

LEOPOLD

Letter

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Outwitting wireworms in corn after grass

by Mary Adams
Leopold Center Editor

In the parade of crop pests facing off with Iowa corn producers, wireworms do not pose as much danger as the European corn borer or the cutworm. However, as Iowans prepare to move land from the Conservation Reserve Program (CRP) back into crop production, wireworms have a unique opportunity to multiply and cause considerable problems for Iowa farmers. Many CRP acres were planted in grasses, which provide an excellent breeding ground for wireworms. While grasses offer substantial fodder, corn fields may also take a beating from ravenous wireworms.

Two years ago, Iowa State University entomologist Larry Pedigo and his fellow investigators anticipated the possibility of a wireworm population explosion. The usual practice for curbing wireworm infestations is to

apply a preventive insecticide at planting. But Pedigo's group was looking for a non-pesticide alternative to combat the wireworm.

In a three-year study, with Leopold Center funding and cooperation from 74 farmers in five Iowa counties, the group is formulating a comprehensive Integrated Pest Management recommendation to help farmers diagnose potential problems and make informed decisions about wireworm management. Much of the work on the project is being done by graduate students Carol Simmons and Steve Lefko.

The group's goals are to use Geographical Information Systems (GIS) in developing a method to rate CRP areas for their risk of crop injury from wireworms; discover simple, effective techniques for farmers and consultants to diagnose the need for management tactics; and assess practical cropping



More than one way to bait a wireworm: In this study, corn and wheat are soaked in water to start the germination process, then placed in soil and covered for several days. The escaping carbon dioxide attracts the wireworms.

alternatives that carry a low risk of wireworm problems.

What are wireworms?

Wireworms are the larvae of adult click beetles. They are most dangerous to corn when seed is planted into infested soil. Seed loss to wireworms is often great enough to cause significant stand reduction and can even necessitate replanting. In the past, wireworm infestations have occurred when pasture land reverted to crop production. Although wireworms feed on many crops, corn is the crop most likely to be affected in Iowa. The problem most commonly occurs when corn is planted following grass sod. Wireworms can withstand extreme conditions of heat and cold, and wet and dry (which makes them good candidates to survive in Iowa).

WIREWORMS

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Anniversary conference draws 300 to discuss, celebrate sustainable agriculture

The Leopold Center's tenth anniversary conference offered everything from field tours to a poetry reading (Iowa farmer and poet Michael Carey, pictured at right). For more images of the event, see pp. 6-7.



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Center, PFI expand partnership

The Leopold Center and Practical Farmers of Iowa have long shared common goals. The Center has funded research and demonstration involving PFI farmers, often in cooperation with ISU and Extension staff. It has also collaborated with PFI on the community-based Shared Visions project. Key to the success of such projects is PFI's on-farm research.



The organizations' leaders and their boards are discussing plans for a longer-term partnership that would allow the two groups to share resources, convey results to the farming public through field days and farmer meetings, and open the resources of PFI and the Center to greater participation by university researchers and educators. For example, Center director Dennis Keeney cites management-intensive grazing programs, which must be conducted on-farm, and education programs such as pasture walks, which need cooperation among farmers, educators, and specialists.

"This relationship will enhance the Center's on-farm research opportunities and provide PFI with a logistical and financial base for planning. We will gain ideas and experiences we could not get elsewhere," Keeney says.

PFI President Dave Lubben adds, "We are pleased to form this partnership. We share an interest in sustainability, environmental stewardship, and community development. Because PFI works at the grassroots level to develop and disseminate environmentally sound, community-friendly farming practices through on-farm research, field days, and community-based projects, many of our projects have benefited from cooperation with the Center and ISU Extension. We hope to enhance this effort."

DeWitt resigns advisory board

Iowa State University agronomy professor Jerry DeWitt, one of the Center's original advisory board members, resigned effective August 1, 1997.

"Ten years was a great opportunity, but it's time to make room for other ISU people to assist in the Center's work," DeWitt said. "Being on the board was a learning experience for me. But it's healthy for the board to get new ideas and attitudes. As much as I'm going to miss it, I'm glad to see others take part." DeWitt will continue to provide leadership for ISU Extension's sustainable agriculture efforts in Iowa.

According to Center director Dennis Keeney, "Jerry has arguably done more to advance the cause of sustainable agriculture in Iowa and the Midwest than any other single person. His knowledge and guidance will be greatly missed."

DeWitt is serving as interim di-

rector for the USDA's Sustainable Agriculture Research and Education Program through 1997. This responsibility entails directing an \$11 million program spanning four regions, and necessitates travel to various states and Washington, D.C.

