 60 and 120 pound N rates.

Purchased Manure

Ron and Maria Rosmann, Harlan, are moving their farm toward organic production. They compared their own composted hog manure (at a total rate of 14+14+19) to purchased chicken manure (44+54+33) on a field with very high soil test potassium and soil phosphorus testing in the low range (Table 1). Leaf tissue samples taken at silking showed no significant differences between the two practices for any of the major nutrients. At the end of the season the yields were almost the same. Taking into account a $3 per ton charge for making the compost, the economics of the trial still favored the home-composted hog manure by $15.65 per acre.

Tom and Irene Frantzen, Alta Vista, also evaluated an approved organic fertilizer, a pelleted turkey manure marketed under the brand name Sustane® and containing approximately 4-6-4 nutrient value (Table 2). They compared 225 pounds and 375 pounds of Sustane, a zero check treatment, and starter fertilizer (3+8+50). All the treatments yielded similarly, so the zero-rate check represented the most profitable practice.

Biologicals

John and Rosie Wurpts, Ogden, are PFI members who have used *Sustainable Projects* grants to carry out a long term comparison of fertility management systems. Biological amendments marketed by Agrienergy, Inc. and recommended by a consultant have been compared to fertilization practices based on soil tests and ISU Extension recommendations. Input costs have been lower in the ISU system because, based on soil testing, usually only nitrogen has been recommended.

Rotational Grazing at Neely-Kinyon

The Neely-Kinyon Farm, near Greenfield, began rotational grazing in 1995 with 30-35 dairy heifers on 37 acres. A goal is to evaluate the economics of raising replacement dairy heifers on rotationally grazed pasture in southwest Iowa. Money was spent on permanent fencing and a water system. Additionally, the pasture was seeded with red clover and birdsfoot trefoil, and 104 pounds per acre of triple superphosphate was applied. The stock were in the field from May through August, and weights were taken monthly. ISU animal scientists Bill Wunder and Jim Russell supervised the data collection.

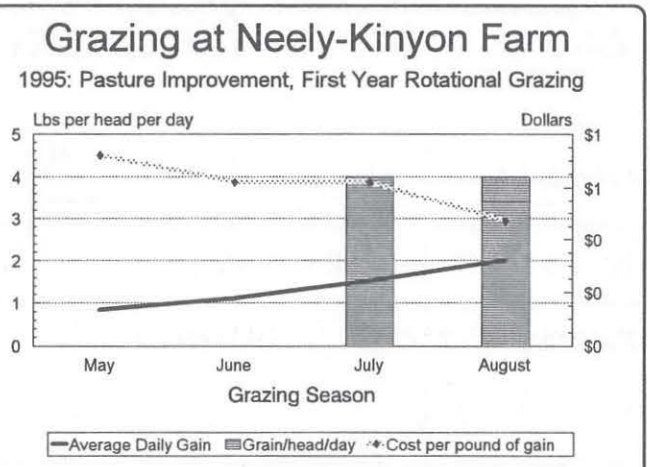


Figure 4. Gain, cost, and grain fed to dairy heifers at Neely-Kinyon farm.

The graph shows average daily gain (ADG) and cost per pound of gain for the four months of grazing. Instead of dipping in late summer, ADG continued to climb throughout the season. Bill Wunder suggests that this was, in part, a benefit of the legume seeding and fertilization. Jim Russell has an additional factor in mind.

Russell kept track of daily forage consumption using a sward stick. He says that the heifers consumed about 33 pounds of forage dry matter per head each day early in the season. In July, when each cow began to receive 4 pounds of grain a day, forage intake went down to around 28 pounds per day, but total energy intake remained relatively constant. Crude protein intake didn't change much either, but Russell figures that the amount of protein escaping degradation in the rumen – by-pass protein – nearly doubled. It is the by-pass protein that is used by the cow.

Forage protein, says Russell, is 90 percent degraded by bacteria in the rumen. Protein in hay is about 80 percent degraded. Roughly 60 percent of soybean protein is degraded. Russell thinks that next year ADG could be maintained by feeding as little as a pound of corn gluten or bloodmeal, whose protein is about 50 percent available to the animal. Jim Russell's team is also analyzing the bypass protein in berseem clover. Berseem, like birdsfoot trefoil, is high in tannins that prevent bacterial breakdown and probably make it a good source of by-pass protein.

Based on 1995 input costs, the ISU recommendations were favored by $8.15 in soybeans and $22.85 in corn (Table 1). In the five years that these replicated trials have been continued, the only significant yield difference was due to a 1991 weed problem in corn in the biological system. The average economic benefit of the ISU recommendations compared to the biological ones has been $26.63 in corn and $20.69 in soybeans.

The Neely-Kinyon Farm, in Greenfield, evaluated ACA, a zinc ammonium acetate additive that in very small amounts has sometimes increased corn N uptake (Table 2). The three treatments were: starter fertilizer, starter-plus-ACA, and a check treatment with neither ACA nor starter. Midseason leaf tissue samples showed no difference among the three practices in nitrogen, phosphorus or potassium, although leaves in the ACA treatment were lower in sulfur. The three yields were not significantly different, so the economic advantage went to the no-fertilizer control treatment.

Multiple Treatment Trials

Sometimes a simple A/B trial won't answer the question. In comparing two rates or placement methods of fertilizer, for example, it is often necessary to have a third, "check" treatment of zero fertilizer to know whether fertilizer was needed at all. Sometimes a producer will want to evaluate two or more factors (say, placement and timing), each at

Table 2. MULTIPLE-TREATMENT FERTILITY TRIALS

				TREATMENT "A"				
COOPERATOR	CROP	PREVIOUS CROP	YIELD SIGNIFI-CANCE	DESCRIPTION	YIELD (bu. or T)	STAT.	TRT COSTS	$ BENEFIT
BAUER	SOYBEAN	CORN	*	DEEP BAND 0+55+50	50.2	a	$23.24	($23.24)
DAVIDSON	CORN	SOYBEAN	*	FALL DEEP DRY BAND 8+20+40	127.8	a	$18.49	$1.85
EKSTRAND	CORN	SOYBEAN	*	FALL DEEP BAND 32+80+70	125.4	a	$40.75	$27.17
FRANTZEN	CORN	SOYBEAN	N.S.	225 LBS "SUSTANE"/ACRE	147.183	a	$29.25	($29.25)
NEELY - KINYON	CORN	CORN	N.S.	ACA+STARTER	84.1	a	$22.42	($22.42)

two or more levels (say, rates of fertilizer). Many of the following trials involve more than two treatments. The shading in the tables helps keep track of which lines belong in which trial.

Deep Banding

Many agronomists believe that fertilizer placement can be important in reduced tillage systems like no-till and ridge-till. Some ridge-tillers are placing fertilizer bands 5-6 inches deep, attempting to "take the fertility to the plant." In each of the following four trials, deep banding had a significant yield effect, but in only two did the practice pay for itself.

Ted and Donna Bauer, Audubon, compared a fall deep band of 0+55+50 to a fall broadcast treatment at the same rate (Table 2). The soil in this western Iowa field tests high in potassium and low in phosphorus. The soybeans in the zero-fertilizer check treatment yielded as well as those receiving the broadcast. The deep band treatment yielded significantly better than broadcast but not better than the check. Even if yield difference between deep banding and the check had penciled out to be significant, it would not have been sufficient to outweigh the additional cost. The check turned out to be the most profitable treatment.

Don and Sharon Davidson, Grundy Center, also evaluated a fall deep band in the row in relation to a zero-rate check (Table 2). They used the bander belonging to PFI members Harlan and Sharon Grau, from Newell. The experiment also included a starter fertilizer treatment and a fall knife-only treatment. The knife-only treatment was the same as the deep band but without the fertilizer. It was included to see if there was a mechanical effect separate from the fertilizer effect of deep banding. The soil generally tests high in both potassium and phosphorus. The knife-only treatment did not

MULTIPLE-TREATMENT FERTILITY TRIALS

TREATMENT "B"					TREATMENT "C"					
DESCRIPTION	YIELD (bu. or T)	STAT	TRT COSTS	$ BENEFIT	DESCRIPTION	YIELD (bu. or T)	STAT.	TRT COSTS	$ BENEFIT	OVERALL COMMENTS
BROADCAST 0+55+50	48.3	b	$21.30	($21.30)	ZERO CHECK	49.1	ab	$0.00	$0.00	
SPRING STARTER	126.0	ab	$14.37	($14.37)						STARTER FERTILIZER: 4+13+26
KNIFE ONLY	121.1	b	$7.16	($7.16)	ZERO CHECK	120.2	b	$0.00	$0.00	
FALL BROADCAST 32+80+70	114.4	b	$38.83	($2.26)	ZERO CHECK	101.6	c	$0.00	$0.00	P AND K SOIL TEST: VERY HIGH. MANURED IN SPRING 1994. LEAF N 2.6-2.7%
375 LBS SUSTANE	143.7	a	$48.75	($48.75)						SOIL TEST P: VERY HIGH, K: HIGH. LEAF TISSUE K SIGNIF. HIGHER WITH 3+8+50, LEAF N SIGNIF. HIGHER WITH 375 LBS SUSTANE.
CHEMICAL 3+8+50	149.5	a	$8.77	($8.77)	ZERO CHECK	143.0	a	$0.00	$0.00	
STARTER	86.9	a	$18.30	($18.30)	ZERO CHECK	88.1	a	$0.00	$0.00	

affect corn yield. The spring starter had a yield somewhat greater than the check, but not significantly so. Because of the costs involved, it was the least profitable treatment. The deep band did increase corn yield significantly in this experiment, but because of the cost it was only about two dollars per acre more profitable than the check treatment with no fertilizer.

