

# the Practical Farmer

Practical Farmers of Iowa Newsletter

Vol. 7, #1  
Spring 1992

## SPRINGING INTO 1992

Spring is a time for beginnings, and these days you may be up to your waist in spring beginnings! You also know that many spring seeds have to overwinter to grow. Practical Farmers of Iowa members have spent the winter developing some new seeds of their own. These are the seeds of ideas that germinate in winter meetings and in conversations. This issue of *the Practical Farmer* describes some of those new directions.

**Rotational grazing** has increasingly caught the interest of Iowa livestock producers. As described in these pages, PFI, in cooperation with the Leopold Center for Sustainable Agriculture, is embarking on a study of the productivity and profitability of intensive rotational grazing. You will also read an introduction to controlled grazing principles by cooperator Tom Curl, the announcement of a new PFI grazing club, and details of a beef and grazing field day coming up for northeast Iowa.

Intensive grazing is a subject that more and more farmers want to hear about. Mark your calendars for the PFI annual winter meeting, Thursday, January 7, 1993. The featured speaker will be H. Allan Nation, editor of the *Stockman Grass Farmer*, a national publication that is in the forefront of the grazing movement.

PFI members aren't always so caught up in daily affairs that they can't think about some of the broader issues, either. Several PFI members began thinking about **genetic conservation** after attending a meeting at the Seed Savers Exchange in Decorah last summer. The discussion has widened to include both crops and livestock. This issue includes a report of the northeast Iowa meeting with representatives of the Institute for Agricultural Biodiversity (IAB), a unique

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organization working to conserve heritage breeds. Expect to see some heritage seeds or breeds at PFI field days this summer.

And speaking of field days, here is the list of dates and places for PFI 1992 summer field days. A booklet containing full descriptions will appear in early summer. Last year's total attendance was nearly 1,800. You'll want to take advantage of these events to see how the spring seeds are growing!

## COOPERATORS SET 1992 FIELD DAYS

PFI cooperators met March 14 and 15 to plan for the year's trials and farm field days. They worked hard for the 1½-day meeting, but they also found time to socialize with researchers and PFI supporters from Iowa State University.

This year Practical Farmers of Iowa has gained cooperators in two new counties, each representing a collaboration with a local organization. Mike Natvig is a PFI member who belongs to the Howard County Soil and Money Savers (SAMS) Club. SAMS has an interest in tillage, soil conservation, and economics. By becoming a cooperator, Mike helps link PFI and SAMS, which can only benefit both groups.

Eric and Anne Pederson and Tom and Alesia Lacina are members of Farm 2000, in the



Between sessions at the spring planning meeting, cooperators found time to socialize and renew acquaintances.

Poweshiek County area. They will be sharing a "cooperatorship" this year. Farm 2000 has run out of the funding that supported Steve Hopkins a local coordinator, but members (including Steve) are continuing to function as a group. The organization shares information in many areas, from stress management to sustainable agriculture. They have a particular interest in intensive rotational grazing. PFI trials there this year will cover nitrogen management and weed management.

At the spring meeting, cooperators discussed economics with Dr. Mike Duffy, record keeping with Extension specialists John Creswell and Doug Henderson, nitrogen management with Fred Blackmer, strip intercropping with Rick Cruse, and forestry with Drs. Joe Colletti and Dick Schultz. Forestry? Schultz and Colletti are working with Rick Cruse to include trees in narrow strip intercropping. They are also researching streambank stabilization and other farm uses of trees. As a result of the discussions, several cooperators are planning projects that involve trees.

Here is the list of PFI field days and dates. Details will be included in the 1992 field day booklet, which PFI members will receive in early summer, and you can also call the phone numbers provided. In the mean time, don't forget about the first PFI field days of the season. They will be on the farm of Richard and Sharon Thompson, Boone. The May 4 field day will concentrate on cover crops and will include a demonstration of ridge-till planting. The June 15 field day will feature demonstrations of first cultivation of soybeans and ridging of corn.

### May 4 CENTRAL IOWA

Richard and Sharon Thompson, 2035 190<sup>th</sup> St.,  
Boone, 50036  
(515) 432-1560

### June 15 CENTRAL IOWA

Richard and Sharon Thompson, 2035 190<sup>th</sup> St.,  
Boone, 50036  
(515) 432-1560

**July 7 SOUTHEAST IOWA**

Larry and Joyce Conrad, RR 1, Box 103, Delta,  
52550  
(515) 624-2380

Jim and Vickie Striegel, RR 1, Box 109, Delta,  
52550  
(515) 634-2896

**July 22 SOUTHEAST IOWA**

Steve and Gloria Leazer, RR 2, Wilton, 52778  
(319) 785-4577

**July 23 CENTRAL IOWA**

Dick and Mary Jane Svoboda, RR 1, Box 130,  
Aurora, 50607  
(319) 935-3966

David and Lisa Lubben, RR 3, Monticello, 52310  
(319) 465-4717

**July 31 NORTHWEST IOWA**

Harlan and Sharon Grau, RR 2, Newell, 50568  
(712) 272-3692

Bob and Diane Graaf, RR 1, Palmer, 50571  
(712) 359-7787

Todd and Linda Hartsock, RR, Box 47, Rolfe,  
50581  
(712) 857-3426

**Aug. 4 SOUTHEAST IOWA**

Roger and Nancy Musselman and sons, (assisting  
PFI members) RR 2, Bloomfield, 52537  
(515) 664-3485 (h), 664-2730 (w)

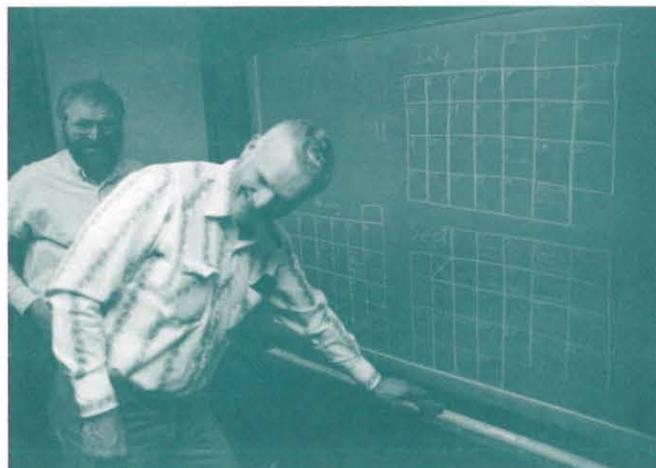
John and Pam Cowles, RR 2, Box 90, Bloomfield,  
52537  
(515) 675-3414

**Aug. 6 NORTHEAST IOWA**

Mike Natvig, RR 2, Box 215, Cresco, 52136  
(319) 569-8757

Ken and Adolph Humpal, (assisting SAMS mem-  
bers), Rt. 1, Box 81, Calmar, 52132  
(319) 569-8225

Jed Becker, (assisting SAMS member), Rt. 4,  
Cresco, 52136  
(319) 547-5419



The field day calendar filled up as cooperators spoke for dates at the spring meeting.

**Aug. 7 NORTHEAST IOWA**

Lynn Stock, RR 2, Box 12, Waukon, 52172  
(319) 568-3211.

Mark and Debra Palmer, RR 1, Box 112, Waukon,  
52172 (assisting PFI members)  
(319) 568-4247

**Aug. 10 NORTHEAST IOWA**

Ray and Marj Stonecypher, RR 1, Box 127, Floyd,  
50435  
(515) 398-2417

Tom and Kathy Curl, RR 2, Box 173, Ionia, 50645  
(515) 228-2089

**Aug. 12 CENTRAL IOWA**

Tom and Alesia Lacina, RR 2, Box 9, Grinnell,  
50112  
(515) 236-6668

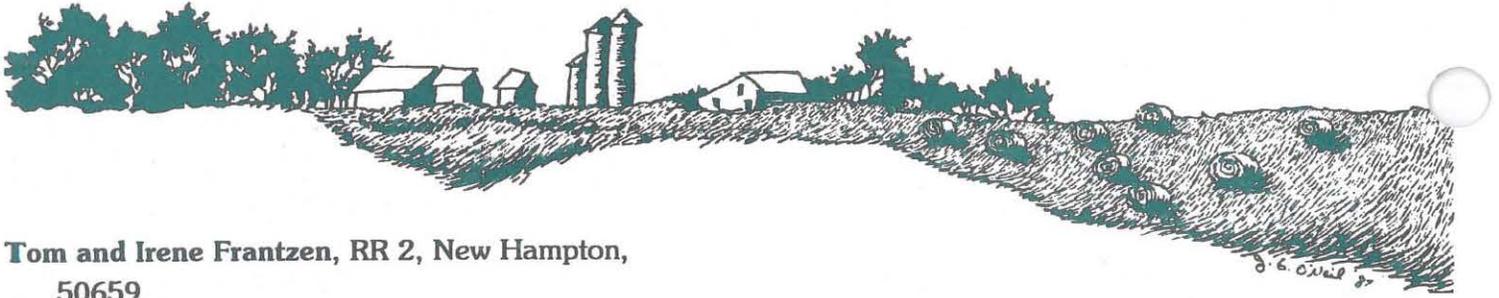
Eric and Anne Pederson, RR 2, Box 8, Grinnell,  
50112  
(515) 236-5060