ISU President Martin Jischke has appointed ISU College of Agriculture executive associate dean Colin Scanes to replace DeWitt on the board.

Scanes says, "I am honored and delighted to join the Center's Advisory Board. The center makes so much difference to Iowa agriculture and to agriculture throughout the United States. Moreover, the center has such a positive effect on the environment and on communities. I view this responsibility as critical to the university."

Keeney adds, "We look forward to working more closely with Colin and regard this as an opportunity to develop our partnership with ISU."



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The Leopold Letter is also available via World Wide Web:
 URL: <http://www.ag.iastate.edu/centers/leopold/Leopold.html>

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The Leopold Center for Sustainable Agriculture seeks to identify and reduce adverse socioeconomic and environmental impacts of farming practices, develop profitable farming systems that conserve natural resources, and create educational programs with the ISU Extension Service. It was founded by the 1987 Iowa Groundwater Protection Act.

The Leopold Letter is available free from the Leopold Center at Iowa State University, Ames, 209 Curtiss Hall, Iowa 50011-1050; (515) 294-3711.

Editor: Elizabeth Weber



Water quality in Iowa: has it improved?

As we celebrate ten years since the passage of the Iowa Groundwater Protection Act, it is logical to ask if that legislation has made a difference in the quality of Iowa's surface and groundwater. As noted Iowa water expert George Hallberg remarked recently, there is a little good news and a little bad news, but mostly no news.

Why can we not give a more glowing report? There are many answers; some seem a bit self-serving and some are buried in the mysterious path of water and associated materials as they move through our environment. Other answers are tied to the high costs that a long-term commitment to monitor our surface and groundwater would entail.

The hardest part of answering the question is tied to the lack of monitoring data. Many monitoring programs currently in place, whether funded by federal, state, or municipal sources, require evaluation of certain surface waters, drinking water, and groundwater. But this basket of data never gets assembled in a useful form, largely because of the cost and effort of doing so—and because no one agency seems to feel responsible for doing so. Reasons and excuses aside, the bad news is that there simply are not any definitive data sources to show water quality trends across the state.

Iowa was off to a great start in the late 1980s with a program that funded organized monitoring of groundwater quality in Iowa's private rural wells. But because it received little follow-up funding, no firm evidence of trends is evident. Whether this is due to a lack of interest or lack of political desire to continue the funding is hard to say.

The complexity of the movement of water and of compounds in the water also makes evaluation difficult. Water moves slowly through the soil and into the aquifers we use for drinking. For example, Ames drinking water derives from an interchange of creek water with that from aquifers that may have been recharged shortly after the glaciers left Iowa 12,000 years ago. Water used in the Des Moines system, on the other hand, comes almost directly from the Raccoon River and is affected by what happens in that watershed each season. Southern Iowa uses surface waters, too, particularly from Lake Rathbun; this water also varies in quality seasonally. Thus it is hard to spot trends that are independent of yearly weather patterns. Moisture has been variable, ranging from dry years in the 1980s to wet years in the 1990s.

The good news: soil erosion and associated runoff of pollutants from highly erodible lands have decreased because of wide use of the Conservation Reserve Program. The CRP is targeting water quality protection more than ever, so we should see improved water quality in areas where erosion has been a concern. We also are using more reduced and zero tillage to plant crops, which helps curb erosion. But many of Iowa's streams are still not well protected from bank and stream-bed erosion, which is a major source of sediment in our ponds and impoundments.

Other good news: fertilizer use, especially nitrogen, declined nearly 20 percent over the past decade as we developed tests to better evaluate the need for nitrogen fertilizer and began basing applications on actual requirements. Still, the monitoring data we do have indicate little change in the amount of nitrate in the groundwaters and rivers, partly because of the complexity of water movement and partly

because our waters contain nitrogen from many sources: legumes, decomposing organic matter, animal manure, and rainfall.

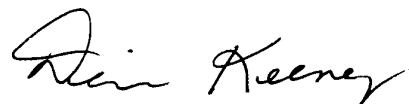
More good news: the use of water-soluble, easily leached herbicides has decreased. The agricultural industry has improved handling of pesticides to the point that spills and groundwater contamination are much less of an issue.

The really good news: the Groundwater Protection Act and other legislation have helped raise the awareness of Iowa citizens about the need to protect and improve the quality of their local water resources. For example, the Year of Water initiative has over 70 citizen and government sponsors. And Iowa does not have the severe water quality problems that have plagued other Midwestern states. This is partly because our extensive land base is in agriculture, whereas many other areas have more potential pollution sources from industry.