Dean and Deborah Ekstrand, of Pocahontas, also tried a fall deep band (32+80+70) ahead of corn, comparing that to a broadcast of the same rate and a zero-fertilizer check (Table 2). The field tests very high in both potassium and phosphorus, and it received manure in the spring of 1994. No additional N was applied to the crop. Leaf tissue samples at silking indicated no nutrient shortages, including nitrogen. But the broadcast fertilizer yielded significantly more than the check (13 bushels). And the deep band treatment yielded 24 bushels more than the check, making it the most profitable practice. The field overall yielded about 50 bushels less than nearby fields. If the treatment response was just to the 32 pounds of N in the fall-applied fertilizer, the crop must have run very short of nitrogen late in the season.

The deep band did increase corn yield significantly in this experiment, but because of the cost it was only about two dollars per acre more profitable than the check treatment with no fertilizer.

Richard and Sharon Thompson, Boone, included a deep band treatment in a trial with spring-applied manure and manure-plus-starter fertilizer (Table 5, Field 4D). The deep band significantly increased corn yield compared to the zero-rate

Table 3. Preliminary Results for Deep-Banding Trials on Farmers' Fields

Crop	Site	Tillage	Control	P broad	P deep	K broad	K deep	P & K broad	P & K deep	Significance for:	
			-- bushels per acre --							Rate	Placement
Corn	1	NT	129	130	132	135	141	133	131	K	K
Corn	2	NT	115	122	122	118	130	133	130	K	K
Corn	3	NT	121	127	130	127	122	130	128	P	P
Corn	4	NT	173	183	184	176	179	185	197	K	K
Corn	5	NT	121	125	130	125	136	129	129	ns	ns
Corn	Alert	RT	122	130	133	112	139	140	144	K	K
Corn	Bauer	RT	132	144	138	142	143	135	147	P & K	ns
Corn	Davidson 1	RT	152	155	154	157	156	165	154	ns	ns
Corn	Davidson 2	RT	141	143	147	144	144	140	145	ns	ns
Corn	Grau	RT	133	131	133	127	133	140	136	ns	ns
Beans	1	NT	44.1	43.5	47.1	49.2	50.7	44.5	47.0	K *(10%)	ns
Beans	2	NT	55.1	57.5	53.4	54.5	53.4	53.5	57.7	ns	ns
Beans	3	NT	39.7	41.2	39.2	43.1	42.7	42.5	44.5	ns	ns
Beans	Alert	RT	39.7	37.9	41.6	39.9	41.1	39.0	45.9	ns	ns
Beans	Bauer	RT	32.4	35.5	37.8	33.3	32.9	36.4	39.3	P	ns
Beans	Davidson	RT	49.8	50.2	47.1	48.0	47.2	46.7	48.3	ns	ns
Beans	Grau	RT	44.0	47.8	48.2	47.1	46.4	46.0	47.4	P	ns
Beans	Thompson	RT	59.6	62.1	58.5	61.2	60.9	60.2	62.9	ns	ns

ns = not significant difference NT = no-till RT = ridge-till

* Rate was significant only at the 10 percent level (90 percent statistical confidence).

check treatment, but the cost of the band outweighed the yield benefit.

PFI cooperators have been working with ISU agronomist Antonio Mallarino, who is also carrying out his own extensive trials of fertilizer placement. PFI cooperators have been doing starter and fertilizer placement trials for years. No consistent picture has emerged, despite indications that placement may be especially important in the reduced tillage systems that many PFI members use. Part of the difficulty is the number of variables. These include changes in weather from year to year, and changes from farm to farm in fertilizer formulations, rates, placement, and soils. A group of cooperators is collaborating with Mallarino to get some answers.

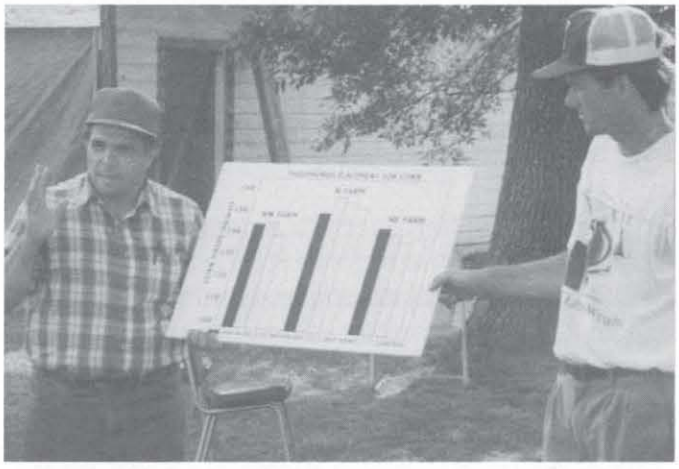
Mallarino assisted four PFI cooperators in carrying out their own trials, reported in Tables 3 and 4. He also included these ridge-till farms in a wider study that includes no-till producers and ISU research farms. At these sites, Mallarino compared two rates of deep banding or broadcast and a zero-rate check treatment, looking separately at phosphorus and potassium. He also combined P and K in one treatment, and in some corn trials he applied starter fertilizer over duplicates of plots receiving either no preplant P and K or preplant P and K. Mallarino and his team conducted these experiments both in corn and in soybeans. They are still analyzing the data from 1995, but they can report some preliminary findings.

Table 4. Starter Study for Corn on Farmers' Fields

Crop	Site	Tillage	--- No PK Preplant ---			-- With PK Preplant --		
			Control	Starter	Stat	PK	PK + S	Stat
			bushels per acre			bushels per acre		
Corn	1	NT	129	134	ns	132	129	ns
Corn	2	NT	115	116	ns	132	127	ns
Corn	3	NT	121	126	ns	129	131	ns
Corn	4	NT	173	199	*	191	192	ns
Corn	Alert	RT	122	133	*	142	143	ns
Corn	Davidson 1	RT	152	155	ns	160	162	ns
Corn	Davidson 2	RT	141	155	*	143	157	*

NT = no-till RT = ridge-till
ns = no significant difference * = statistically significant difference

The results in Table 3, for comparisons of preplant placements, are averaged over the two fertilizer rates because there were not significant yield differences between rates. The control shown is the average of the no-broadcast and the knife-only zero rate plots because usually there was no difference between these treatments or differences were not consistent.



Antonio Mallarino and Doug Alert look at placement results.

Soybeans did not respond to P or K fertilization in most 1995 trials, and never responded to placement. In corn, there were responses to fertilization and placement in several trials. When there were significant differences, the deep-banded treatment yielded more than the broadcast treatment. Except for one or two trials the response to placement was small, and usually it would not pay the extra application costs. Responses to potassium in two ridge-till sites, however, probably were large enough to outweigh additional costs, reports Antonio.

The results in Table 4 show preliminary results of comparisons of starter fertilizer. The starter was an NPK mixture (liquid) that varied among trials.

Soybeans did not respond to P or K fertilization in most 1995 trials, and never responded to placement. . . Responses to potassium in two ridge-till sites, however, probably were large enough to outweigh additional costs, reports Antonio.

Table 5. MULTIPLE-TREATMENT MANURE TRIALS

				TREATMENT "A"				
COOPERATOR	CROP	PREVIOUS CROP	YIELD SIGNIFI-CANCE	DESCRIPTION	YIELD* (bu. or T)	STAT.	TRT COSTS	$ BENEFIT
THOMPSON (FIELD 4C)	CORN	SOYBEAN	*	PLANTER ROW FERTILIZER	158.0	bc	$24.79	($24.79)
	($ BENEFIT DEPENDS ON COMPARISON TRT)						CROP OVER COST:	$425.64
	MAIN EFFECTS:	+/- MANURE:		SPRING MANURE	165.1	a	$12.46	$5.54
		+/- ROW FERTILIZER:		PLANTER ROW FERTILIZER	163.0	a	$24.79	($12.75)
THOMPSON (FIELD 5)	SOYBEAN	CORN	*	PLANTER ROW FERTILIZER	61.6	a	$24.79	($4.50)
($ BENEFIT DEPENDS ON COMPARISON TRT)							CROP OVER COST:	$360.16
THOMPSON (FIELD 4D)	CORN	SOYBEAN	*	FALL DEEP BAND 0+30+60	159.5	a	$20.48	($3.76)
	($ BENEFIT DEPENDS ON COMPARISON TRT)						CROP OVER COST:	$434.22

Antonio applied additional nitrogen broadcast at planting time (about 100 lbs N/acre) to minimize the response to starter nitrogen. There was positive response to the starter when compared with yields of plots that received no P or K preplant. When the starter was applied after a high rate (double the maintenance rate) of preplant (fall) P and K, however, they observed no response except at one site.