**Aug. 14 SOUTHEAST IOWA**

Jeff and Gayle Olson, RR 2, Box 147, Winfield,  
52659  
(319) 257-6967

**Aug. 19 NORTHEAST IOWA**

Mike and Jamie Reicherts, RR 1, Box 32, New  
Hampton, 50659  
(515) 364-6776



**Tom and Irene Frantzen, RR 2, New Hampton,  
50659  
(515) 364-6426**

**Aug. 28 NORTHWEST IOWA**

**Paul and Karen Mugge, RR 2, Sutherland, 51058  
(712) 446-2414**

**Doyle and Sheryl Wilson, Lowell and Eunice  
Wilson, RR 1, Box 54, Primghar, 51245  
(712) 757-1874**

**Ag. Stewardship Center, Dordt College, Sioux  
Center, 51250  
(712) 722-6285**

**Sept. 2 SOUTHWEST IOWA**

**Vic and Cindy Madsen, RR 3, Audubon, 50025  
(712) 563-3044**

**Ronald and Maria Rosmann, RR 1, Box 177,  
Harlan, 51537  
(712) 627-4653**

**Sept. 4 NORTH CENTRAL IOWA**

**Don and Sharon Davidson, Box 424, Holland,  
50624  
(319) 824-6347**

**Doug Alert, RR 2, Sheffield, 50475  
(515) 579-6183**

**Allyn and Laura Hagensick, RR 4, Box 57, Hamp-  
ton, 50441  
(515) 456-2945**

**Sept. 9,10 CENTRAL IOWA**

**Richard and Sharon Thompson, 2035 190<sup>th</sup> St.,  
Boone, 50036  
(515) 432-1560**

**Sept. 11 TRAIN THE TRAINERS WORKSHOP**

**Richard and Sharon Thompson, 2035 190<sup>th</sup> St.,  
Boone, 50036  
(515) 432-1560**

## LEOPOLD CENTER FUNDS ON-FARM RESEARCH AND DEMONSTRATION

The Leopold Center for Sustainable Agriculture has funded the first year of a two-year project for PFI trials and field days on three topic areas. These areas are narrow strip intercropping, intensive rotational grazing, and manure management. The grant totals \$17,968.

PFI cooperators will work closely with three Leopold Center issues teams on the project. Issues teams are interdisciplinary, problem-solving committees that mediate research priorities for the Center. Cooperators working with these three issues teams will go to some lengths to gather information on their systems.

Economic record keeping will be a big part of the grazing and strip intercropping work. In coop-



At the Leopold Center conference in February, PFI President Tom Frantzen shared his experience of agriculture in Latvia.

eration with the Cropping Systems Issues Team, cooperators will track strip intercropped fields with the Crop Enterprise Recordkeeping System. Working with the Livestock Systems Issues Team, cooperators will monitor the success of intensive grazing systems with the Beef Cow Business Record. These record keeping programs are used by farmers in a variety of systems, so the numbers generated will provide some good comparisons of these alternative production systems to "the farm down the road." Finally, in cooperation with the Animal Waste Management Issue Team, cooperators will keep records of time spent on various components of manure handling, such as loading, hauling, and spreading. These data are needed for valid and reliable estimates of the economic value of manure.

Additional activities that will result from Leopold Center funding are: PFI field days associated with the above research; evaluations of the effectiveness of these field days; and assessments of the usefulness of the collaboration between PFI cooperators and researchers. Field days will be evaluated through mail surveys of attendees. The collaboration between PFI cooperators and researchers will be evaluated through group interviews next winter.

The cooperation that will be possible through the Leopold Center grant should continue the successful pattern of collaboration between farmers and researchers that PFI has pursued in past years.

## PFI RECEIVES RIDGE TILLAGE GRANT FROM LISA

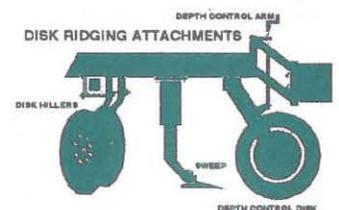
Practical Farmers of Iowa has received support from the federal LISA program to conduct a two-year project of research and demonstrations of ridge-till farming practices. LISA, which stands for Low Input Sustainable Agriculture, is a competitive grants program of the U.S. Department of Agriculture.



The National Ridge Till Conference drew farmers and researchers to Sioux City last winter.

The nearly \$76,000 grant will support a range of field days and on-farm trials relating to ridge-till in the 1992 and 1993 cropping seasons. Trials will include comparisons of nitrogen fertilizer rates, starter fertilizers, methods of weed management, tillage comparisons, cover crops, and narrow strip intercropping. In a number of these areas PFI cooperators will work with Iowa State University agronomists, thereby increasing the "information yield" from the trials. The effectiveness of field days will be tracked with mail questionnaires and by the evaluation of farmer focus groups.

In five years of on-farm trials, PFI cooperators have established the utility of ridge tillage in sustainable agriculture. As compliance deadlines for the 1990 Farm Bill approach, Iowa farmers are in need of practical methods to save soil, energy, and money. These on-farm demonstrations will bring solutions to the public in the form of local, replicated on-farm trials around the state and through field days and other opportunities for individual learning. A number of Extension Service agriculturalists provided letters of support for the project proposal, and the project will contribute to their efforts to realize program goals in soil conservation, sustainability, and profitability.



## WINTER MEETINGS AROUND THE STATE

### NORTHWEST DISTRICT POTLUCK MEETING

About 46 people attended the PFI northwest district winter meeting, which took place Feb. 29, at the Stubs Ranch Kitchen in Spencer. After enjoying the smorgasbord, participants listened to Tom Frantzen describe his trip to farms in Latvia last year. District director Bob Graaf reports there was "lots of discussion," and that people related many of Tom's experiences to their own farming situations.

District members also were invited to bring slides and stories to share. Colin and Carla Wilson rose to the occasion, showing slides of their pasture farrowing operation.

### NORTH CENTRAL POTLUCK MEETING

The north central district of Practical Farmers of Iowa held a winter meeting on February 22, in the Trinity Lutheran church, in Hampton. The roughly 28 people who attended took the opportunity to catch up on news since they last met. The meeting began with a potluck dinner. Following the dinner, Tom Frantzen gave a presentation on his trip to the Baltic states last summer. The talk stimulated some interesting discussion. Allyn Hagensick then gave a short presentation on his greenhouse and the production of tomatoes, and Don Davidson described his field trials in 1991 and his plans for this year. The conversations continued for some time after the meeting was adjourned.

### SOUTHEAST IOWA DISTRICT MEETS

The PFI Southeast District meeting took place Feb. 25, at Iowa City, with 18 members in attendance. Jeff Olson was elected as Southeast Iowa PFI District director.

Gary Johnson from Hutchinson Farm Management showed slides and told of his group's success with low cost hog operations in Henry County, Illinois. Pasture farrowing with a structured job calendar and modest buildings allow many of the livestock share operations to prosper better than the more intensive, high-cost confinement hog farms in their area.

Hans Peter Jorgensen and Shan Thomas, from the Institute for Agricultural Biodiversity at Decorah, Iowa gave a slide presentation about heritage breeds and their conservation. They discussed the problems of maintaining the pure-breeds. In some cases valuable genetics are being lost as owners try to survive tough times by cross breeding herds to increase productivity. In many cases these breeds do have traits that can benefit production herds.

### SOUTHWEST IOWA DISTRICT MEETS

The annual meeting for the southwest district was held on March 27, in Audubon. The evening began with a potluck supper. Marco Buske, Extension area agronomist, then presented information from the water quality project at the Desoto Bend Wildlife Refuge.

Next, we reviewed our Low Cost Producer project. 1991 was our first year for this record keeping exercise. Kurt Johnson had the lowest costs for both corn and soybeans. Kurt led a discussion about his crop production system. He no-tills, and he used a combination of low machinery costs and conservative fertilizer and pesticide rates along with the good weather to produce excellent yields at low cost.

The Low Cost project would welcome more entries for the 1992 crop year. All numbers are kept confidential. For information, contact Vic Madsen (712) 563-3044.

## GRAZING CONFERENCE HELD, NORTHEAST IOWA GRAZING CLUB FORMED

Tom Frantzen, New Hampton

On Jan. 16th and 17th, a planned grazing conference was conducted in Northeast Iowa, at North Iowa Community College, in Calmar. The Land Stewardship Project, the Organic Information Network, and Practical Farmers of Iowa were the sponsors. Fourteen farmers attended both days of the program. The group's enthusiasm was apparent in their willingness to come early and stay late each day. Brian Lang, Northeast Area Extension crop production specialist, assisted in the first day's session. Richard Ness, director of MRW Services, based in Lewiston, MN, directed the program, taking great care to emphasize beginning concepts.

The second day's program inspired the creation of a PFI Northeast Iowa Grazing Club. The club's goal is to promote excellence in grazing on a farmer to farmer basis. The club's activities will include informal farm grazing tours and a winter classroom-style grazing course, probably held at the North Iowa Community College. Some of the PFI membership dues money may be used to buy videos and books on grazing, which will become a "traveling" library. Materials may be signed out through Tom Frantzen free of charge on a short term basis. A report on grazing activities will appear in the PFI newsletter. Grazing farmers in northeast Iowa want to work together, and cooperative interaction through the club will enable them to improve their grazing management. For more information, contact Tom Frantzen, (515) 364-6426.