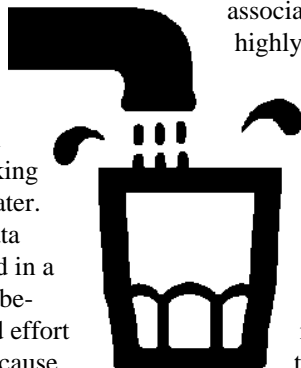
The "no news"? While we believe that all these efforts are making a real difference, there is little proof.

But we must not relax our vigilance. Major threats we must work to control include spills from industrial sites and large animal feeding operations. And we are working to defuse the potential time bombs posed by agricultural drainage wells.

As the next ten years bring more changes in agricultural technologies, markets, and likely in land use, the work of the Leopold Center will increase. There is still room to significantly improve our environmental and economic performance. Doing so will become even more important in the transition to a less subsidized, more open, more competitive agriculture in the United States.



Dennis R. Keeney



Iowans' views on water revisited a decade later



Ten years after passage of the Iowa Groundwater Protection Act, Iowans remain concerned about water quality, according to a survey released by the Iowa Environmental Council and funded in part by the Leopold Center. More than 80% of those surveyed think more research is needed on ways to protect water resources.

The survey found that attitudes toward issues such as education and economic development had shifted during the past decade, while water quality concerns remained high.

"This is a strong message from Iowans," says Dennis Keeney, Center director. "Despite the changing priority of other key Iowa issues, our citizens continue to be intensely protective of our water resources. Clearly, the issues the Center is addressing are of concern. Pollution source reduction and resource protection fit perfectly with the goals of sustainable agriculture."

The study updates a 1986 survey conducted by the Iowa Department of Natural Resources in preparation for

drafting the law that created the Leopold Center and a variety of other statewide research, education, and demonstration efforts to protect water resources. The 1996 survey was conducted by Iowa State University sociologists Paul Lasley and Steve Padgitt in cooperation with the Iowa Agricultural Statistics Service. Telephone interviews were conducted in November 1996 with 403 randomly selected Iowans. Findings are considered accurate within +/- 5%.

A decisive 84% of those surveyed said surface water pollution is a serious problem; 77% call groundwater pollution a serious concern. The sentiments are comparable to the 1986 survey, which found 86% of Iowans seriously concerned about groundwater quality.

More than half (58%) of those concerned about their drinking water believe farm chemicals pose a "very high" risk to their drinking water, though that percentage fell significantly from the 1986 survey. Other sources that respondents consider a "very high" risk include industrial waste (55%) and livestock waste (33%).

Abandoned dumps and hazardous waste sites topped the list as the source of "a great deal" of surface and groundwater pollution (cited by 49%). Forty-four percent of those surveyed

believed agricultural use of pesticides contributed a great deal to water pollution, a decrease from the 1986 survey.

Asked about ways to reduce pollution from pesticides and fertilizers, respondents were most positive about further research on safe use of these substances—an approach that garnered support from more than 90% of respondents in both 1986 and 1996. Both surveys found that more than 75% support tighter restrictions on pesticide and fertilizer use in cities, in towns, and on farms.

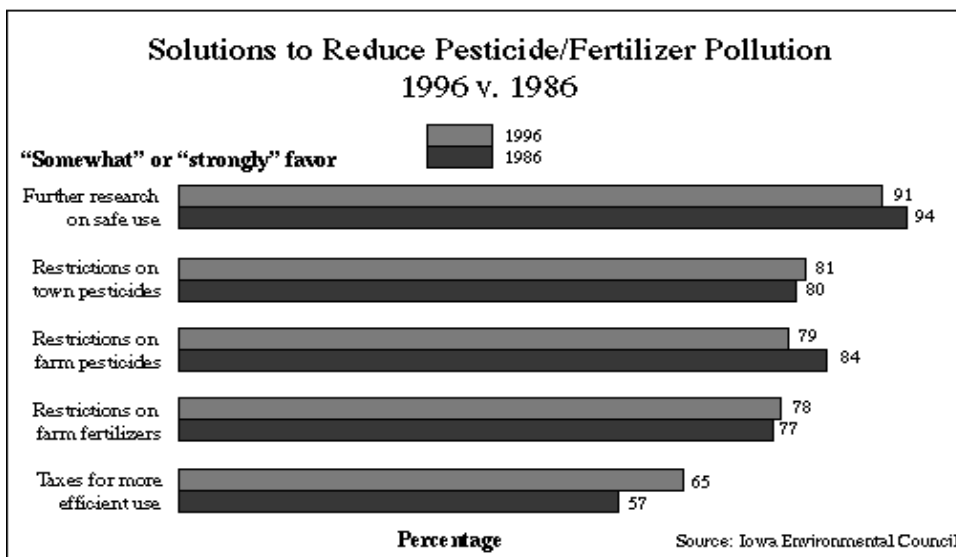
Increased support for higher taxes to encourage more efficient use of pesticides and fertilizers (up 8% from 57% to 65% between 1986 and 1996) suggested a significant shift in policy attitudes.