Mallarino will complete work with PFI cooperators and the other farmers in 1996. The results from 1995 suggest that yield increases from deep-banded P or K are not reliable enough to offset higher application cost of yearly applications. However, Mallarino thinks that less frequent deep banding could be profitable. Although not all ridge-till fields showed a response to deep-banded potassium, the yield differences in the responsive fields suggest a probable benefit to deep banding when averaged over multiple fields and seasons.

Manure and Planter Row Fertilizer

The manure/fertilizer placement trial by the Thompsons was one of three they are carrying out to find the best combination and timing of manure and fertilizer application. In that particular experiment, the most profitable treatments were spring-applied manure and the zero-application check. The least profitable practices were deep banding (despite the yield increase) and manure-plus-planter row fertilizer.

MULTIPLE-TREATMENT MANURE TRIALS

TREATMENT "B"					TREATMENT "C"					
DESCRIPTION	YIELD (bu. or T)	STAT	TRT COSTS	$ BENEFIT	DESCRIPTION	YIELD (bu. or T)	STAT	TRT COSTS	$ BENEFIT	OVERALL COMMENTS
SPRING MANURE	162.2	b	$7.07	$12.66						
CROP OVER COST:				$455.26						
BOTH MANURE & ROW FERTILIZER	167.9	a	$31.87	$4.13	CHECK (NOTHING)	155.3	c	$0.00	$0.00	PLANTER ROW FERTILIZER: 8+23+46
CROP OVER COST:				$446.73	CROP OVER COST:				$442.60	MANURE: 168+85+116
NO MANURE	156.7	b	$0.00	$0.00						
NO PLANTER ROW FERTILIZER	158.8	b	$0.00	$0.00						
SPRING MANURE	57.8	b	$7.07	($7.07)	ZERO CHECK	58.9	b	$0.00	$0.00	
CROP OVER COST:				$354.25	CROP OVER COST:				$367.99	
SPRING MANURE	157.5	ab	$7.07	($7.07)						
CROP OVER COST:				$441.84						
MANURE & PLANTER ROW FERT	156.7	ab	$31.87	($31.87)	ZERO CHECK	153.7	b	$0.00	$0.00	
CROP OVER COST:				$414.63	CROP OVER COST:				$437.99	

In these three trials by Thompson in Table 5, the most profitable treatment was not always the top yielder. Table 5 shows "$ Benefit" calculated the usual way, but it also shows "Crop Over Cost," the value of the yield minus treatment cost. This provides another version of the net value of a practice, one not based on statistical differences.

"Planter row fertilizer" is how Dick Thompson describes the 8+23+46 that he places two inches below the seed with the deep placement shoe on the planter. The four treatments in the trial in field 4C (Table 5) were: spring-applied manure, planter row fertilizer, both together, and neither. These make a two-by-two factorial design where each factor (manure and planter row fertilizer) occurs with both combinations of the other factor.

In these three trials by Thompson in Table 5, the most profitable treatment was not always the top yielder.

The table shows that manure-plus-fertilizer gave the top yield, but, again, not the best profit. That honor went to the manure-only treatment.

The two factors, manure and row fertilizer, can be evaluated on their own, as shown in the table. Averaged over treatments, both manure and row fertilizer were statistically significant factors for corn yield. However, while manure overall was associated with a $5.54 per acre benefit, the factor of row fertilizer led to an overall $12.75 loss.

Table 6. OTHER MULTIPLE-TREATMENT TRIALS

COOPERATOR	CROP	PREVIOUS CROP	YIELD SIGNIFI-CANCE	TREATMENT "A" DESCRIPTION	YIELD (bu. or T)	STAT.	TRT COSTS	$ BENEFIT
FRANTZEN/ NATVIG	HAZEL-NUTS	PASTURE		TUBEX TUBING TO PROTECT TRANSPLANT			$4.55	
			*	HEIGHT (CM)	32.9	a		
			*	DIAMETER (MM)	3.6	a		
			*	NUMBER OF NODES	6.8	a		
				WOOD CHIP MULCH AROUND TRANSPLANT			$4.35	
			*	HEIGHT (CM)	26.1	b		
			*	DIAMETER (MM)	3.2	ab		
			N.S.	NUMBER OF NODES	5.7	a		
THOMPSON	SOYBEAN	CORN	N.S.	EARLY, LIGHT PLANTING	57.9	a	SAME	
			*	BROADLEAF WEEDS/ACRE:	574	a		
			N.S.	EARLY, DARK PLANTING	59.6	a	SAME	
			*	BROADLEAF WEEDS/ACRE:	542	a		
WEEDS MAIN EFFECT: PLANTING DATE				EARLY PLANTING	558	a	SAME	
WEEDS MAIN EFFECT: LIGHT VS. DARK PLANTING				PLANTING IN LIGHT	410	a	SAME	

The Thompsons carried out a similar trial in a soybean field that will go to corn in 1996 (Table 5, field 5). There the planter row fertilizer increased soybean yield over the check treatment but not sufficiently to pay for itself. Spring-applied manure did not increase yield and led to an even greater loss. These fields have benefited from manure for many years, and it isn't surprising that soybeans failed to respond to a single application. Soil test phosphorus and potassium are both in the very high range.

Hazelnut Establishment Trial

Two PFI farmers in northeast Iowa have invested in diversification, planting a perennial crop – hazelnuts. Tom and Irene Frantzen, Alta Vista, and Mike and Shelly Natvig, Cresco, want to know the most cost effective way to get young hazel plants through their first years of life. With help from *PFI Sustainable Projects* and the Organic Farming Research Foundation, they established a trial on both their farms to answer the question (Table 6). Carrying out the same trial on more than one farm

OTHER MULTIPLE-TREATMENT TRIALS

TREATMENT "B"					TREATMENT "C"					
DESCRIPTION	YIELD (bu. or T)	STAT	TRT COSTS	$ BENEFI	DESCRIPTION	YIELD (bu. or T)	STAT	TRT COSTS	$ BENEFIT	OVERALL COMMENTS
SEEDLING WITHOUT TUBEX			$4.00							ALL TRTS HAVE $4 SEEDLING COST. TREATMENTS NOT RANDOMIZED.
HEIGHT (CM)	26.3	b								
DIAMETER (MM)	2.9	b								
NUMBER OF NODES	5.4	b								
BARE GROUND MAINTAINED AROUND TRANSPLANT			$4.50		NO MULCH OR BARE GROUND			$4.00		COST OF MAINTAINING BARE GROUND WILL BE ONGOING
HEIGHT (CM)	31.0	a			HEIGHT (CM)	31.9	a			GROUND TREATMENT HEIGHT DIFFERENCES ESPECIALLY WHERE NO TUBEX USED
DIAMETER (MM)	3.5	a			DIAMETER (MM)	3.1	b			
NUMBER OF NODES	6.1	a			NUMBER OF NODES	6.6	a			NODE DIFFERENCES SIGNIFICANT WHERE NO TUBEX USED
LATE, LIGHT PLANTING	58.6	a	SAME							'STRIP SPLIT PLOT' EXPERIMENT. PLANTING DATE SIGNIFICANT FOR WEEDS
BROADLEAF WEEDS/ACRE	164	b								
LATE, DARK PLANTING	58.8	a	SAME							LIGHT/DARK NOT STATISTICALLY SIGNIFICANT FOR WEEDS
BROADLEAF WEEDS/ACRE	91	b								
LATE PLANTING	127	b	SAME							EARLY PLANTING MAY 19, LATE PLANTING MAY 31
PLANTING IN THE DARK	362	a	SAME							

can be a very powerful tool, because results can be applied more widely.

There were two approaches to establishing hazelnut transplants that these producers wanted to evaluate; protective tubes and ground maintenance. Tubex® tubes are made of plexiglass and are used to protect young trees and bushes from extremes of weather and browsing deer and rabbits. Elevated humidity inside the tubes reduces stress on the plants during the growing season, and the tubes give some winter protection as well. Traditional methods of establishing transplants have reduced competition from weeds by keeping an area of bare ground around the plants. Sometimes a mulch has been used to accomplish the same thing. Mulch also buffers changes in soil moisture and temperature, and it requires less total labor than maintaining the bare ground.

The Frantzens and Natvigs set out a two-by-three factorial experiment. Three methods of ground preparation were included: bare ground, wood chip mulch, and no ground preparation at all.

Plants with Tubex averaged 25 percent taller than those without, and they also had greater diameter and more nodes.

Each of these three methods was tried with and without the Tubex tubes. Each farm had six replications of these six combinations. Table 6 gives results overall for both farms together, and it shows the two factors (one a two-level factor and the other a three-level factor) rather than the six individual treatments.