## GRASS PRODUCTIVITY -- GRAZING PRINCIPLES BY ANDRE VOISIN

Tom Curl, Ionia

For anyone serious about the efficient utilization of forage by livestock, *Grass Productivity*, by

Andre Voisin is a must. This book, a classic written decades ago, is an extremely comprehensive collection of information on grazing. It covers many different grass management theories -- what is good about them and what is wrong with them. Mr. Voisin did an excellent job of presenting a wealth of data and personal observations on how grass grows, the nutritional requirements of ruminant animals, and how they interact with each other. Voisin (pronounced "vwaSEEN" in his native France), was among the pioneers of what today we loosely refer to as rotational grazing.

Most of us grew up knowing only continuous grazing -- putting a set number of animals on a set number of acres of grass and leaving them there the entire season. The livestock would wander the entire area, eating what they wanted and leaving what they did not. Usually there would end up to be areas grazed down to practically bare ground and other areas with tall dead grass that livestock refused to eat unless starved. This type of grazing management killed out desirable plant species and allowed undesirables to take over. Many people were aware of the inefficiency of this kind of grazing and tried many remedies. These included heavy fertilization, spraying, plowing and reseeding, and some attempts at different grazing management.

(Continued)



Tom Curl (right) showed visitors around his paddocks at the field day last summer.

(Grazing Principles, continued from page 7.)

Frenchman Andre Voisin developed his own style of grass management, which he calls "*rational grazing*," implying a degree of rationality or common sense on the part of the manager.

In this rational grazing, a pasture is divided into numerous smaller paddocks. The stock are moved around from one paddock to the next, encouraging them to harvest all the forage in each. The difference between rational grazing and other grass management systems is the flexibility of the time the grass is given to recover after being grazed. During the early part of the growing season, the grass does not require very much time to recover. However, as the season progresses and the grass grows more slowly, it requires more time. If forage is not given the proper time to recover (either too much or too little), the performance of both the grass and the livestock will suffer.

One method used to adjust the time of recovery between grazings is to remove some of the paddocks from the rotation during times of rapid growth. Hay is then made from these paddocks, and they are returned to the rotation when more paddocks are needed. Mr. Voisin found that with this type of management, desirable species and excellent productivity returned without the help of costly spraying, plowing, and reseeding.

Andre Voisin's Laws of Rotational Grazing are:

1. To achieve maximum productivity and be capable of a vigorous spurt of regrowth, grass must be allowed sufficient time between grazings to accumulate root reserves. Consequently, the necessary time between grazings varies with the season, climatic conditions, and other environmental factors.
2. The total time spent on a paddock during a rotation should be short enough that the plant bitten on the first day is not bitten again on that rotation.

## NESTING IN CONTROLLED GRAZING

Randy Nowotny, Victor  
with assistance from Ann Krush

Birds need proper habitat to nest. This habitat can be provided for non-game birds in a controlled grazing pasture without incurring extra feed costs, and the cattle are more docile for the extra attention they receive in controlled grazing.

Our controlled grazing pasture is 16 acres divided into 12 paddocks. Each paddock has a cross wire available to partition off one day's worth of feed. Adjoining the pasture on the north is CRP land; to the east is a continuously grazed pasture; to the south is corn; and to the west is hay. In June, 1991, we baled 1½ paddocks for slow-season feed. No off-pasture feed was fed to our 15 cow/calf units until the latter part of August.

With good ground cover, birds have a chance to breed and raise little ones. The areas we left for nesting were: 1) the back half of paddock #12, in which there were no cattle from March until September; and 2) the area around the ponds.

The grasses in paddock #12 were 1½-2 feet high. After May's grazing we left another small area in paddock #10 for birds that need short grass. There a ground sparrow was noted in the 6-to-10-inch grass. Depending on the grass types in the pasture, and with a good understanding of grass growth, timed grazing can furnish the heights of grass needed by various birds.

In June a local naturalist viewed the pasture. Birds noted included kingbird, goldfinch, sparrow hawk, and meadowlark. The naturalist also noticed evidence of bluebirds nesting in the boxes provided at the edge of the pasture. In 1991, for the first time, we had a hatch of Canada geese on our pond.

3. Animals with the greatest nutritional requirements must be helped to harvest the greatest quantity of grass of the best possible quality. The less "scraping" imposed upon the animal, the more grass it harvests. As a rule of thumb, six-inch high grass in permanent pastures (perennials), and nine-inch high grass in temporary pastures (annuals) allows cows to harvest the maximum high quality forage.

4. For a cow to give regular milk yields, she must not stay any longer than three days on one paddock. Maximum yields are achieved if cows stay on a paddock only one day.

Although rational grazing is not a cure-all for making money with livestock, it is a very useful tool to increase productivity and profits. I would highly recommend *Grass Productivity* to anyone grazing or planning to graze any class of livestock.

## N. IOWA TWILIGHT BEEF TOUR

On June 25, the Floyd and Chickasaw County Cattlemen's Associations and Iowa State University Extension will sponsor a twilight beef tour in Floyd County. The three farms to be visited are each pursuing strategies to limit purchased inputs, increase profitability, and benefit the environment.

The tour begins about 3:00 pm at the farm of Tom and Kathy Curl, RR 2, Box 173, Ionia, 50645, (515) 228-2089. The Curls intensively graze about 100 acres, and their goal is to sell calves equivalent to half the cow's weight each year.

Next on the tour is the farm of Ron McGregor. His 100-plus beef cow herd is maintained using a.i. and good forage management. The goal for the livestock is to derive per-acre returns equivalent to those under row cropping.

Roy Bierschenk's farm is to be the third stop. The operation lies in a water quality pilot area, and

a manure application plan has been developed for the farm. A settling basin has been constructed next to the feedlot to trap nutrients and preserve water quality. A nutrition monitoring system is used in the operation. Corn gluten, pasture, and forage are utilized, and a cornstarch preservative for big bales is being tried.

The tour will wind up at the Nashua City Park, where a meal will be provided. For details, contact Karl Griffith, Extension livestock production specialist, at (515) 424-5432.

## PFI EDUCATION PROGRAM UPDATE

by Gary Huber

Work on the new PFI education initiative is progressing. This article will inform PFI members of progress with two components of education initiative: 1) activities at the 4-H Education and Natural Resources Center near Madrid; 2) progress with the youth mentoring program. Future updates will inform PFI members on progress with other components of the education initiative.

### *4-H Education and Natural Resources Center*

One element of the education initiative is to establish sustainable agriculture practices on the 160 acres of cropland that are part of the 1,100-acre 4-H Center, and then highlight these practices to the nearly 9,000 youth and adults who use the Center each year. A variety of activities are being done to accomplish these tasks.

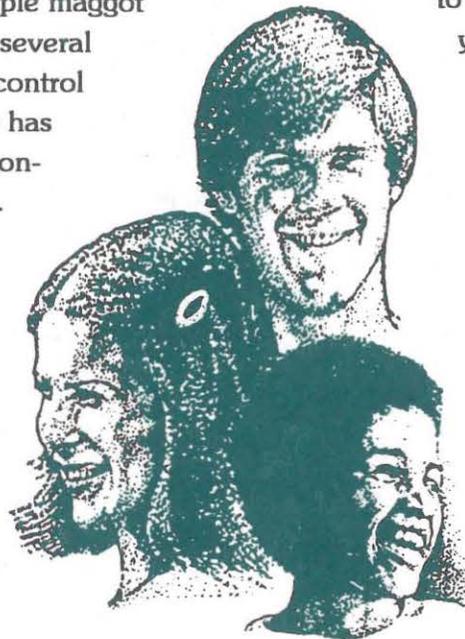
We are working with the tenant and Hertz Farm Management, which manages the property, to switch two fields totalling about 50 acres to ridge tillage this year. These fields will be planted conventionally this spring, and then a ridge-till cultivator will be used this summer to build the ridges. Next spring a ridge-till planter will be used to plant these two fields. The hope is that switch-

ing these fields to ridge tillage will protect the soil and allow reduced herbicide use in future years.

There will also be a one-acre demonstration plot of narrow strip intercropping near the entrance of the Center. The orientation of the rows will be perpendicular to the entrance to allow visitors easy viewing of the oat, soybean, and corn strips. Beyond switching some fields to ridge tillage and establishing the narrow strip intercropping demonstration, the late spring soil nitrate test will be used to adjust nitrogen rates, Integrated Pest Management (IPM) techniques will be used to monitor crop insects, and worm counts will be taken to establish a base line for worm populations in the Center's crop land, wooded land, and grass land.

The Center also has several apple trees near the main camp. Individual ball traps will be used on some trees to monitor apple maggot populations, while on other trees several traps will be used as a "trapout" control method. Additionally, the Center has a garden that will be used to demonstrate IPM techniques for gardens.

To highlight these practices to visitors, a summer intern has been hired to lead tours of the various practices. Also, on Tuesday, September 8, an event titled "Soil, Water and Wildlife: A Land Management Field Day" will be held at the Center. Beyond PFI, organizations helping with this event include the Leopold Center, ISU Extension Service, SCS, DNR, Successful Farming magazine, and Hertz Farm Management. (The PFI summer newsletter will contain more on this field day.)