Adequate public communication about Iowa water remains a challenge. While one-half of those surveyed believed they had the information they needed to make decisions about water quality issues, 35% did not. Padgitt and Lasley conclude that "... the need for persons and organizations with scientific information about water quality to work closely and proactively with the media is critical."

Keeney adds, "We need to redouble our efforts to provide Iowans with an array of ways to lower their use of agrichemicals, protect lakes and streams, and apply livestock manures safely while allowing Iowa agriculture to remain competitive."

Further information about the survey can be found on the Iowa Environmental Council's World Wide Web page: <<http://www.earthweshare.org>> or by calling the council at (515) 237-5321.

Survey participants indicated their level of support for policies related to pesticide and fertilizer pollution. Results were very similar to the 1986 survey with a wide margin of respondents saying they either "somewhat favor" or "strongly favor" each policy solution. (Chart courtesy Iowa Environmental Council)



WIREWORMS

(continued from page 1)



Wireworm weapons

Using GIS, Pedigo's group is creating an early warning system for locations at risk from wireworms. Construction of a soil habitat model for wireworms required the researchers to establish a more precise means of estimating soil moisture and temperature and a measured set of criteria for evaluating soil habitat. Preferred soil moisture levels for *Melanotus* wireworms were analyzed in the laboratory; the researchers also conducted field studies in brome grass fields characteristic of CRP ground cover. Because wireworm presence depends on the frequency of days above a certain soil moisture threshold, the model is designed to predict possible wireworm outbreaks on this basis.

In the first step of the warning system, a model based on soil moisture generates an index of the favorable conditions for wireworms. GIS is used to combine the moisture model data with spatial soil characteristics to detect habitats that fall within the reference points for wireworm reproduction and survival. The information can be used to flag high-risk areas and then notify producers to take action. GIS is more cost effective when used on a large area, and potential problem areas identified can then be monitored by taking on-site samples. These sampling procedures will allow producers to confirm or rule out the presence of harmful wireworm populations.

"We will develop a set of user-friendly diagnostics for on-farm use by producers with potential problems and investigate low-risk cropping alternatives to planting insecticide-protected corn," says Pedigo.

Scouting for wireworms

Defining the relationship between the physical properties of Iowa soils and the presence or absence of wireworms was a critical task. The 74 cooperators, located in O'Brien, Monona, Floyd, Story, and Lucas counties, provided 87 sampling sites. Twenty core samples were taken from each field; preliminary data showed that location had no special effect on measured wireworm densities. The counties differed widely in climate and soil variables, representing high potential for wireworm species diversity. Wireworms were found at 40 of the 89 sites, and 15 different species were collected. According to Pedigo, "This suggests that nearly 45 percent of Iowa CRP fields may contain wireworm densities worth scouting further for potential economic impacts."

Prior research has indicated that wireworm habitat evaluation should focus on gauging soil moisture and temperature, although the latter is thought to be less critical to wireworm survival.

Baiting wireworms

Efforts to delineate exactly which wireworm species inhabit selected areas led to 25 weeks of sampling at a field site in Muscatine County in 1995. Trapping precision of soil core sampling, an absolute but more expensive methodology, was compared with five relative sampling methods. For larval wireworms, these included corn/wheat baiting, melon baiting, wire-mesh baiting (an arrangement of seed corn on a buried mesh strip), and pitfall trapping

(using buried, inverted soft drink bottles with the tops cut off). Pheromone trapping was used to estimate adult populations. From 2,100 samples, researchers collected 659 larvae and 42 adults.

To determine which relative sampling method was most user-friendly, each technique was evaluated both for precision in determining populations of wireworms and cost of usage. The pitfall method proved unreliable and was replaced in 1996 with the potato bait method. Wire-mesh bait traps had the greatest level of accuracy for estimating wireworm populations, but cost analysis showed corn/wheat baiting to be most efficient.

In 1996, two sampling sites were added in Hancock County (near Britt and Garner) and 2,480 samples were collected. Larvae were first recovered in April and continued to be detected throughout the growing season. The Muscatine site yielded 315 larvae and 129 adults, while 73 larvae were collected at Britt and 642 at Garner.