In late June they transplanted their hazelnut seedlings into rows deep-ripped with a single shank chisel. At the end of the season, they measured several growth parameters, including plant height (in centimeters), plant diameter (in millimeters), and the number of bud nodes. The end results won't be known until at least one winter has passed, but the first year data tells a story. Plants with Tubex averaged 25 percent taller than those without, and they also had greater diameter and more nodes. All these differences were statistically significant.

Ground preparation also made a difference. Plants with no preparation or with bare ground were significantly taller than those with wood chip mulch. Plants with bare ground maintained had significantly greater diameter than plants with no ground preparation, while the diameter of mulched plants was intermediate. There were no significant differences in number of nodes, except when tubes were not used. Then plants with no ground preparation had significantly more nodes than mulched plants, with the bare ground treatment falling in between. The height differences between treatments were also greater when tubes were not used.

At the experiment's completion, there may be a trade-off between effectiveness and cost. Some of these methods have only initial costs, others have ongoing costs. If hazel plants survive better or come into production sooner with certain methods, those benefits may outweigh the costs. The Frantzens and Natvigs will follow this experiment for the next several years.

Weed Management Trials

In 1995, Richard and Sharon Thompson, Boone, developed their 1994 trial of light-versus-dark planting into a two-by-two factorial experiment combining light/dark planting and planting date (Table 6). Some experiments in Europe and the U.S. have suggested that weed numbers can be reduced by depriving weed seeds of light at planting. Doug Buhler, weed scientist at the National Soil Tilth Lab, who provided consultation, says it may only take a split second of exposure to light to signal some weed seeds to germinate. Dick Thompson attempted to achieve dark planting conditions by building housings over the units on his ridge-till planter. An electric light in each unit could be switched on for the light-planting treatments.

The Thompsons have often observed reduced weed pressure when crops were planted later than usual. Later planting allows the planter and rotary hoe to catch more of the spring flush of weeds, and there may be other factors involved as well. In all,

Back to Conventional Grazing – For Awhile

Steve Hopkins and Sarah Andreasen, Newton

Nineteen ninety-four was our third year under intensive rotational grazing management on a rented farm in northeast Iowa, near Decorah. Our 20-25 Jerseys grazed 20 rugged acres of predominantly bluegrass pasture that was divided into 30 paddocks with water in each. Nearly ideal growing conditions in 1994 enabled us to rely almost entirely on pasture for forage well into the fall. Our feed costs for 1994, which include actual purchase costs of hay, grain, minerals, and pasture rent, averaged $4.41 per hundredweight (cwt) of milk produced from March 1 through October 31.

Nineteen ninety-five was our first year of dairying on the farm we bought in central Iowa, near Newton. Since we were not able to complete fence construction and water line placement, we managed our herd of 20-25 Jerseys using conventional grazing. Our 25 acres of pasture on this

Early planting, however, resulted in a fourfold increase in broadleaf weeds compared to late planting.

the trial had four treatments: early planting in light, early planting in the dark, late planting in light, and late planting in the dark.

Neither planting date nor planting conditions had an effect on soybean yield. Early planting, however, resulted in a fourfold increase in broadleaf weeds compared to late planting. The light-dark factor did not have a significant effect on weed numbers either, but there is the suggestion of a reduction in weeds with dark planting at the late planting date.

Two other PFI cooperators carried out weed management trials in 1995. Ron and Maria Rosmann, Harlan, set out to time the pre-emerge rotary hoeing of corn by heat units accumulated in the soil (Table 7). Because of cool spring conditions, though, the weeds didn't wait for the heat units, at least as Ron was measuring them. He went ahead and hoed as demanded by the weed growth he saw in the field. The trial compared pre-and-postemergence hoeing to a single postemergence

Ron Rosmann demonstrates cultivation for weed control at a field day cosponsored with the Leopold Center, ISU Extension, and the NRCS.

farm included 17 acres of rolling, permanent bluegrass pasture with severe weed problems and an 8-acre corn field no-till seeded to pasture in April of 1995. Despite having somewhat greater pasture acreage than our previous farm, there was less usable forage for the herd because of fallen trees, scrap metal debris, and infestations of hemp, ragweed, and Canadian thistle. We spent much of the summer liberating the permanent pasture of this competition using bush hogs and chain saws, as the cows grazed wherever they could.

Largely because of this situation, we had to make up for poor pasture quality with purchased feed – grain, minerals, and hay. In addition, after a very wet April and May, we endured very dry growing conditions in July, August, and September of 1995. Since our pasture had no rest periods in which to recover and grow during the dry spell, we ran out of forage at the end of August. We were forced to immediately feed hay and additional grain to make up for the lack of pasture.

Consequently, our feed costs for 1995, which include purchased grain, hay, minerals, and a pasture rent equivalent charge, averaged $7.43 per cwt of milk produced from March 1 through October 31. Adding a standard overheat cost of $5.00 per cwt to our feed costs, our average total cost of production was $9.41 per cwt in 1994 and $12.43 per cwt in 1995. Because of greater feed costs, our 1995 returns (income over total costs per cwt) were less than half of the returns in 1994 (see Figure 5). We hope to drastically cut those feed costs in 1996 by beginning a rotational grazing strategy on our new farm.

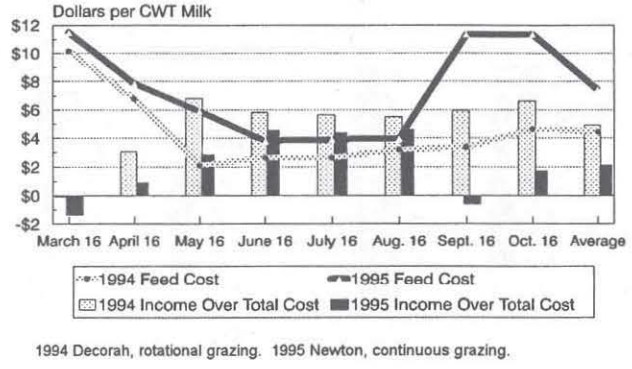


Figure 5. Feed costs and net per CWT for 1994 and 1995, Hopkins/Andreasen.

hoeing. Ron found no significant difference in corn yield, and he reports grass numbers were low throughout the experiment.

Don and Sharon Davidson, Grundy Center, evaluated a planter band of herbicide in their ridge-till soybeans (Table 7). The treatment receiving no band was not rotary hoed. Both treatments were cultivated. Don has noted that in some years rotary hoeing seems to be unnecessary in his ridge tillage system. The data indicate that 1995 was not one of those years. He reports grass was significantly more prevalent in the no-herbicide-no-hoe treatment, and the soybean yield difference (2.9 bushels) was statistically significant.

Other Seed and Seeding Trials

In 1995 Ted and Donna Bauer, Audubon, repeated an evaluation of row spacing for soybeans. They compared their customary 38-inch rows to 19-inch rows achieved with a double pass of the planter (Table 8). In the 38-inch rows, Ted banded Pursuit® and Destiny® and cultivated once.

Barley-versus-Corn-Based Hog Rations

Dan and Lorna Wilson, Colin and Carla Wilson, Paullina

This test was conducted to determine the production and economic differences between a corn/soy ration and a corn/barley/soy ration. We wanted to see if barley is a viable alternative to corn in a swine grower-finish ration. We were looking for an economic use for the barley that we raise as part of our crop rotation.

The test used 241 head of crossbred barrows. They were all farrowed within a 10-day period and were of a uniform size and body type. They went on test at approximately 65 days of age and 65 pounds. These barrows were from a three-way cross of York boars on Duroc/Chester sows. The test was conducted in bedded barns with concrete lots. The hogs from the two treatments were sold at 240 pounds, in groups of equal numbers. All were marketed on a carcass basis. Last year's test was conducted on pasture, and we only graded about 30 animals that we weren't going to breed in each group.

The two rations were balanced according to amino acids, not just percent protein. Both groups were on a corn/soy ration until they weighed 75 pounds, when the barley group went to 200 pounds of barley per ton. When the pigs reached 180 pounds, barley was increased gradually to 650 pounds per ton, 40 percent of the grain in the ration. Both rations used rolled grain and were prepared and delivered by the local elevator. Both groups of pigs used similar feeders.

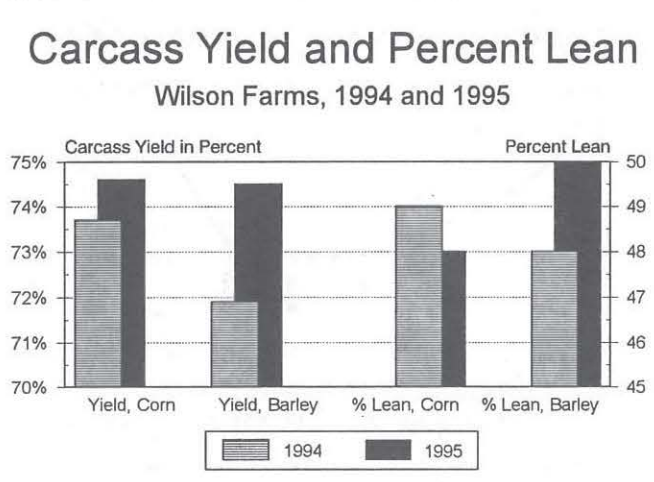


Figure 6. Carcass yield and quality in feeding trial.