### Youth Mentoring Program

The youth mentoring program is being conducted with the Iowa Association of Soil & Water Conservation District Commissioners. The idea is to link PFI members or SWCD Commissioners with youth in one-on-one relationships centered around sustainable agriculture projects. The desire is more than to teach youth about sustainable agriculture, but to develop nurturing relationships that help young people grow in their sense of caring for soil, water, woodlands, wildlife, and other natural resources, not to mention neighbors and people in town.

Over a hundred PFI members and SWCD Commissioners were sent letters about the program and "Mentor Assessment Forms" to complete and return. The forms asked why they wanted to be a mentor, what they had to offer young people, and how much time they could give a young person. Thirty-seven completed and returned the forms, and of these 34 verified over the phone that they wished to proceed with finding a student they could be paired with. The people who said they would be mentors are remarkable. Most were farmers, but with very diverse operations and interests. Others were researchers, teachers, SCS employees or private business people.

Next comes identifying interested students. Local 4-H leaders and ag education instructors are helping locate these students. Once a potential pair is located, a meeting between the mentor, the student, and the student's parents is held. A "development plan" is created at this meeting based on the student's interests. The plan describes the type of activities to be pursued and the frequency of contact. Also included is a "no-fault conclusion clause."

Then the actual mentoring activities take place. The types of projects may involve things as simple as planning a farmstead windbreak, or as complex as developing a marketing plan for an alternative enterprise, such as greenhouse tomatoes.

Finally, an individual has agreed to fund up to four \$500 awards to students involved in the top mentoring pairs statewide. The money must be used to further the young person's education, and a committee will be established to review and select the recipients.

## 1992 FFA SUSTAINABLE AGRICULTURE WINNERS ANNOUNCED

The PFI Board of Directors initiated an FFA award last year to help advance sustainable agriculture among Iowa's youth. At the FFA Leadership Conference in Des Moines on April 2, Eric Cherne of Guttenberg received the first place award and Aaron Balderstein of Central City received the second place award. Both young men made exceptional contributions to the sustainability of their families' farms by completing a variety of projects.

Eric Cherne said in his application, "Since our farm is situated on top a hill in northeast Iowa, we have a need for many sustainable farming practices. We have become very conscientious of ways that we can improve our land and facilities." Eric's contribution to the sustainability of his family's farm last year involved various soil conservation activities, including seeding the backslopes of some terraces and helping build two new terraces to control barnyard runoff. He also laid out some fields for contour stripcropping, and he worked with his father on using no-till on 100 acres.

Eric's activities did not end with trying to conserve the soil on his family's farm. To reduce energy use he installed 40 watt heating elements in



Gary Huber (center) presented the PFI-sponsored sustainable agriculture awards to Eric Cherne (left) and Aaron Balderstein.

the nipple waterers of a modified open front hog building, and he installed tarps in a gestation building to reduce heat losses. In addition, he planted a one-acre farmstead windbreak that will also serve as wildlife habitat.

Eric also sought out ways to reduce the amount of nitrogen used on their corn ground. "We found a company that sells nitrogen test kits and we purchased one that we use when the corn is 8 to 12 inches tall. This way we reduce our initial costs at planting time, and we apply additional nitrogen only if it is needed." In addition to using the late spring soil nitrate test, Eric spread manure over 180 acres of cropland last year.

Aaron Balderstein's contribution to the sustainability of his family's farm near Central City during the last year was equally impressive. He helped build a modified open front hog house using logs from an old grove "to save on resources and dollars." He built a sheep grooming stand out of scrap materials "to save costs." These activities show that Aaron knows about the importance of using the resources one has on hand.

Aaron also utilized controlled grazing by rotating their ewe flock from one section of the pasture to another, which Aaron said "increased the useful life of the pasture." He also noted that with timely

animal care practices he reduced animal stress and improved efficiency.

Aaron also helped establish a windbreak around the farmstead. On the farm's cropland, he lowered herbicide use with a rotary hoe and by using a wick bar to apply chemicals. Aaron said these practices "stopped the general broadcast spraying and allowed me to spot treat trouble areas." He also used reduced tillage on 60 acres of corn and soybeans, and he waited for proper soil conditions before doing tillage to decrease the number of trips over the fields.

Both Eric and Aaron fit in well with PFI farmers. "I have learned many things by practicing sustainable agriculture, and I have many more ideas to improve our land and facilities," Eric summarized his experience. Aaron said, "My program in sustainable agriculture is the result of attempting to reduce costs and improve efficiency, and at the same time improve the quality of the environment and the life of those around me."

## NORTHEAST MEETING DISCUSSES PRESERVATION OF BREEDS

On Saturday afternoon, January 4th, eight PFI cooperators from the northeast region met in Decorah with the co-directors of the Institute for Agricultural Biodiversity (IAB). The purpose of the meeting was to explore possible ways PFI and IAB could work together to preserve genetic diversity in agriculture.

The meeting started with a brief presentation by Peter Jorgensen and Shan Thomas, IAB's co-founders. You may remember Peter and Shan from their appearance at the Rodale "Take Charge" workshop that was held at Seed Savers Exchange last June. That workshop, entitled, "Sustainable Farming and Genetic Resource Preservation," featured speakers from the Seed

Savers Exchange, PFI and IAB. (Reported in *the Practical Farmer*, Vol. 6, #2, Summer of 1991.)

To start the discussion, Peter and Shan described why the preservation of diversity is important to everyone in agriculture, especially sustainable farmers. Agricultural genetic resources are as critical to sustainable farming as healthy soil. The information contained in the genetic makeup of crops and livestock may hold the answer to many of the questions being raised about sustainable systems.

Yet many varieties of crops and breeds of livestock are vanishing right before our eyes. This is a complex problem that can only be solved through many people and organizations working together. There is a role for farmers as well as government, corporations, and universities.

IAB is dedicated to finding ways to preserve diversity on farms. PFI has led the way in on-farm research and demonstration. Those at the meeting thought it is exactly these two areas where IAB and PFI might be able to work together.

1. On-farm research: Intensive grazing and pasture farrowing are being tested as sustainable ways to raise livestock. If you have ever tried either of these techniques, it doesn't take long to realize that it takes more than electric fence and a calendar to make it work. Obviously, some types of cattle and hogs are better foragers than others, and some varieties of plants are better suited to forage based systems.

Recently people raising some of the endangered breeds of livestock have recommended their breeds as the ones suited to these grazing methods. In many cases they may be right, but rarely is there any hard data to verify their claims. Therefore, can we design on-farm research that looks at the forage efficiency of some specific breeds of livestock?

## GENETIC PRESERVATION ON FARMS

Tom Frantzen, New Hampton

Zoos and laboratory storage of embryos are inadequate methods for genetic conservation. "Real life" preservation of genes requires a real life world for these species to live in. For example, let's say a disappearing breed of swine is "preserved" in a zoo, far removed from any farm. Years later that breed's genetic traits become of commercial interest. Attempts to reintroduce the species to the farmers fail repeatedly. Why? Because the animal became adapted to the zoo and lost its ability to survive in the real world. In the meeting Shan and Peter detailed several examples where this has already happened.

Our brainstorming exposed several excellent opportunities for PFI and the IAB to work together. We plan to survey PFI members about their interest and potential abilities to foster genetically endangered breeds. At the meeting we agreed to a goal of at least one on-farm project with both cereal grains and livestock on a PFI cooperator's place for this year. We hope for more developments in the future.

2. On-farm demonstration: A convincing argument can be made to preserve live animals and plants as well as frozen storage of seeds and semen. To keep cereal grain seed viable, it must be grown out on a regular basis. There is also a need to establish a coordinated method of keeping certain types of livestock alive. Of course, growing out grain is a little easier and less expensive than keeping a few head of hogs or cattle. But there are ways to do both.

On-farm live animal conservation is being done in Europe, Latin America and Canada, so we have some models to try and some conservation research to guide our attempts. What would it take



Hans Peter Jorgensen, co-director of the Institute for Agricultural Biodiversity, with naturally mating Bronze turkeys. These turkeys are the improved variety created in the 1930's and are the basis of modern "industrial stocks." Today all turkey breeding stock in North America is controlled by four companies, and all of that stock is closely related. (Source: Dr. Roy Crawford, "Status of Poultry Genetics Resources in North America," in Conference Proceedings, 1986 AMBC annual meeting.)

to keep a small number of animals within a coordinated program of farms here in the States? Working together on a demonstration, could IAB and PFI answer that question?

The discussion with Peter and Shan lasted for four hours and was still going on outside when the meeting room was locked and dark. The consensus of the meeting was that there is real interest in finding ways to conserve agricultural diversity on-farm, particularly livestock.

We all left the meeting encouraged that some exciting new projects are possible. Peter and Shan will be developing specific suggestions over the next couple of months. They will be working primarily with northeast region cooperators, but they welcome input from any PFI member.

If you would like to schedule a similar meeting or want more information, contact PFI Northeast District Director Tom Frantzen at (515) 364-6426 or Peter and Shan at: Institute for Agricultural Biodiversity, R.R. 3, Box 309, Decorah, IA, 52101, (319) 382-5947.

## NATURAL SELECTION, THE NEEDLE, AND RARE BREEDS

-- Anita Evangelista ©1992

(Editors' note: The author of this article is Anita Evangelista, a writer who lives in Peace Valley, Missouri. It has appeared in a number of publications for rare breeds and sustainable agriculture, and it relates to issues that some PFI members are thinking about these days.)