An evaluation of the entire sampling season showed that the corn/wheat bait traps continued to perform best, an important consideration in light of Pedigo's recommendation that a field be treated when an average of one wireworm is trapped per week.

Statewide applications

Pedigo sees providing statewide wireworm alerts as the next frontier: "Expanding the application of the wireworm risk model involves purchasing and formatting digital maps of soil characteristics for Iowa, and compil-

ing daily weather data for each Iowa county. After the data are acquired and formatting is completed, the computer model will be run to produce maps of wireworm risk for the farming public."



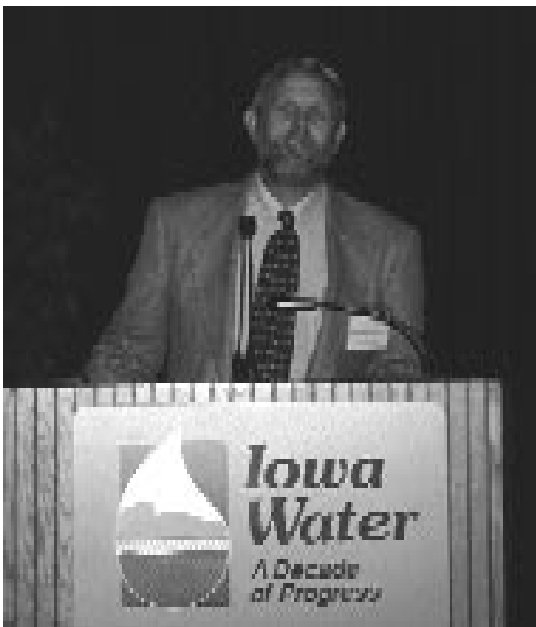
Baiting stations were covered with black plastic (left) to help heat soil; this facilitates germination and makes the bait more attractive. The stunted corn seedling (right) reflects feeding damage by wireworms.

Images of the Leopold anniversary conference

Top row (left): ISU Agriculture College Dean David Topel (left) talks with local farmer Gary Cornelious as Center Associate Director Mike Duffy and former Center advisory board member Sue Mullins look on; (right) conference meals, which featured primarily Iowa-grown food, provided sustainable agriculture advocates with time to exchange ideas informally.

Middle row (left): Participants were welcomed to the Scheman Continuing Education Building at ISU; (center) Des Moines consultant Pat Boddy examined how sustainable agriculture can be communicated to a broad array of audiences; (right) Paul Johnson, one of the Iowa legislators who crafted the founding legislation of the Leopold Center and currently Chief of the Natural Resources Conservation Service, fields questions after his keynote address.

Bottom row (left): Johnson challenged Iowans to better understand resources such as wildlife that exist on private crop land; (center, left to right) Henry A. Wallace biographer John Hyde, Aldo Leopold biographer Curt Meine, and Center advisory board member and farmer David Williams discuss how Wallace and Leopold might perceive modern-day agriculture.



Leopold Center's tenth conference, July 30-31, 1997



LEOPOLD CENTER



Wendy Wintersteen (left), Center advisory board member and interim director of ISU Extension to Agriculture, explained the reasons for her own commitment to sustainable agriculture as she welcomed conference attendees.



Center director Dennis Keeney (above left) thanks Buddy Huffaker, ecologist with the Aldo Leopold Foundation of Baraboo, Wisconsin. In a special program, Huffaker provided glimpses of Leopold's personal life and work as a conservationist.



Shelterbelt research near Ogden (above) and hooped structures for hogs on the Dave Deyoe farm near Nevada (right) were two of seven tour sites that conference participants could visit. Perfect weather both days of the conference made tours a popular choice.



Learning organizations and communities:

The concept of learning organizations and communities has been applied as a model to deal with agricultural and rural social issues. According to various authors, learning organizations and communities view the learning process as an important objective in its own right, rather than as a side trip on a journey to some other goal. Ideally, organizations or groups that deliberately analyze and manage their learning and communication struc-

tures are able to move toward their goals in a more direct and enlightened fashion.

Here is a partial summary of a recent conversation among five individuals who have experience with various learning group models. These excerpts focus on how the learning organization model can be applied to sustainable agriculture.

Participants:

- **Ricardo Salvador** is an Iowa State University (ISU) associate professor of agronomy and a practitioner of learning communities.
- **Ann Schultz** is the program coordinator for Vision 2020, an ISU-based program that is working to improve education about food production systems by the year 2020.
- **Francis Thicke**, an organic dairy farmer from Fairfield, is coordinator of Growing the Future, a community-based sustainable agriculture project supported by the Kellogg-sponsored Shared Visions project based at ISU.
- **Dennis Keeney** and **Rich Pirog** are director and education coordinator, respectively, at the Leopold Center for Sustainable Agriculture.