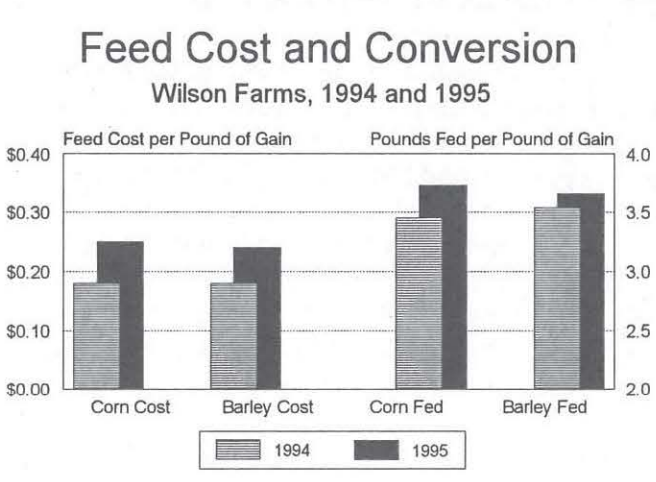


Figure 7. Feed cost and amount per pound of gain.

In the 19-inch rows he broadcast these materials and did not attempt to cultivate. The seeding rate in 38-inch rows was 144,000 seeds per acre, while in narrow rows it was 185,000 seeds per acre.

In 1994 the narrow rows yielded more but netted less due to additional costs involved. In 1995, the narrow rows again yielded more (4.5 bushels), and this year they penciled out to a $4.73 per acre advantage. That is taking into account the additional labor and equipment cost of a second planter pass (estimated at $7.98). The costs con-

The Wilsons farrow in A-frames twice a year.

As I mentioned, one of the changes we made in this year's test compared to last year was to sell all hogs on carcass merit. This way we were better able to compare carcass differences. This year we also used all barrows instead of gilts, and we raised this year's test on concrete instead of pasture. We also had the grain rolled instead of using a hammer mill. At the conclusion of our test, we learned from other sources that the roller mill is much better for barley. Whereas the hammer mill produces a fair amount of dust, the roller mill yields a more uniform particle size.

In calculating economics, we used $2.50 per bushel for corn and $1.95 per bushel for barley. All other ration ingredients were at cost. Because barley is higher in lysine than corn, we were able to reduce the soybean meal in the barley ration, accounting for some of the cost savings.

For us, the real surprise came in the carcass results. Because of the higher fiber in barley, we were expecting slower gains, more feed per pound of gain, and a fatter carcass. Our results showed no real difference in rate of gain, slightly better feed conversion with barley, and a leaner carcass (Figures 6 and 7). There was a $3.90-per-pig net advantage for the barley ration (Figure 8). Of that, $1.47 came from carcass premiums. The rest was from lower feed cost and slightly better feed conversion.

At the end of our test we got some useful confirmation from Dr. N.H. Williams, who works for Land 'O Lakes in Fort Dodge. He confirmed that our results were comparable to other research on barley. He told us barrows will work slightly better than gilts on barley and that rolling is much better than a hammer mill. He also said that while pigs in the 52-percent-lean-or-less category will show good improvement on barley, pigs with the really lean genetics generally will not. This relates to how well these lean pigs (and gilts, which tend to be leaner) cope with the additional fiber in barley. Because the genetics for outdoors tends to be less lean than for total confinement, barley is probably a better alternative for hogs raised outside. The nutritionist stressed the importance of gradually increasing the ration barley as the pigs grow.

In conclusion, we feel that barley is definitely an alternative to corn in a grower/finish swine ration on our farm and probably on many other farms as well.

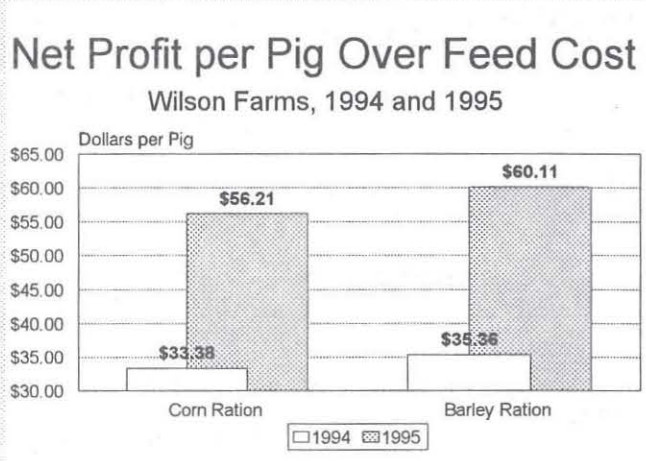


Figure 8. Net after feed costs for barley- and corn-based rations.

Table 7. WEED MANAGEMENT TRIALS

COOPERATOR	LOW RATE TREATMENT					HIGH RATE TRT
	DESCRIPTION	TREATMENT COST	YIELD	BROADLEAF WEEDS/ACRE	OTHER WEED INFORMATION	DESCRIPTION
(CORN)						
ROSMANN	POSTEMERGE HOE ONLY	$2.87	158.7			PRE & POST HOE
(SOYBEANS)						
DAVIDSON	CULTIVATION BUT NO HOE OR HERB.	$8.29	46.4	72	GRASS RATING 2.8	LASSO II PLANTER BAND, CULTIVATION

nected with a dedicated narrow-row planter would be less.

Dave and Lisa Lubben, Monticello, evaluated a planter attachment to improve seed-to-soil contact (Table 8). The simple plastic device presses the seed firmly into the slot created by the planter, an

Table 8. OTHER SEED AND SEEDING TRIALS

COOPERATOR	CROP	TREATMENT "A"			TREATMENT "B"
		DESCRIPTION	YIELD (bu.)	TREATMENT COST	DESCRIPTION
BAUER	SOYBEANS	19-INCH ROWS	48.4	$59.90	38-INCH ROWS
		(ADDITIONAL DOUBLE PLANTING COST):		$7.98	
LUBBEN	CORN	SEED FINISHER ATTACHMENT	112.5	$0.10	NORMAL PLANTER
NEELY-KINYON	SOYBEANS	LS201 TOFU SOYBEANS	36.6	$22.00	STINE 2250 SOYBEANS

WEED MANAGEMENT TRIALS

HIGH RATE TREATMENT				TREATMENT DIFFERENCES					COMMENTS
TREAT-MENT COST	YIELD	BROADLEAF WEEDS/ACRE	OTHER WEED INFORMA-TION	YIELD DIFF.	YLD. SIG.	YLD. LSD	BRDL. WEED SIG.	LOW RATE $ BENEFIT	
$5.90	155.8		NO DIFFERENCE IN GRASS	2.9	N.S.	4.0		2.95	TRIED TO TIME HOE BY DEGREE-DAY
$14.89	49.3	27	GRASS RATING 1.0	-2.9	*	2.1	N.S.	($11.61)	GRASS RATING SIG. LOWER WITH HERB.

effect similar to that of a narrow press wheel. There was no yield benefit in the 1995 trial, and Dave now thinks any advantage would only be evident in a year with dry planting conditions.

The Neely-Kinyon farm, Greenfield, is involved with local producers interested in the market potential for edible soybeans and identity-preserved marketing. A trial on the farm compared a large-

OTHER SEED AND SEEDING TRIALS

TRT "B"		DIFFERENCE				COMMENT
YIELD (bu.)	TREAT-MENT COST	YIELD DIFF.	YLD LSD (bu.)	YLD SIG.	$ BENEFIT OF TRT "A"	
43.9	$36.43	4.5	1.8	*	$4.73	
118.3	$0.00	-5.8	6.5	N.S.	($0.10)	TREATMENTS NOT RANDOMIZED
42.8	$18.75	-6.2	2.9	*	$30.93	CONTRACTED FOR $1.40 OVER CHICAGO BOARD (EFFECTIVELY $1.90/BU)

Learning When to Calve in a Grass-Based Dairy

Matt and Diana Stewart, Oelwein

This report is a continuation of the article that appeared in the Winter 1994 issue of *the Practical Farmer*. If anyone would like a copy contact us at (319) 203-1337 or got in touch with the PFI coordinators.

The past twelve months have seen us continue to test the extremes of low-input, grass-based dairying and how we can adapt some of New Zealand's management strategies to our Northeast Iowa dairy. Last winter we experimented with wintering heifers (over one year old) and dry cows outside. We kept this group of about 60 head away from the buildings and fed them round bales of hay on our newly-seeded pastures.