The last three 1989 issues of *Reason* magazine carried think pieces on modern agriculture by Karl Zinsmeister. Aside from his rampant technophilia (an unreasoning love of all things technological), Mr. Zinsmeister has somehow gotten it into his mind that modern ag is the pinnacle of the ongoing human relationship with the soil and livestock. Almost all of this is understandable and forgivable — given that Mr. Zinsmeister resides in D.C. and spends his days processing words as a researcher in a think tank and probably has little contact with livestock except at meals.

But a single line in his December piece glowed with error: "Farm animals are becoming healthier and more efficient." Excuse me a moment while I take this needle of wormer out to take care of a handful of Targhee sheep that are currently suffering from parasites. I'll be right back, after I give them their tetanus, overeating, vibrio, blackleg, epididymitis, and foot rot shots.

Sound familiar? The typical modern commercial livestock producer uses an unbelievable array of vaccinations and antibiotics to produce this "healthier livestock." Meanwhile, standing off to one side eyeing this unpleasant business is my

smallish flock of Jacob sheep, a minor breed noted primarily for its black-spotted fleece and rather spectacular horns.

The Jacobs don't get to participate in this shoot-'em-up saga. Strangely enough, this non-commercial breed doesn't seem to be affected by these disease scourges, at least not in my flock. They eat in the same field as the commercial breeds yet don't develop worm problems; they get a nibble of the grain that the commercial sheep must have — yet don't show, signs of excessive weight gains or enterotoxemia; they slog through the goo and mud in the rainy season, but their hooves stay strong and solid.

So, Karl, how come the "healthier" commercial sheep are always sicker and more susceptible to disease than the old-fashioned breed? How come, if the commercial sheep are "more efficient," I've got to feed tons of grain to them in the winter and spring so that they can produce healthy lambs — while the heirloom sheep get by and produce strong lambs on hay?

### Unchecked Selection

What we see here is the obvious effect of a hidden selection pressure, one that has run unchecked through commercial livestock production for the last two generations.

In the known history of human use of livestock, roughly 12,000 years, there were no antibiotics until about 50 years ago. For 12,000 years there were no vaccines, no ultrasound, no embryo transplants, no chemical dewormers, and very, very little preventive medicine. If a sheep — or a cow, horse, pig, dog, you name it — got sick, there were only three options: treat it with a dose of herbs and clean pasture; destroy it; or let it die. Herbal remedies may or may not have worked. Destruction was preferred if the animal carried something contagious. More often the animal was left to go through it on its own ... if it died, well, too bad. If it lived, fine.

Pretty callous attitude, right? After all, we're much kinder to our animals — we protect them from life's hard knocks, the pain of life-threatening illness. For the sake of our income, we try to ensure that every bred female will bear live, healthy babies by giving an assortment of shots, abundant grain and quality hay. We're so kindly to our animals that we're beginning to produce strains of livestock that *must* have vaccinations, that *must* be wormed often, that *must* have medicated feed, that *must* be assisted at birth.

Think of it like this: every time you pick up the needle to give a shot, you make a choice, a selection. Without realizing it, you purposefully perpetuate a weakness in your livestock. When I give a shot to protect my commercial sheep from vibriosis (premature birth or abortion) for example, I'm not just preventing a disease — I'm making sure that animals that might have died, the ones lacking a natural immunity to vibriosis, live and reproduce. A percentage of their babies won't have immunity, either. If I keep using the shot, I will create a vibrio-susceptible flock. Livestock producers select for other traits by the same process.

Now, imagine this happening nationwide, worldwide ... all across the board in commercial and pet animals of every type. Cows that must have calves pulled at each birth are kept because they are too valuable to get rid of; sheep with unresponsive foot rot are treated and treated, too valuable to destroy; breeding horses that founder annually are kept moving with cortisone, too valuable to put down; show dogs with epilepsy, hip dysplasia, genetic blindness, viciousness, stupidity, too valuable to ignore stud fees.

### Humane Selection

I'm not suggesting, even remotely, that livestock owners should stop vaccinating. Because we have already developed breeds that are chemically-dependent, the devastation from that course



Not all livestock in danger of extinction are uncommon varieties. Many are formerly popular breeds like the Shorthorn. These cattle were first imported into the U.S. in 1783. They served as a triple-purpose animal, providing milk, meat, and draft power. Milking Shorthorns are being "improved" by the introduction of other dairy breeds' genes, and pure bloodlines are increasingly rare.

would be enormous. I'm not advocating that a sick animal be deprived of the curative wonder of antibiotics, nor that a beast in a difficult labor be ignored.

What I am suggesting, though, is a careful reassessment of our day-to-day selection habits with an eye toward what type of livestock we wish to pass on to future generations. This is particularly important with our rare and minor breeds. These animals were willed to us by our farming ancestors with the truly valuable traits intact: hardiness, disease resistance, thriftiness, ability to live on marginal land, reproductive vigor. At this point, we're passing on to our children commercial animals that must be accompanied by syringes, pullers, artificial insemination scopes, and a pack of high-tech gadgetry. We could very easily do the same with our rare and minor breeds.

When natural selection is given a free hand, the result is feral animals. Of sheep breeds known to have been feral for many generations, such as the Santa Cruz Island flock, and the Hog Island sheep, the animals are all exceptionally hardy. They rarely have lambing problems, because

generations ago any ewe that couldn't get a lamb out died. End of line, end of weakness. (A typical commercial shepherd may have to assist 30% of his sheep's births.) They seldom develop foot rot, even on infected ground, because the sheep that were susceptible to it died and failed to pass the debility on. They're remarkably tolerant of parasites, because the sheep that couldn't handle a worm load died, so only the sturdy ones continued to reproduce.

For our commercial animals, high production has called for high-level inputs ... and so we've also had to turn a blind eye to the long-term effects of pushing the beasts to their physical limits. The urge to produce meat animals in record time means higher grain and hay inputs. While I'm NOT of the school that believes we're running out of human food by feeding grain to meat animals, I still keep wondering what the rush is over. It's one thing if you can buy corn at 3-cents a pound, and alfalfa at \$1 a bale (which you can't) -- but what kind of selection pressure are we putting on animals that are fed heavily on grain? Are we selecting for animals that cannot produce without high inputs?

Livestock producers, commercial and otherwise, are also guilty of liking their animals too much. We love these rare breeds so desperately that we want to keep every single one of them alive and reproducing. It's the worst thing we could possibly do. Culling — in the same way natural selection does — means removing from your flock or herd any animals that carried a heritable condition. This means, effectively, that any time you must intervene to save an animal's life, it is a candidate for culling.

Again, I'm not saying that we shouldn't medicate during sickness, or assist when our livestock needs help. We just shouldn't breed an animal that required medication or assistance in order to recover. Allowing that animal to reproduce allows a weakness to creep into the line. In a small herd

of rare breeds, two or three breeding females with a tendency to difficult birth or uterine prolapse or feet problems may, in a half dozen years, equal 15 to 20 with that weakness. Worse yet, if the herd sire shows a heritable condition, then in three years 70 to 90% of your bloodline may carry that trait.

The biggest mistake of all is to focus solely on the animal's appearance as a criterion for judging breeding stock. In sheep production — as in dogs — there are distinct "show" and "working" lines. Show animals are made to look good. Working animals are made to do their job efficiently. While we all value a heavily curled Bashkir Curly Horse with its Shirley Temple ringlet coat, for instance, it's their stamina, intelligence, and friendliness that makes the breed. If you want these latter traits to continue in Curlies, you must select them. If you want to judge the horse on its looks alone, then sooner or later you'll end up with a bunch of great looking disease-prone airheads — the same thing that has happened to dogs bred for bench shows.

What it all comes down to is having a clear vision of the value of commercial and heirloom animals' unseen qualities, and the willingness to do whatever it takes to keep those foremost in your herd. If we want Karl Zinsmeister's "healthier, more efficient" animals, then we should keep vaccinating, spraying and medicating. If we want to give our descendants hardy, innately healthy animals clothed in quality fleeces and distinctive coats, then we've got to find another way.

## GARY NABHAN ON SEED CONSERVATION AT CORNELL

Laura Krouse, Mt. Vernon

In mid-February, Cornell College, in Mt. Vernon, sponsored a conference titled "Our Vanishing Seed and Agricultural Heritage." The conference source people were Kent Whealy of the

Seed Savers Exchange (SSE), and Gary Nabhan of the Desert Botanical Garden of Phoenix, AZ. Most PFI members are aware of the efforts of Kent Whealy and the Seed Savers Exchange to protect the genetic diversity and traditions of heritage garden plants. Fewer PFI members probably know of Gary Nabhan.

Gary is an ethnobotanist. He studies the relationships of people and plants. His particular interest is the traditional plants of the indigenous people of S.W. United States and northern Mexico. He helped to found an organization called Native Seeds Search, which has many of the same goals as SSE.

Gary has written several articles and three books which may be of interest to PFI members: *The Desert Smells Like Rain: A Naturalist in Papaqo Indian Country*, *Gathering the Desert*, and *Enduring Seeds: Native American Agriculture and Wild Plant Conservation*. Both Gary and Kent received MacArthur Fellowships in 1990, and so are able to spend time researching, writing, speaking, and saving seeds without worrying about their incomes — at least until 1995!