Rich: To examine the value and role of learning communities and organizations in transforming agricultural groups and organizations, let's start with the definition offered by Peter Senge, director of the Center of Organizational Learning at the Massachusetts Institute of Technology's Sloan School of Management and author of *The Fifth Discipline: The Art and Practice of the Learning Organization* (Doubleday, 1994):

“. . . organizations where people continually expand their capacity to create the results they truly desire, where new and expansive patterns of thinking are nurtured, where collective aspiration is set free, and where people are continually learning how to learn together.”

What are your reactions to this definition?

Ann: This definition applies more to a business setting or an organization with an established membership. When I talk to people around the state, we define an organization or community as a climate to be creative, where knowledge can be exchanged. That means including stakeholders who haven't been included before. Those are points not included in Senge's definition.

Francis: Does this mean that the university is not really a learning community?

Ann: Yes. The university is the older, closed paradigm. Our new definition of a learning community requires us to go outside to bring in more voices to be heard.

Learning communities must also have vision. When people come together, they must be willing to say, “We really don't know how to get there, but we do have a shared vision.” They also have a commitment to change (or transformation). One person does not come in with all the answers and say, “if you other people would just listen, then we can get this over with.”

The university has often been competitive instead of collaborative, but that structure is changing. With businesses outside the university doing a lot of research, universities can no longer afford to pretend that they have all the answers. People realize we don't. We need to hear the right questions so that we do the right research.

Ricardo: A true learning community is also galvanized around a well-defined, agreed-on objective or purpose.

Ann: We are talking about two different terms here: a learning *organization* and a learning *community*. They're not entirely interchangeable. In Senge's book, one example of an organization was the Ford Motor company. They took employees who usually don't work very closely and brought them together collaboratively. To me, that's a learning *organization*.

learning through dialogue

Anne (continued): A learning *community*, on the other hand, is created around a specific problem, but not only within one organization. That is our definition in the university as we go outside it. Instead of coming together for a discipline, we're coming together to solve a problem. We don't think the university has all the answers. We need to bring in people from outside; that makes it a learning community.

Francis: Another key element in learning communities is the way leadership is structured. Top-down, authoritarian leadership is destructive to a learning community. Leadership works best if it emerges from within the group based on members' interests, knowledge, and capabilities.

Ricardo: Ann's observations about communities versus organizations are very useful. The nouns we're using can get us into trouble, because in calling the university a learning community, there is an assumption here that we actually have a community, and we just need to focus on the learning aspect. I don't think we have community as a university. If we do, it's the most meager kind of community, for lots of reasons. A key feature of the true learning community is that it's galvanized and cohesive.

That doesn't necessarily mean the community needs a narrowly defined purpose. But there's no single forum where the university community (talking strictly in the sense of university employees) really can explore their values, share ideas, discuss, or disagree. We find these [attributes] more often in the public debate. Even within university departments, I don't think we can assume we have a community. That gets us into trouble when we try to talk about a "learning" community; that is, we can't define an attribute of an entity that's so fuzzy.

Ann: This is part of why creating the climate for exchange is a big challenge for the university. And the communities can't be only university people; they must include others.

Ricardo: As a land-grant institution, it's part of our mission to include the community in our debates.

Francis: There's a difference between integrating others and including others. The land grants are really quite iso-

lated in that they don't integrate those who they are serving in agriculture into their system; the same is true for the USDA. There aren't enough internships and sabbaticals on the farm to really make that strong link. It seems we're still throwing the graduates out to find out what they're really up against on their own. We need to integrate that transition into the area of agriculture the universities are serving.

Rich: What are some examples of learning communities?

Ricardo: Practical Farmers of Iowa (PFI), the Integrated Farming Systems Initiative that the Kellogg Foundation is sponsoring, and the central Iowa Magic Beanstalk community-supported agriculture group are good examples of learning communities. They're made up of people who believe in inclusiveness. They have relatively flat hierarchies. People realize that certain roles must be played, but that any one of

them might be able to serve in those roles. Those roles aren't played for self-aggrandizement but rather to make sure that the organization is functioning. One essential feature is their open leadership style and a willingness for individuals, particularly leaders, to be transformed by what they learn. Because of the experiences they have and

what they learn working with the group, and because they don't set themselves above other peoples' ideas and desires, they end up being transformed.

Dennis: We're all talking about how these issues relate to our own organizations. At the Leopold Center, part of the problem is that by forcing a relatively small competitive grants program into the same lock step as everyone else, we force applicants to be competitive with their ideas, which then have to go out for peer review. Maybe that's wrong. We should try harder to learn what people out in the community really want from the research. So one thing we tried recently was to hold our advisory board meeting on a farm.