Our land is gently rolling with a small creek. The cattle kept the creek open all winter and learned where to seek protection from the wind. Round bales were fed on pasture without being unrolled or placed in round bale feeders. There was very little residue left in the spring, and a light spring seeding of ryegrass and clover seed covered up any trace of hay by the middle of May.

Our only mistake was in expecting these cattle to graze effectively in February. We are having to develop a cow-calf person's eye for body condition, and I think we will be better able to manage this situation this winter. We are now calving heifers at 28-30 months of age, since that age heifer performed better this past year under our low-input system.

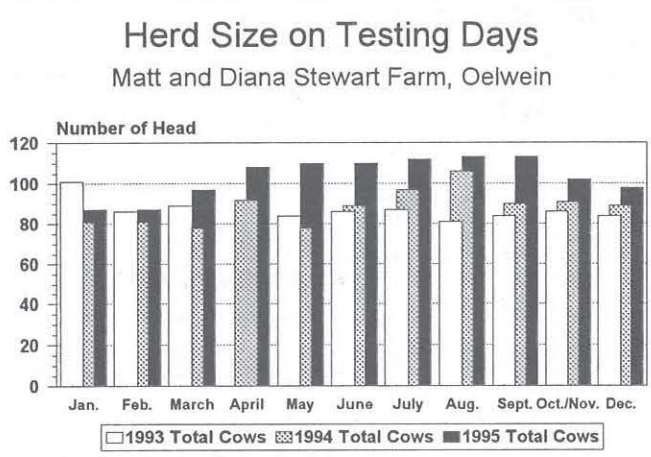


Figure 9. Herd size over three years, Stewart farm.

Another trial this past year has involved drying up cows early if we didn't think there was much to be gained by continuing their lactation. This may be the most radical idea to traditional U.S. dairyman that we have observed in the New Zealand paradigm. We have employed this practice in a couple of different situations on a significant number of cows. It will allow us to increase the number of cattle we have on grass in the next year, and it helped to increase our cow density this past year (Figure 9). It is affordable because of our low-cost methods of maintaining these cattle.

The first situation was with a group of heifers that calved in July and August, 1994, that was dried off on February 1, 1995. Six of these were bred in late January and one other was open. The experience has prepared us for what we expect to occur this coming year, but it caused a cash flow problem at the time that took most of the summer to work through.

This is an example of something we've done to learn how far we can go. The cash flow problem should not be as severe this year because a greater number of cows will freshen beginning in February. The second major dry-up came on November 1, 1995, when we moved inside and dropped from 100 to 79 cows milking. Our barn only holds this many, so we will stay at 79 until we go back to grass.

We have now set up our herd to calve seasonally, calving in both the spring and fall. Phil Specht in Clayton County, Iowa has done this for the past few years, and it seems to be the type of low-input system that will fit the traditional, established dairy of the upper Midwest. We will not have to increase our capital investment in facilities and can probably double our cow numbers without sacrificing profit per cow. The advantages to spring-calved, grass-based dairying have been well documented. Fall-calving dairies built the Midwest dairy industry. As is the case of much of the sustainable agriculture

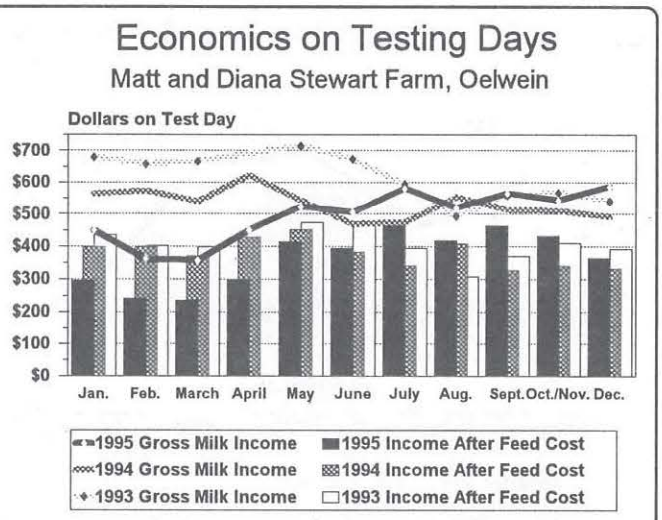


Figure 10. Gross and income after feed cost for three years.

movement, many of the answers to our future can be found in our history.

Fall-freshened cows are bred in December and January, not in the heat of summer. These same cows will milk enough more in the winter (because of the lack of heat stress) to compensate for the cost of baling hay. Come spring these cows can go to grass without grain supplementation and produce profitably during the latter part of their lactation. Spring-calved cows, on the other hand, would have to be on hay and grain during the latter part of their lactation, which would come in late fall and early winter. One of the biggest differences, though, may be the cost of raising calves. Fall-born calves can be raised outdoors with little supplement feeding from 8-24 months. Our area of Iowa requires more feed, shelter, and labor for spring-born calves.

We started grazing in April of 1994 and the first grazing data appears in the May, 1994 test (Figure 10). Supplemental forage feeding started in July of that year and in October of 1995. Nineteen ninety-three and 1994 had similar milk prices. Milk has been worth about 10% less in 1995, depressing our income-over-feed cost by about $50 per week compared to last year. Given that, our income-after-feed held up well. And we feel we are making progress toward a system that utilizes grass and seasonality in ways that fit our goals and climate.

(Continued from page 45.)

seeded, tofu-type variety (LS-201) to a commercial variety of similar maturity (Stine 2250). Both are early group II varieties, reports Bernie Havlovic, who coordinated the trial. Both were planted at 150,000 seeds per acre on June 7.

The specialty soybeans yielded more than six bushels less than the comparison variety. But they brought almost $31 per acre more profit (Table 8). The tofu beans had been contracted for $1.40 per bushel over the Chicago Board of Trade price. Including the basis between Audubon and Chicago, that effectively made them worth $1.90 more than other soybeans. The Neely-Kinyon Farm will continue to explore edible soybean production, says Bernie, and they are hopeful that a tofu variety better adapted to their area will be available in coming years.

The specialty soybeans yielded more than six bushels less than the comparison variety. But they brought almost $31 per acre more profit

Biological Control of Corn Borer

Joe Fitzgerald, New Melleray Abbey, Peosta

We sought to control the European corn borer in field corn with timed releases of trichogramma wasps. Our experiment was conducted on two one-acre plots with the assistance of Iowa State University entomologists. Our goal was to control the corn borer without using chemicals.

Michigan State University research indicated a 78 percent reduction of European corn borer larvae with the release of trichogramma wasps (Orr and Landis, 1993). Chemical control of the corn borer was less effective: Dipel, 34% reduction; Pounce, 65% reduction; Lorsban, 66% reduction.

The first step in the experiment was to acquaint those involved with the life cycle and effectiveness of the wasps. We hosted a meeting of three neighboring farms and the staff of our own farm early in the 1995 growing season. We involved other farmers in this meeting to expand the public awareness and understanding of integrated pest management. Staff from the Practical Farmers of Iowa and the ISU Department of Entomology led the meeting.

The ISU entomologists scouted fields to locate plots which offered the possibility of corn borer infestation. Once identified, the plots were flagged (marked) for eventual release of wasps. Scouting was later done to determine if enough larvae were present to warrant the first release of the wasps. Fortunately for the farmer but unfortunately for the entomologists there were never enough larvae spotted to trigger a release of wasps.

The experiment was a success in that it highlighted the value of scouting for pests and provided the opportunity to broaden local awareness of integrated pest management. The trial was reviewed at our July 13, 1995 field day with an attendance of nearly 100 persons.

Biological Control of Alfalfa Weevil – I

Mark and Julie Roose, Pella

On May 16, 1995, assisted by ISU graduate student Kris Giles, we began a two-year project studying biological control of the alfalfa weevil.

Kris Giles shows alfalfa weevil larvae at the Roose field day.

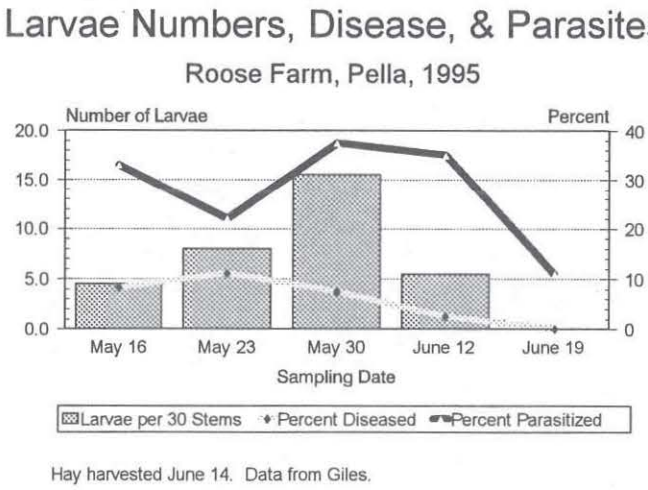


Figure 11. Alfalfa weevil larvae and their pests on the Roose farm in 1995.

This is part of the PFI IPM project supported by the Leopold Center for Sustainable Agriculture. The spring of '95 was wet and cold up to mid-June. From then on our growing season was dryer than normal.