Gary's talk to the group of students, faculty, and visitors was inspiring. He spoke of the interdependent relationships of food and people, especially in the indigenous cultures of the southwest and Mexico. There, plants are seen as more than food, but rather as an important part of the cultural heritage. Hundreds of plants are involved in every aspect of day-to-day life, including the economy, religion, language, and customs. As indigenous cultures and unique arid habitats disappear, we lose not only the plants, but also the cultural traditions that go with those plants. As plants are lost, we lose both the genetic diversity they contain and any opportunity to use them in

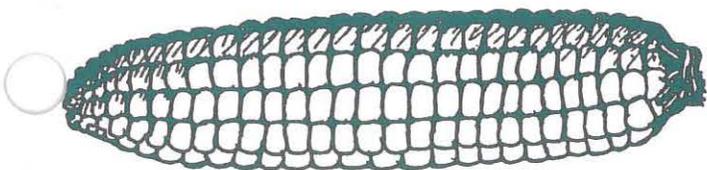
the future to alleviate hunger in hot, arid regions. We forget the old methods for producing high quality foods efficiently with few inputs. We lose the experience of those who know the traditional medicinal uses of plants. And we alter the balance of life on the planet, usually in ways we don't understand. Gary urged his audience to be concerned about traditional plants, wild habitats, and indigenous people, not only for the economic benefits we may eventually gain from them, but because they are an important component of our culture.

## FIRST RESISTANCE TO BT DOCUMENTED

(Editors' note: This article is reprinted by permission from vol. 4, #2 of *International Ag-Sieve*, a sustainable agriculture newsletter published by the Rodale Institute, of Kutztown, PA. "Bt" is a bacterial product that has insecticidal properties. Why is Bt resistance in moths important to Iowa agriculture? Seed companies are considering the sale of corn with the gene for Bt. That would initially be effective against corn borer -- unless the borer became resistant to Bt. A few years ago, industry representatives were insisting this couldn't happen. As this article describes, the issue of resistance is just as real for Bt as it is for synthetic pesticides.)

Diamondback moth in field populations developed resistance to *Bacillus thuringiensis kurstaki* (Bt) after repeated commercial foliar applications, according to researchers at the University of Hawaii. Exposed strains of the moth, *Lepidoptera plutellidae*, were found to have 20 to 40 times the resistance of unexposed strains. Bt has been used as a biological insecticide for 20 years with no previous resistance reported in the field. Today, Bt is widely used as one of the most promising alternatives to chemical insecticides.

Researchers conducted a long-term study of insecticide resistance in the diamondback moth, *Plutella xylostella*, to determine if populations in Hawaii vary significantly in their susceptibility to Bt. The survey began in 1986 and tested six moth populations that had previously received varying treatments of Bt. The most heavily treated (SO)



**Table 1. Mortality of *P. xylostella* larvae at a concentration of Bt equivalent to the field rate (25.6 mg[A.I.]/liter).**

Population	Date	Replicate	Dead/total	Mortality
<b>Untreated laboratory colonies</b>				
LAB-P	'86-'8	4	39/41	95%
LAB-P	1989	16	150/160	94%
LAB-L	'86-'8	4	40/40	100%
<b>Heavily treated field populations</b>				
SO	'86-'8	8	51/82	60%
SO	1989	16	56/159	35%
<b>Minimally treated field populations</b>				
WO	'86-'8	4	31/39	77%
WO	1989	16	124/158	78%
PO	'86-'8	4	32/39	82%
KH	'86-'8	4	25/33	74%
LH	'86-'8	4	24/40	60%
KM	'86-'8	4	36/40	90%
* Corrected for mortality in water-treated controls (Abbot 1925).				

population had been exposed to Bt 50 to 100 times, starting in 1978 and ending in 1982. The other five populations (WO,PO,KH,LH,KM) received fewer than 10 treatments before the first study sample was taken. Also tested in the study were two laboratory colonies (LAB-P, LAB-L) that had been kept free of insecticide exposure. All populations were tested again two years later to determine if Bt resistance had increased. Moths from each population were exposed to Dipel (a commercial Bt product, 25.6 mg/l) to monitor their relative susceptibility.

Tests in 1986-87 showed that the frequently treated, or SO, population was significantly more resistant to Bt than either of the two laboratory strains (Table 1). Application of Dipel killed 90 to 100 percent of the susceptible LAB-P and LAB-L colonies, 60 to 90 percent of the minimally treated

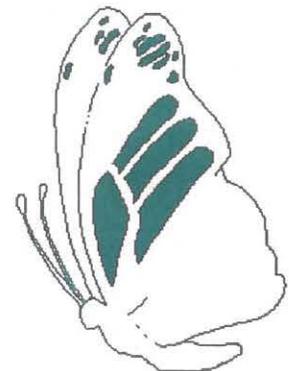
field populations, and 60 percent of the heavily treated SO population. In 1989, only 35 percent of the SO larvae were killed. The untreated and minimally treated field populations exhibited no significant increase in resistance by 1989. Results show that the levels of resistance attained by the SO field populations may be high enough to substantially reduce field effectiveness.

The resistance problem comes at a time when Bt's popularity and usage are increasing. For example, recent advances in genetic engineering have included the insertion and expression of Bt toxin genes into major crops like cotton, tobacco, potato, and tomato. The development of new Bt strains and altered host ranges may further increase its usefulness.

The key to managing Bt resistance is prevention through judicious application. Unless the principles of IPM and pesticide resistance management are used — methods such as tissue specific and conditional expression of toxin genes in genetically engineered crop cultivars, and incorporating untreated plant matter — the reliability of Bt may be undermined.

Tabashnik, B.E., N.L. Cushing, N. Finson, M.W. Johnson, 1990. Field development of resistance to *Bacillus thuringiensis* in diamondback moth (Lepidoptera: Plutellidae). *Journal of Economic Entomology*. 83: 1671-1676.

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# PHOSPHORUS AND POTASSIUM FERTILITY — HOW MUCH IS ENOUGH?

Rick Exner

In 1989 and 1990, nine PFI members' farms were the sites for phosphorus and potassium research conducted by Drs. Antonio Mallarino and Fred Blackmer, of the Iowa State University Department of Agronomy. These researchers came to PFI partly because they were seeking corn fields

that might show a response to P and K. That kind of site is getting harder to find. Twenty years ago, only 25% of soil samples tested high or very high for phosphorus or potassium, but those numbers have climbed to 65% and more than 60%, respectively (Killorn et al., 1990).

Mallarino worked with seventeen farmers in all, laying out a total of 25 experiments for phosphorus and 29 for potassium. Different fertilizer rates

Soil test P (Figure 1) and K (Figure 2) values during 14 years as affected by initial and annual applications of P and of K fertilizer, respectively, at Kanawha (means of six replications).

Fig. 1

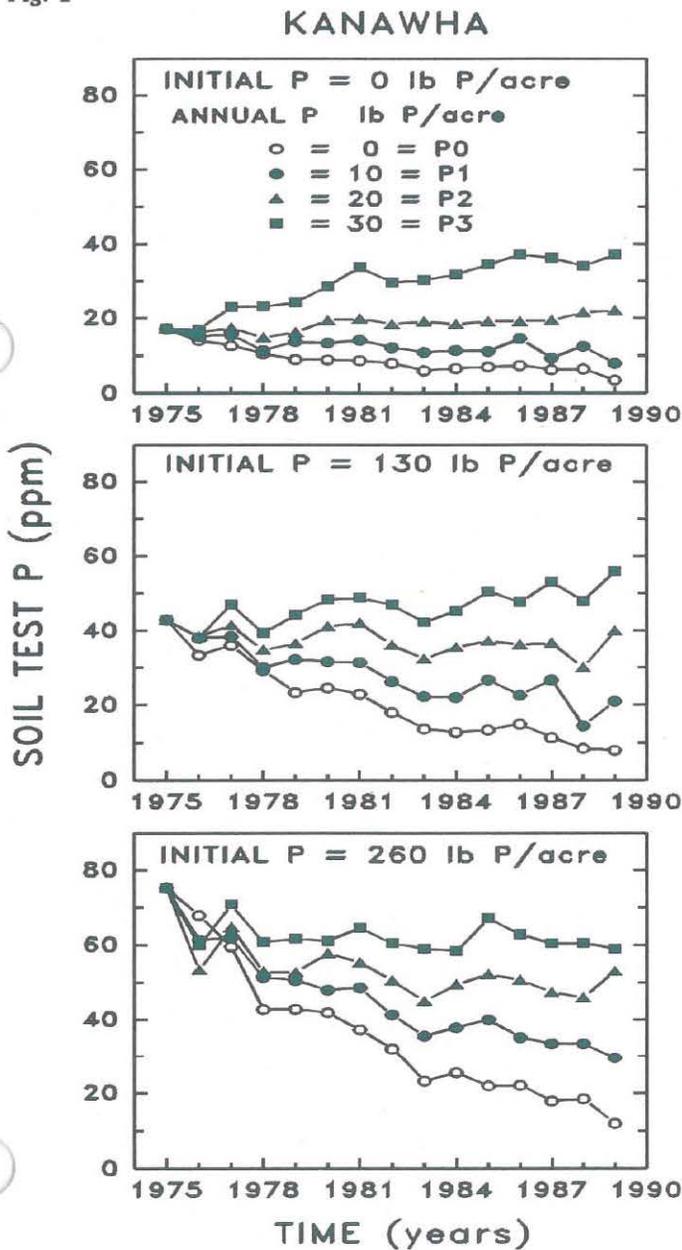
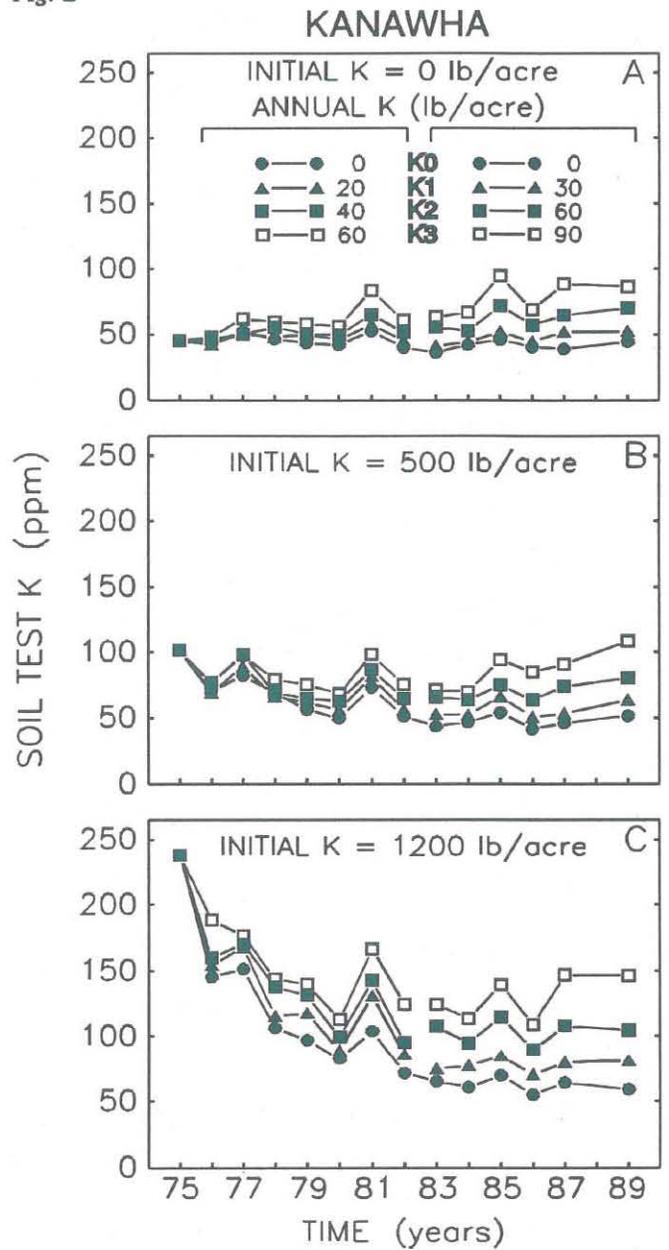