Ricardo: For people who have had little connection with the university, the proposal process is really foreign. They would prefer to pick up the phone, talk about their ideas, and use a format that is not so strapped with the conventions of academia.

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Dennis: We are aware of this; when you look at the efficiency of the competitive grants program relative to the time spent really communicating, I know we're not doing it "right."

Rich: We faced this issue this past year when we called for proposals addressing community regeneration issues. Most of the resulting proposals originated from outside the university. How can the Leopold Center and other organizations find models that point toward indigenous rather than academic knowledge in our programs?

Francis: I think that's very important. Out in the field, there is resentment from farmers who feel that only degree knowledge is viewed as legitimate. Many farmers, especially organic farmers, are critical of the Leopold Center because they still equate it with the conventional university that they think has not served them well. They feel their knowledge and experience as organic farmers have not been utilized or honored. Reaching that group would help in many ways.

Ann: How do we transform the university by using Francis's model? This indigenous knowledge model may have potential for Iowa agriculture. How do we get people at the university to give credence to it?

Francis: It might help to promote more interaction between the university researchers, educators, and students and the farmers—out in the field, in a real-world setting.

Ann: I'm a great believer in grassroots solutions. But we have to create opportunities for community building; we must talk to each other, know what our questions are, and where to start to make those opportunities available at the university level—in part by having forums on broader societal issues and getting talented people involved in discussions. That's very difficult at the grassroots level. Yet we have to start there and challenge people to become involved in a community centered around a shared vision.

Ricardo: In situations where no one feels they have to be right, where you create a "safe environment," creativity and learning thrive, regardless of physical environment. If people feel they are truly stakeholders, and that their opinions will be heard, then they will continue to come back and challenge others.

Ann: As for large organizations, the way to incorporate the learning community concept is to provide each individual

with a way to be part of some learning *community* within the learning *organization*.

Rich: Have the Center's research issue teams been learning communities within our larger organization? Dynamics have differed within each team, ranging from situations where farmer members were basically volunteering land for the research, to farmers actively shaping the research. Can we determine how and why that occurred? Learning communities that are successful often have a goal that does not necessarily end at some fixed point, such as producing "X" bushels of corn; rather, it evolves over time.

Ricardo: A successful learning community's galvanizing element is more

truthfully defined in terms of values than objectives. When a learning community comes together because its members share values, then they're prepared to deal with any situation they confront. That doesn't mean that objectives aren't important, but objectives are smaller than the values that unite them.

Francis: Some of the underlying shared values that bond the Growing the Future group include a desire to see local agriculture become more diversified, benign to the environment, and integrated with nature, and a desire for more local food and energy self-sufficiency. These values are apparent in the projects that Growing the Future chose to undertake.

When Growing the Future was being organized, some participants expected to be told what to do. They found they had to participate to make things happen. When a new issue comes up, if enough people are galvanized by it, a new project and leadership emerge from among those working on the project. We also rotate the chairmanship and have found that when those who have not done so before assume leadership through their own compelling interest, they can be transformed by the process.

Ann: Over time I've also learned the importance of having personal relationships in a learning community. Sometimes we're so interested in getting started on the question or problem that we don't get to know people as individuals.

Ricardo: It's also important to clearly define your community. If you don't include everyone who can contribute to the learning environment, you're missing out.

In the 1860s when the land grants were created, there were certain social needs that the President and the federal legislature decided to address. The institutions were given resources to address those needs effectively. And they did

A learning community's galvanizing element is defined more in terms of values than objectives. When a learning community comes together because its members share values, they can deal with any situation they confront.

so, spectacularly. This approach has been emulated worldwide. But it's not the 1860s anymore.

One indication of a successful learning organization is that the institution itself adjusts to the dynamic nature of its social context and addresses those needs *when they are relevant, not just "post-mortem."*

Ann: We've barely started to turn the corner [at the university]; we're on the very slow upswing of a cycle. The Leopold Center has some good beginnings in its research teams. But our goal can't just be to perpetuate ourselves.

Dennis: The relationship Francis mentioned between the organic farming community and the Leopold Center is a prime example of where we need to work more effectively.

Rich: Are these examples of what we've talked about occurring often enough between local communities, land grants, and community colleges?

Francis: Networking is important. Members of Growing the Future who attended statewide Shared Visions meetings were inspired by what was going on with other groups across the state. This networking provided reinforcement for what we were doing and brought new ideas back to our group.

Ricardo: What Francis has described is building the community. You've got to follow up and get together frequently to discuss and explore.

