extension review

United States Department of Agriculture Spring/Summer 1988

Peter Myers
Deputy Secretary of Agriculture, USDA

Conserving and Managing Natural Resources—The Challenge to Extension

Cooperative Extension has long been recognized for its major role in developing the agricultural production system which so many of us take great pride in today. This recognition is richly deserved.

Cited by many as a model for technology transfer programs, the Cooperative Extension System is unique in its effectiveness and cooperation. A three-way Federal, state, and local partnership supports Extension, gives direction, and provides volunteer leaders who contribute greatly to the effectiviness of the programs and efficiency of the system. The tie to our land-grant universities also provides for interdisciplinary and research-based educational approaches to assist people in solving problems.

We can look to the past and find many accomplishments by Extension. By its nature, the Extension System is forward looking. The achievements have been great, and the challenges ahead are greater.

One such challenge is to recognize and understand the impacts which our educational programs have upon some of our most basic natural resources—soil, water, forests, rangelands, and wildlife. How can the Cooperative Extension System develop and deliver programs to educate and influence citizens to conserve and manage wisely the use of these basic resources?

As the educational arm of USDA, Extension has an important responsibility in the conservation and management of renewable natural resources. In carrying out that educational responsibility, it complements the roles of three other USDA agencies in natural resource conservation—the Agricultural Stabilization and Conservation Service, the Forest Service, and the Soil Conservation Service.

In response to the conservation challenge, the Extension Committee on Organization and Policy has recognized the need for strengthening its educational programs and has established, as one of its nine national initiatives, that of *Conservation and Management of Natural Resources.*

I commend the Cooperative Extension System for selecting this priority as it moves into the future. We need Extension's educational programs in natural resource conservation and management. As I reflect on the extraordinary success of the Extension system in the development of U.S. agricultural productivity, the question arises: What would happen if Extension mounts an all-out educational response to the challenges of conservation?

Results from such an emphasis would likely be as remarkable as those we see in our agricultural production programs. I personally believe that Extension will make a difference in conservation as it rises to the challenges it has set for itself in this important initiative.

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Extension And Environmental Ethics

Mankind is slowly and painfully learning a very basic lesson: we cannot set ourselves apart from the natural world that sustains us. We know that when we do this we are only sowing the seeds of our destruction. Acceptance of our role as cooperative members of the "land organism" (comprising soil, water, air, and all biologic species) considerably brightens our future.

A key to this cooperative attitude is the development of an ethic of conserving and managing natural resources—an ethic that considers the long-term, as well as the short-term, the biologic as well as the economic. Such an ethic can only be built from the respect for and understanding of our natural environment. Such an ethic will require a level of biological and environmental awareness that has not yet been demonstrated by the whole of society.

Extension has an important role to play both in the development of an environmental ethic and in helping the public make enlightened decisions on conserving and managing natural resources. These critical decisions must be based on input from a wide array of disciplines, from ecology to economics, and from crop management to game management.

Who else is better able to provide this interdisciplinary input than the Extension arm of the land-grant system?

(Continued on page 43)

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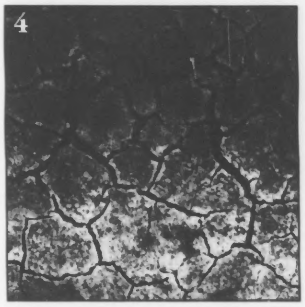

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Drought—Nationwide Extension Network Rallies Resources

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As *Extension Review* goes to press, a top issue of national concern is the drought and its impact on American agriculture and our Nation's natural resources. From the East Coast to the West, the Cooperative Extension national educational network is rallying its staff and resources to work with farmers, ranchers, families, and communities.

Weekly reports from State Extension Services to Extension's electronic mailbox—DROUGHT—are quickly summarized by Extension Service-USDA staff and dispatched via the nationwide DIALCOM electronic network to agriculture program specialists and USDA offices. Of primary interest is information on drought conditions and established and planned drought-related programs. Critical concerns focus on management, economic, and social hardships facing farm families.

Extension federal, state, and county staff are actively participating in the USDA electronic HAYNET operation, which lists hay surpluses and shortages across the country. Statewide HAYNET operations are also available in many drought-affected areas. Calls to both the USDA drought hotline and several state hotlines find Extension staff busy answering questions and dealing one-on-one with the issues and concerns of callers directly impacted by the drought.

Electronic Technology Front and Center

Live satellite videoconferences, news conferences using today's technology, electronic bulletin boards, computers that transmit news releases to print and broadcast media—are just a few of the innovative ways the Cooperative Extension System is getting information to farmers and others.

On July 13, the Iowa State University (ISU) Extension staff aired a 2-hour drought update at a videoconference and sent it, live, by satellite to thousands of viewers at 79 county Extension sites and to others with home satellite dishes in Iowa and out-of-state locations.

The program, produced by the Extension staff, focused on how the drought is affecting cattle and pigs, with information for farmers from Extension agronomists, economists, and animal science specialists. Experts from USDA's Agricultural Stabilization and Conservation Service and the Iowa Department of Natural Resources also participated.