Fig. 2



were applied to field plots. In P experiments, rates were 0, 50, 100, and 150 lb of P<sub>2</sub>O<sub>5</sub> per acre. In the K experiments, rates were 0, 60, 120, and 180 lb of K<sub>2</sub>O per acre. In conventionally tilled fields, the fertilizer was broadcast before tillage in the spring. In ridge-till fields, the fertilizer was spring broadcast and incorporated by the planter sweeps.

Even on PFI members' farms, the majority of sites tested high or very high for phosphorus and

potassium. For all experiments over the two years, only one response to potassium fertilizer was observed and six responses to phosphorus fertilizer. These results are typical for the state of Iowa today.

Mallarino and Blackmer have also worked with retired professor John Webb to present data from long-term fertility studies conducted by Webb at several experiment stations around Iowa. In two of

Relationship between soil test P (Figure 3) or soil test K (Figure 4) and economic returns from annual applications of P or K, respectively. Prices used were annual averages for the USA (Agricultural Statistics Board, 1976-1989).

Fig. 3

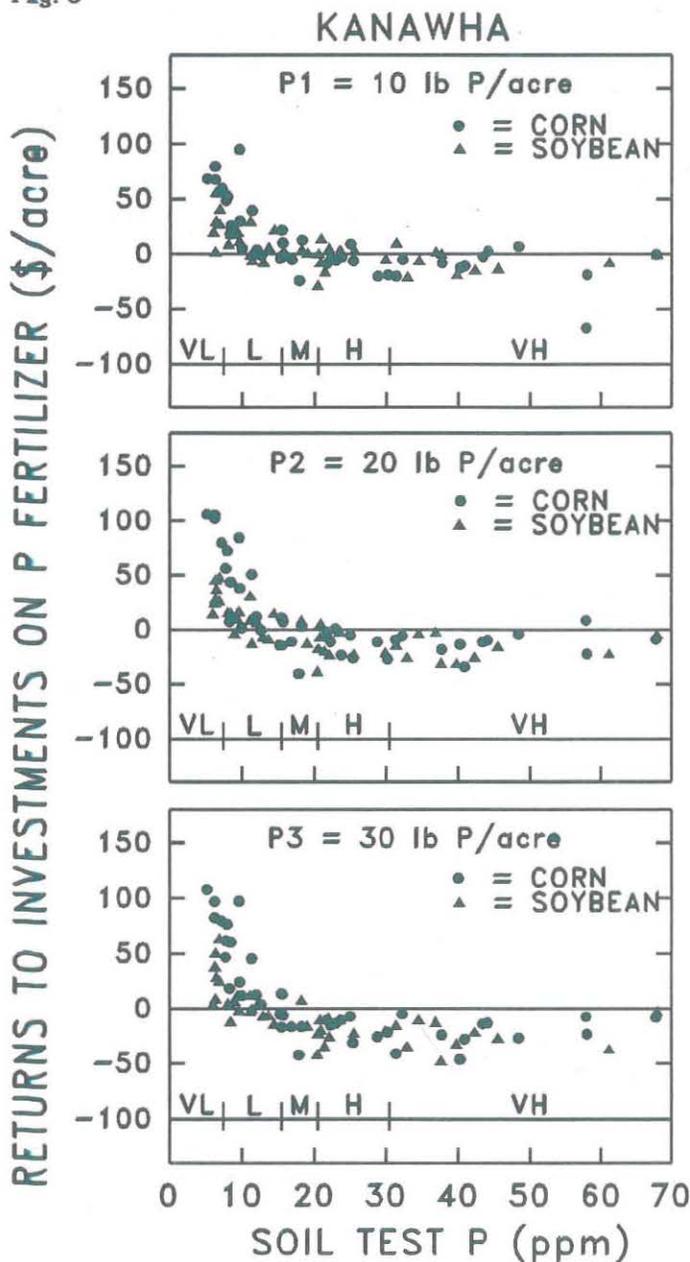
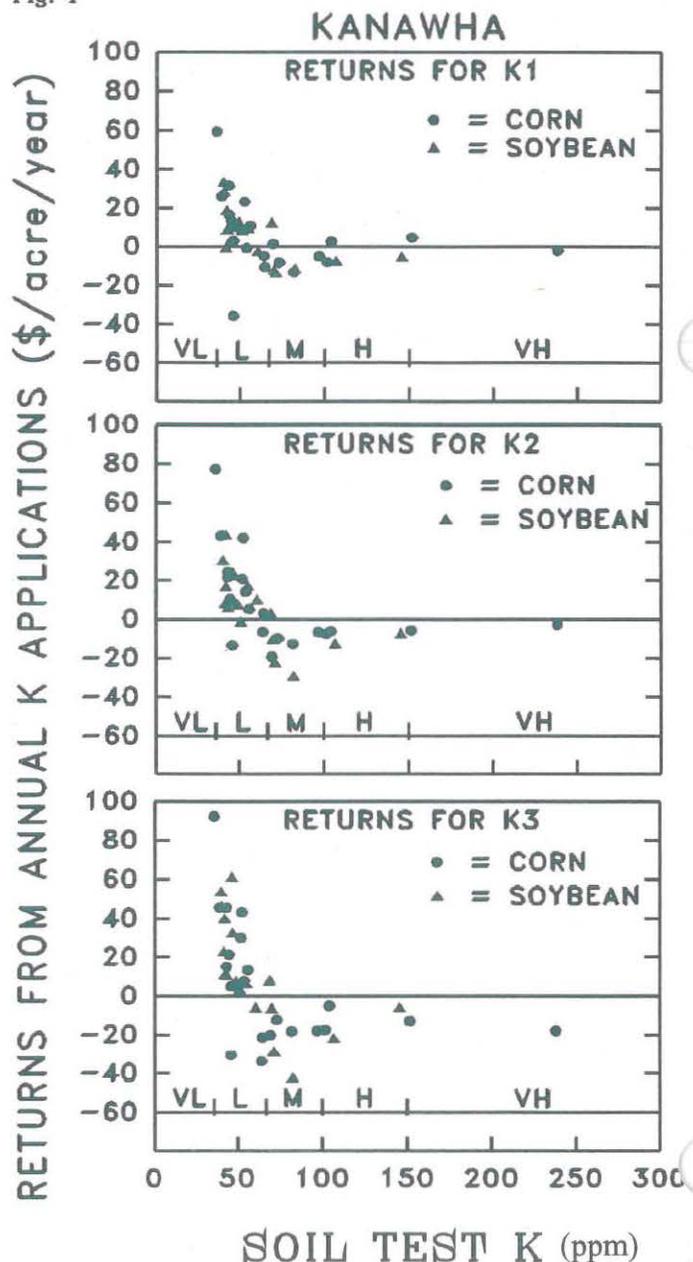


Fig. 4



these trials, plots were initially fertilized to either a high or an extremely high soil test level, or they were left unfertilized at a low soil test level for P and K (Mallarino et al., 1991; Webb et al., 1992). Then each of these main plots was divided into subplots that for the next 14 years of a corn-soybean rotation received different levels of maintenance fertilizer (P0, P1, P2, P3, or K0, K1, K2, K3). Figure 1 and Figure 2 on page 19 show the effect of the treatments on soil test P and K for the site at Kanawha. Soil test P and K are represented in elemental form rather than as  $P_2O_5$  and  $K_2O$ . The annual application rates of potassium fertilizer were adjusted upward midway through the experiment.