The field was almost a pure stand of alfalfa. We began by taking 100 sweeps through our hay field with an insect net. Our plan was to take 40 weevil larvae from the net and rear them in 20 small vials filled with alfalfa leaves and topped with a cotton ball. We also took a 30-stem sample to check how close larva numbers were to the economic threshold. ISU Extension guidelines are to cut or spray when weevil larva numbers reach two per stem. We picked the 30 stems and shook them out into a white bucket to count them.

Kris' work has shown that a fungus can kill larvae in late May. Our plan was to wait until we had a large population of weevils and then harvest the hay. We left 12 feet standing along the perimeter of our fields, hoping this "reservoir" would concentrate the weevil populations and speed up fungus activity.

We sampled on May 16, 23 and 30, and June 12 (Figure 11). On June 14 we harvested, and we sampled the strip that was left on June 19. On June 16 we found six weevil larvae per 30 stems – much below the 2 larvae *per stem* threshold. Our rearing results showed that 40 percent of the weevils were expiring anyway. On May 30 the population climaxed at ½ larva per stem. The

following week we saw 75 percent of our captured larvae die. (Kris' numbers are somewhat lower. He was feeding greenhouse alfalfa.) We were not surprised when on June 12 the weevil larvae numbers had fallen back to six larvae per stem.

Because the wet spring had allowed the fungus to increase, our harvest procedure had little effect on the few remaining larvae. For the sake of the research, we hope 1996 presents us with a more typical weather pattern.

Toward July our weather did dry out, providing another pest, the potato leaf hopper, with a perfect environment to attack the post-harvest regrowth. Perhaps in the future biological control of this pest will also be possible.

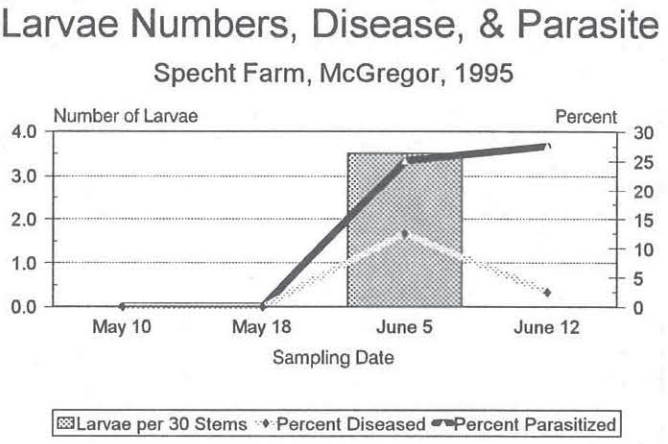


Figure 12. Alfalfa weevil larvae and their pests on the Specht farm in 1995.

Biological Control of Alfalfa Weevil – II

Phil and Sharon Specht, McGregor

Our project was getting local farmers involved in integrated pest management of alfalfa weevils. Entomologist Kris Giles worked with me to conduct the demonstration and collect data. I raised alfalfa weevil larvae in test tubes and noted deaths from fungal disease and two different parasites. I left a single swath of alfalfa unharvested on the west side of one field to see if this benefited the larval disease and parasites. Stem counts and sweeps showed very low numbers of alfalfa weevils all spring, and roughly half of them were dying (Figure 12).

In conversations with my neighbors, I realized there was universal acceptance of IPM techniques. There was some interest in the alfalfa strip I left unharvested; however, no one else volunteered to leave a strip. Many more people read the article in *Iowa Farmer Today*, and I was asked about it as I traveled to meetings statewide. The only down side was the article failed to mention PFI by name!

We had a successful field day on June 24, attended by 24 people. It was a very hot day, even under the 100-year old oaks, and we went through four gallons of milk donated by the co-op. Three families attended because of an add I took in the county paper. I was gratified by the number of Extension people in attendance. Tour stops included two solar design barns, one with sand stalls, where we looked at my handout showing economics of different feeding regimens. We stopped in the pasture for a look at paddocks for the intensive rotational grazing of 110 milk cows. We also discussed some CRP ground that was broken out early to graze 46 dry cows and heifers. And Kris Giles and I described our IPM research on alfalfa weevil.

Strip Intercropping

ISU agronomists Rick Cruse and Mo Ghaffarzadeh continue to work with producers to evaluate narrow strip intercropping (Table 9). In 1995, two farmers even planted double rows of corn in the strips, seeking to take advantage of the available sunlight with high planting populations (Figure 13).

Cruse and Ghaffarzadeh worked with Tom Frantzen and Steve Rash (not a PFI member) to evaluate twin-rows of corn. Final populations were not sufficiently high in 1995 to test the potential of this technique. The second planter pass damaged the seedbed created the first time through. If the principle of double rows ever proves sound, better equipment could be customized for the purpose.

Twin rows or not, in 1995 plant population presented itself as one of the next challenges. In three cases, an outside row of the corn strip exhibited a low yield that could be statistically associated

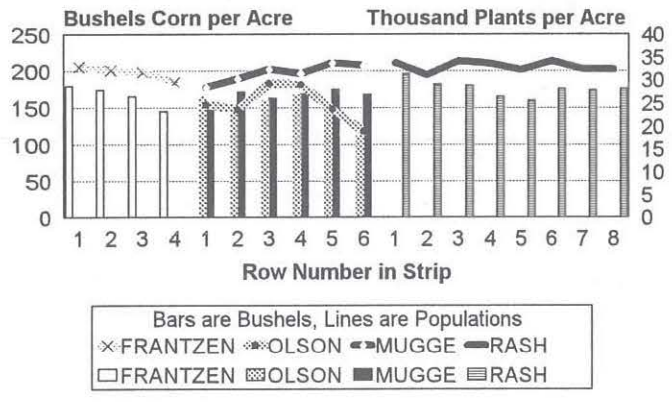
Table 9. NARROW STRIP INTERCROPPING TRIALS

COOPERATOR	CROP	CROP ROTATION	ROW DIRECTION	YIELDS (bu.)			COMMENTS
				STRIP	FIELD	DIFF.	
MUGGE	CORN	C-S-O	E-W	163.1	159.7	3.4	GRASSHOPPER DAMAGE IN NORTH ROW OF CORN STRIPS
MUGGE	SOYBEANS	C-S-O	E-W	50.1	55.0	-4.9	
MUGGE	OATS	C-S-O	E-W	68.0	73.1	-5.1	
MUGGE	CORN	C-S	E-W		153.5		CORN AND SOYBEAN YIELDS GREATER IN C-S-O THAN C-S
MUGGE	SOYBEANS	C-S	E-W		52.2		
OLSON	CORN	C-S-O	SE-NW	124.0	137.1	-13.1	STAND REDUCTION IN EAST ROW – STALKBORERS?
OLSON	SOYBEANS	C-S-O	SE-NW	41.1	48.7	-7.7	

with low stand: Tom Frantzen's row 4, Jeff Olson's row 6, and Paul Mugge's row 1.

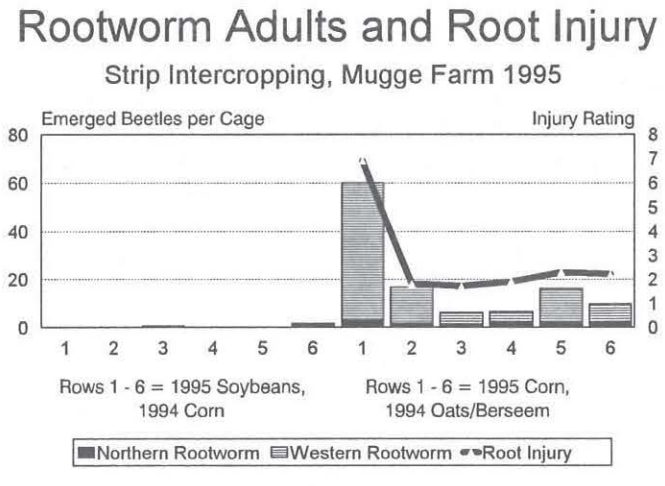
Row 1 was on the south side of the strip in the case of Mugge and Rash and on the west side for Olson and Frantzen. Row 1 was next to soybeans and the last row was next to oats for everyone but Rash, for whom it was reversed. Jeff Olson's row 6 exhibited numerous stunted corn plants. He suspects that stalk borers moved in from the foxtail in the adjacent oats/berseem strip. Paul Mugge's row 6 did not yield well, but not because of low stand. Grasshoppers moved over from the neighboring oats strip after finishing every blade of the oats reseeding.

Through Rick Cruse, Mugge also worked with Mike Ellsbury, an entomologist from South Dakota State University. Ellsbury investigated the possibility of rootworm damage in the strip system. He sampled the soil for eggs, trapped emerging rootworm beetles, and measured root injury at different locations in the strips (Figure 14). He found that,



Frantzen and Rash strips: double-planted rows.

Figure 13. Strip intercropping yields and stands by row.