Francis: Personal development is integral to the whole process. A key word is *allowing* individuals within the group to be who they are, and respecting them for their creativity, beliefs, and lifestyles. That doesn't mean everyone has to agree with everything. But acceptance and respect enhance openness and the courage to disagree.

Dennis: Should the community be a risk-taking group?

Francis: It has to be if it's going to be an open learning community.

Dennis: But the risk, if too great, could dissolve the community. How far do the boundaries go? If it's a group process, will the answer be somewhat conservative?

Ricardo: The group generally wouldn't agree to something that's inimical to it; at the same time, the group must decide how much risk is acceptable as a tradeoff for potential improvements and changes.

Ann: Sometimes people will actually take a greater risk because they have the safe container of the group.

Rich: Group trust and support are very important to that. If they don't exist, there probably won't be much risk taking.

Ann: After that comes personal responsibility. At one Vision 2020 group we discussed how we know the value of something: our checkbook and our calendar. What do you support with your time and your money? If you say you value x, y, or z, but give it no time or money, you're not being honest with yourself.

Ricardo: I see circumstances where people are brought together, but they're not really equals. For instance, the spokesperson for the state's largest commodity group carries more weight than the spokesperson for a small organic vegetable association. That's not a learning community. Members need to know each other and work out solutions that may not be to the exclusive advantage of any one group.

Rich: Steven Covey, author of *The Seven Principles of Highly Effective People* and *First Things First*, says speak first to understand, then to be understood. Making that parallel from the individual to an organization, I see more groups making an effort to be understood than to understand.

Ricardo: The learning community works best when we have a large number of consistently diverse stakeholders who need to inform one another about their needs and circumstances and how they would be affected by a policy decision. Learning communities work best where there's uncertainty, a need for change, and no preplanned knowledge or answers.

Rich: We talk about systems a lot in sustainable agriculture. Likewise, learning communities are a systems approach.

Francis: We're conditioned to think of democracy as the ultimate in decision-making; that if 51 percent of the people agree, we have achieved our goal. In learning communities, consensus building is more important.

Rich: In the Chinese language, the symbol for the concept, "To listen" consists of several components: eyes, ears, and undivided attention, undergirded by the symbol for heart. When we talk about forming community, trying to understand the communication barriers is really important. What are our "filters" when we visit with agribusiness or industry? How can we set preconceptions aside? That's a big challenge to developing new and creative learning organizations and communities.



Swine production initiative approved

With so much attention focused on the future of Iowa's hog industry, the Leopold Center is taking a close look at a promising management option for raising hogs—the use of hooped structures for farrowing and finishing swine. The Center's Advisory Board, which discussed the need for research on this issue at its June 1997 meeting, has recently approved a proposal for research to compare and contrast hoop structures with conventional finishing facilities. This work, to be coordinated by the Center, will draw on the expertise of university animal scientists and Extension staff as well as farmer-cooperators.

Hooped structures have attracted interest because they are potentially as economical as, and more animal-friendly than, conventional systems; they may also generate less odor and other negative environmental impacts than larger systems. However, more

specific questions about pig performance, water quality impacts, odor, and soil quality remain unanswered. The initiative will provide data to help producers make more informed choices about using hooped structures for their swine operations.

Advisory board discussion of the proposal involved location of the research, collaboration and communication with other interested organizations, integration with other University hoop-structure work, direct farmer involvement, and use of on-farm research.

In addition, to allow side-by-side comparisons as part of the research, the center will invest in construction of a confinement facility (a modular building that can be easily modified for other uses) and two hooped structures.

A total first-year investment of approximately \$100,000 is planned.

Calendar of events

- Sept. 23–24**—Iowa Conference on Emerging Environmental Health Issues, hosted by the Center for Health Effects of Environmental Contamination. University of Iowa campus. Contact David Riley (319) 335-4550.
- Oct. 29–30**—Riparian Management Workshop, Ames and central Iowa. Contact Trees Forever, 1-(800)-369-1269 or Tom Isenhardt, (515) 294-8056.
- Nov. 20**—Iowa's Water Quality: Shaping Our Future Together, Des Moines. Contact Linda Appelgate, Iowa Environmental Council (515) 237-5321.
- Early December**—Two alternative swine systems workshops, Oskaloosa and Anamosa. Contact Terry Steinhart (515) 622-2680.
- Dec. 5–6**—Iowa Food Systems Conference, Ames. Contact Shelly Gradwell (515) 294-1923.
- Jan. 29, 1998**—New Directions for Sustainable Management of Apples, Des Moines. Contact Mark Gleason (515) 294-0579.



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