The data show that only modest applications of P and K were needed to maintain low or moderate soil test levels. However, the higher the soil test target level, the higher the annual rate required to maintain it. This contradicts the philosophy that very high soil test levels are "like money in the bank." Not only were the opportunity costs of these fertilizer expenditures forfeited (no return on fertilizer dollars), the "bank account" was also drawing negative interest as the fertilizer disappeared! In these experiments, even after taking into account the extraction of nutrients in grain, each year less and less of the excess soil P and K was available to the crop, as the phosphorus was converted into unavailable forms and the potassium became tied up in the clay structure.

Figures 3 and 4, opposite, show the economic return to investment in P and K fertilizer for the Kanawha experiment. A \$2.50/acre application cost of fertilizer was used, as were actual prices for fertilizer and grain. Phosphorus fertilizer averaged 22 cents per pound of  $P_2O_5$ , and potassium fertilizer averaged ten cents per pound of  $K_2O$ . Corn averaged \$2.37 for the period, and the average price for soybeans was \$6.27.

For both corn and soybeans, fertilization frequently yielded a positive return when soil test P or K levels were below the medium range; fertilizer

was seldom profitable when the soil test was above the medium range. Varying the grain price 50 percent higher or lower had little effect on the economically optimum soil test level (data not shown).

In the 1980s, several reports were released comparing soil test recommendations from university soil test labs to those of private laboratories. These studies showed university recommendations generally saved farmers money on fertilizer with no loss of crop yield. Today a soil test report may state that no yield response to fertilizer can be expected if soils test high or very high in phosphorus or in potassium. Perhaps they should say something like "You'll be pouring your money down a rat hole if you apply fertilizer on soils testing in the high and very high ranges."

Some people see high soil tests as an insurance policy, covering for infrequent or unrepresentative soil sampling, weather variations, and conflicting information about how much fertility is really enough. Crop management and other scouting services typically recommend this option in order to be "on the safe side" with their clients. But just like an insurance policy, this kind of fertility policy has a cost attached. It's a cost that a you as a producer can avoid, though, by soil sampling regularly and correctly, and by making sure the buck stops on your own desk.

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## PEAT AND FERTILIZER COMBINED TO PREVENT GROUNDWATER CONTAMINATION

(Editors' note: This article appeared in the July/August, 1991 issue of *Conservation Impact*, the newsletter of the Conservation Technology Information Center, West Lafayette, Indiana.)

Producers farming in wetter areas may soon have a new technique for nourishing crops while protecting the environment. Canadian researchers have developed a process for fertilizing the soil that combines peat moss and conventional fertilizers in pellet form. The technique also allows more rational use of fertilizers and makes more nitrogen available to crops.

"Studies show that peat mixed with fertilizer prevents water from leaching out nutrients contained in the fertilizer," explains John Richards from Agriculture Canada's research station in Fredericton. "Our laboratory experiments indicate that when one centimeter of water is passed through soils treated with conventional fertilizers, 50 percent of the nitrate contained in the fertilizers are leached out. When peat-fertilizer pellets are used, nitrate losses are cut to seven percent."

Scientists at the Peat Research and Development Centre in Shippagan, N.B., are working with Agriculture Canada to develop this new fertilization technique.

Peat mixed with fertilizer acts as a buffer, releasing nutrients in small amounts which allow plants to absorb more of the nitrogen contained in the pellets.

The pellets are made by mixing peat with conventional fertilizer and putting the mixture through a process called extrusion. The size of pellets is variable, but those used in New Brunswick are cylindrical in shape and measure seven millimeters in diameter by ten millimeters (about one-third inch).

## FROM THE KITCHEN

Marj Stonecypher, Floyd

(Editors' note: We got lucky! Marj Stonecypher, who farms near Floyd with husband Ray, has agreed to share a few recipes in the newsletter. She says she has an easy bread recipe as well. Marj also writes a column for a farm magazine published in Wisconsin.)

Here is the recipe that we were talking about at the district potluck, that the ladies wanted me to put into the newsletter.

### HUNGRY MAN'S PAN PIZZA

1 lb ground beef, pork or chicken  
 1/4 teaspoon salt  
 1/4 to 1/2 tsp. oregano  
 1/4 chopped red & green peppers  
 1/2 tsp. garlic  
 1/8 tsp. pepper  
 1 small chopped onion  
 1 - 4-oz. can of mushrooms  
 Brown the above until done. Drain.

Add:

1 - 15-oz. can tomato sauce or pizza sauce  
 1 T. pizza seasoning (optional)  
 Set aside.

Combine to make batter:

1 cup flour  
 2/3 cup milk  
 1 tsp. salt  
 2 eggs

Mix and pour into greased 15 1/2" x 10 1/2" x 1" cookie pan. Pour meat and tomato mixture on top.

10 minutes to prepare. Bake for 20 minutes at 425 degrees. Top with cheese and bake 5 minutes longer. Let set a few minutes before cutting. 35 minutes, ready to set on the table.

Lettuce salad on the side. You may use any kind of topping, like sliced tomato, olives, etc. May use taco seasoning in meat, too.

## SUNNY LEMON CHEESECAKE SQUARES

(fast and easy to make)

1 pkg. lemon cake mix

2 eggs

2/3 cup coconut

1/2 cup margarine or butter, softened

8-oz. pkg. cream cheese, softened

11-oz. can mandarin orange segments, well drained

Heat oven to 325 degrees. Lightly grease 13" x 9" cake pan. Reserve 1 cup of the dry cake mix. In a large bowl, combine remaining cake mix and margarine at low speed until crumbly. Reserve 1 cup of crumb mixture in bottom of greased cake pan.

In the same bowl, combine reserved 1 cup cake mix, cream cheese, orange segments and eggs at medium speed until well blended. Stir in coconut. Spread over base. Sprinkle with reserved 1 cup crumb mixture.

Bake for 30 to 40 minutes or until center is set. Cool completely, refrigerate until serving time. (It's good warm with ice cream on.) Store in refrigerator.

## MEETING TO DISCUSS PESTICIDE COMPONENTS

Dr. Vernon Varner, an Iowa City physician with a law degree from the University of Iowa, has spent ten years investigating the contents of commonly used pesticides. You may have seen him on the IPBN program *Living in Iowa* this spring. Dr. Varner's attention has focused particularly on the ingredients termed "inert," which are included in these products to enhance their effectiveness, handling ability, and shelf life. Inerts are not subject to the same health and environmental standards as are "active ingredients," and in most cases their identities are closely guarded trade secrets.

At 7:30 pm, on Wednesday, May 13, Dr. Varner will present a talk entitled *What Really is in Pesticides: Do you Really Want to Know*. The meeting will take place at the Durant Community Center, hosted by the Durant Lions Club. The talk is free to the public. For additional information, contact PFI cooperators Mark and Rita Mays, at (319) 732-2040.

### PFI Membership Application and Renewal Form

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

County \_\_\_\_\_

State \_\_\_\_\_

Zip Code \_\_\_\_\_

Phone # ( \_\_\_\_\_ ) \_\_\_\_\_

This is a \_\_\_\_\_ new membership  
\_\_\_\_\_ renewal

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

Yes \_\_\_\_\_ No \_\_\_\_\_

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

**Practical Farmers of Iowa**

**2035 190th St.**

**Boone, IA 50036**

## CORRESPONDENCE

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

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

Associate board member for District 1: Paul Mugge, RR 2, Box 48, Sutherland, 51058. (712) 446-2414.

**District 2 (North Central):** Allyn Hagensick, RR 4, Box 57, Hampton, 50441. (515) 456-2945.

Associate board member for District 2 and PFI Treasurer: Dick Thompson, 2035 190<sup>th</sup> St., Boone, 50036. (515) 432-1560.

**District 3 (Northeast):** Tom Frantzen, PFI President, RR 2, New Hampton, 50659. (515) 364-6426.

**District 4 (Southwest):** Vic Madsen, PFI Vice President, RR 3, Audubon, 50025. (712) 563-3044.

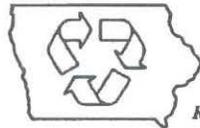
**District 5 (Southeast):** Jeff Olson, RR 2, Box 147, Winfield, 52659. (319) 257-6967.

Coordinators: Rick Exner, Gary Huber, Room 2104, Agronomy Hall, ISU, Ames, Iowa, 50011. (515) 294-1923.

Public Relations Coordinator: Maria Vakulskas Rosmann, RR 1, Box 177, Harlan, 51537. (712) 627-4653.

PRACTICAL FARMERS OF IOWA  
MEMBERSHIP DISTRICTS**Acknowledgment:**

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