M. Ellsbury, South Dakota State University

Figure 14. Emerging adults and root injury showing rootworm larvae migration.

He found that, while there were few rootworm eggs in the soil where corn was planted, western corn rootworm larvae* migrated underground *from the soybean strip into the first row of corn.

while there were few rootworm eggs in the soil where corn was planted, western corn rootworm larvae *migrated underground* from the soybean strip into the first row of corn. Root injury to the corn in that row (row 1) was significantly greater than in other rows of the strip.

Ellsbury believes rootworm damage is one reason row 1, on the south edge of the strip, did not produce a greater yield than other rows. From this year's work, it is impossible to know how common this problem is in strip intercropping, but Ellsbury's research demonstrates that rootworm larvae can migrate. Future trials will evaluate possible solutions, such as running a tractor wheel between strips to create compaction

SUSTAINABLE AGRICULTURE TRAINING UNDERWAY

Jerry DeWitt, Iowa Sate University Extension

The 1990 Farm Bill mandated that Extension and other education providers nationwide be trained in sustainable agriculture. In Iowa, selected field staff in Extension and Natural Resource Conservation Service personnel will be attending in-service training in March and April. Most County Extension Education Directors will be attending a special session in Des Moines on March 20.

Topics will include overviews of sustainable agriculture, successful models of programs at the local level, opportunities for activities and programs, information sources and more. The Directors with agricultural responsibilities will also receive in-depth technical information on weed management strategies, alternative livestock production systems, nutrient management, biological control, niche marketing/contracting, organic agriculture, HRM, ICM and more on March 21 and 22.

On April 8-10, Extension Field Specialists and key NRCS staff will be in Ames for three days of training. The topics will include not only general overviews of sustainable agriculture, but also techniques and strategies in crop and livestock production systems that are supportive of a sustainable agriculture. We will be placing notebooks and reference materials in the hands of staff for use in their offices and in the field for the future.

This is only the beginning of a commitment by ISU to better prepare Extension and other key education and information providers with workable and appropriate background knowledge in sustainable agriculture.

FOOTPRINTS OF A GRASS FARMER

Seasonal Pork In The Upper Midwest

Tom Frantzen, Alta Vista

Respect for nature is a principal concept in grass farming. Nature has deep pockets. Its evolutionary actions are continuous. When we structure our agricultural activities with little regard to these forces, we ignore the definition of a true economy. According to Webster, "economy" is the "harmonious management of the resources of a community." Note the key words ... harmonious and management. Dairy and beef cow grass farmers striving for real economy learn to align their livestock biology with the forces of nature. This is especially true in regards to the seasons.

Can we apply the examples of seasonal dairy and beef to pork? What promises could this hold for hog farmers in the upper Midwest?

Recently we completed a two-year analysis of our pasture farrowing agroforestry operation. This analysis included weights of livestock, records of supplemental feed, and details of the hours of labor for chores. Complete records were kept for three groups of bred sows that farrowed on narrow strips of pasture bordered by corn and belts of trees.

The bottom line reveals a pig producing technique that is low cost. A 35-pound feeder can be weaned from this setup with total expenses of $15. An entire litter takes about an hour's worth of labor during its time in the system. Both of these figures are far less than those found in modern confinement facilities. Timing of the breeding herd to match the seasons is the key cost-cutting ingredient.

This economy begins with ear notching gilts from superior litters born in August. When her weight approaches 125 pounds, and if her body characteristics are acceptable, she is removed from the fat hog herd and put on a limited diet. Whole high-lysine ear corn, baled hay, and mineral supplementation provide winter feed. If possible, she gleans corn stover. When the grass glistens in the spring sun, the developing gilts are part of the harvesting crew. By May 1, they are ready for breeding.

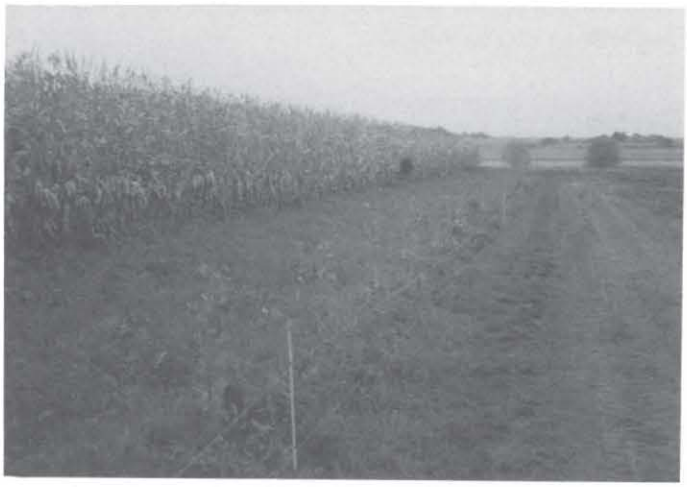
Bred gilts raised in a grazing cell with at least a dozen paddocks have performed well on our farm. The stock density (weight of animals per acre per day) should range from 60,000 to 90,000 pounds. Two pounds of whole ear corn and free choice minerals supplement the good quality pasture.

By August 1, the bred gilts are moved into the agroforestry pasture farrowing strips. Lush strips of alfalfa or red clover are combined with six pounds of ground corn and minerals to ensure the proper nutrition prior to farrowing. Each narrow strip accommodates six to seven litters. Careful management keeps the age of the baby pigs uniform in each strip. The adjacent corn strips provide shade during the August heat and physically separate each farrowing group. In September, the corn strip is harvested by the growing pigs and lactating sows.

Pigs remain with their mothers as long as it is practical. At weaning, the sows are moved to nearby corn stover. This seasonal farrowing produces a 30- to 40-pound feeder pig in the fall. Now what?

Winter brings severe weather in the upper Midwest. Small growing pigs need shelter. We accommodate those needs in older remodeled buildings. Hogs are finished in an open air Cargill facility. This arrangement has provided satisfactory performance. However, it does have drawbacks. The weaning-to-120-pound stage is done indoors on slats, with a liquid manure arrangement. These facilities are aging and require winter manure spreading. Our outside finishing lot is in good condition. But it requires, like the other facilities, winter spreading. Hauling manure in snow violates my quality of life. It also represents a major conflict with the economy we wish.

Recently we attended a Practical Farmers of Iowa field day. The tour showcased a low-cost hoop house finishing setup. This deep-bedded structure fills the housing needs of the growing finishing pig. The manure pack is covered and can wait for spring spreading. The strip pasture farrowing/hoop house finishing looks like a winning combination.



This corn is ready for the pigs to harvest it.

Hoop structures can be a low-cost way to finish hogs.

FROM THE KITCHEN

Marj Stonecypher, Floyd

Snow-snow everywhere! Seems like all we have been doing is dig out so we can feed livestock, then dig out so we can feed the livestock again. I know everyone else is having the same kind of fun we are, Ha! Think we will take off for Texas soon.

Have you got all your seeds ordered for spring? We have time to do it now? Well, I don't. I'm outside too much. Now that Tony is not our hired man, I have to help Ray a little more. I don't mind. He is a pretty nice guy to work with.

Here are a few quick recipes for when we get busy with spring work.

BBQ BEEF OR PORK

4 LB. BEEF OR PORK ROAST (I use half of each) cooked and pulled apart.

Mix together the following and simmer for 15 minutes.

14 oz. catsup
1 medium onion-diced
1 cup water
1 can tomato soup
1/2 Tbsp. dry mustard
2 Tbsp. brown sugar
1/2 cup diced celery
4 bay leaves
salt & pepper

Add meat and simmer on low for 1 hour. Put in buns for that hurried meal.

DUMP CAKE

1 30 oz. can sliced peaches
1 yellow cake mix
1 stick margarine or butter
1/2 cup chopped nuts

Spray 13 x 9 x 2 pan with Pam. Pour in can of peaches with juice.

Sprinkle dry cake mix on peaches. Melt margarine and pour over cake.

Top with nuts, if desired. Bake 350 degrees - 45 minutes.

(For a different taste, try apricots and butterbrickel cake mix or butter pecan cake mix.)

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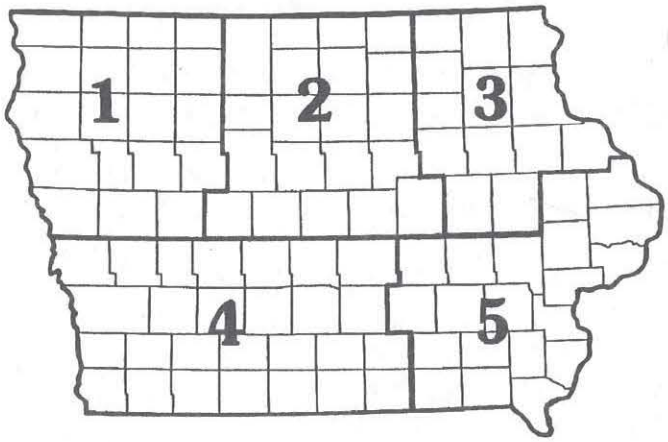

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