North Dakota Extension also used new technology to expand their news coverage of the drought. Staffers held a July 1 news conference in Fargo and, upon request, sent a news release, weather map, and charts by telefax machine showing crop and other losses to Governor George Sinner in Bismarck and to Representatives Byron Dorgan, Quentin Burdick, and Kent Conrad in Washington, D.C.

ND Extension staff also developed an interview series of four 15-minute videotapes on the drought and its effect on families. Copies of the series, "From Field to Family," will be available to the public through county Extension offices.

Other state Extension Services in the Midwest using modern communication equipment to update their public on the drought include:

- Missouri, where staffers use computers and electronic bulletin boards to transmit drought information to 114 counties.
- Minnesota, where Deputy Secretary of Agriculture Peter C. Meyers appeared live via satellite from Washington, D.C. on a drought special aired on WCCO-TV in Minneapolis.
- Indiana, where the Purdue University Extension staff provides weekly satellite video drought updates for agricultural producers, agribusinesses, marketers, and county Extension agents.

Other State Developments

In Kentucky, nine Extension agricultural specialists were featured on a 3-hour evening radio call-in show. The program was put together by WHAS Farm and Garden Director Fred Wiche and Jefferson County Extension Agent Dean Wallace.

In Pennsylvania, a hay and grain information network—PA HayNet is available on the Extension statewide computer network, PENpages, available to all county Extension offices.

Ohio staffers are using a "loop" system to supply information to county agents. Agents relay client questions for technical information to the Agriculture Industry Office. That office directs these questions to appropriate specialists, who immediately respond via electronic mail to ALL counties.

Georgia Extension's drought response team has released information packets related to forages, alternative feeds, heat stress and related subjects. Another packet released through county offices targets urban residents. Topics include water conservation in homes and survival strategies for outdoor landscape plants—all in anticipation of a total outdoor watering ban because of a low reservoir level.

Human Element

In all of these cases, it's that human element—of farmer helping farmer—that prevails. In North Carolina, two Extension agents are contacting 500 area cattle producers requesting them to donate hay for shipment to drought-stricken Midwest farmers. It was these Midwest farmers who shipped tons of hay to North Carolina producers during the 1986 Southeastern drought situation. ▲

To Save The Soil

A mix of traditional and nontraditional methods have contributed to the success of two Extension efforts in Nebraska to save soil and curb groundwater pollution. Some Nebraska fields show an annual loss to erosion exceeding 100 tons per acre, compared to an average allowable soil loss of 5 tons per acre for the same soil.

With soil being lost to erosion at an alarming rate, and subsequent sedimentation identified as a major water quality problem, the need for a specific, locally targeted Extension education program became apparent.

First Project
While not yet complete, separate projects initiated in 1983 and 1985 are already paying off by saving substantial amounts of soil.

The first major effort to enhance the adoption of soil, water and energy conservation practices in the state began in 1983. Funding of over $1 million came from the State of Nebraska, energy overcharge funds, and the University of Nebraska Foundation.

The 5-year Agricultural Energy Conservation Project (AECP) began with a goal of reducing energy requirements while conserving soil and water. It included, in addition to the conservation tillage emphasis in the east, an ecofallow program in the west, and an irrigation water management project in central/north central areas.

The conservation tillage program includes three target areas encompassing 540,000 acres in portions of seven eastern Nebraska counties.

Its goals are to increase the use of conservation tillage by 20 percent and no-till planting by 10 percent.

Second Project
The second educational program, initiated in 1985, is the Logan Creek Special Study (LCSS). This target area includes approximately 50,000 acres in portions of three Nebraska counties. The LCSS, funded by the Soil Conservation Service, is supported by the Lower Elkhorn Natural Resources District.

The Logan Creek area is characterized by steep, irregular hills. Conservation land treatment is not an accepted practice in the area. Less than 15 percent of the cropland had adequate erosion protection at the outset of the project—with a resulting annual erosion of approximately 14 tons per acre. In addition to conservation tillage and no-till, the LCSS actively promoted practices such as terraces, grassed waterways, and contour farming in these areas.

At the outset, tradition was an obstacle. How do you talk to a farmer about erosion control when the erosion on his/her land has caused no significant productivity losses? How do you convince a farmer to adopt conservation tillage practices when he or she is concerned about possible yield losses or increased weed control requirements?

Targeting Priority Areas
An important and unique aspect of both projects was selection or targeting of high priority areas. Criteria for selection of the target areas included estimated soil erosion losses, farmer use and interest in conservation tillage, and the local Extension agent's desire to make conservation tillage a major educational thrust in the program.

Extension programming methods such as meetings, field days, and demonstration plots were used extensively in both projects, but the nature of the problem and program goals called for additional, more nontraditional approaches.

Local committees were formed to provide guidance in defining and determing educational needs and methods best suited for target areas. We tailored programs to meet the specific needs of target areas. Committee membership included farmers, business reps, and personnel from local Natural Resource Districts, SCS, and Extension offices. Local media and farmers not using conservation practices were also included to ensure success.

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Agricultural engineer Robert Grisso (right) of the University of Nebraska-Lincoln instructs farmers in calibrating a sprayer. Proper sprayer calibration plays an important role in management of conservation tillage systems. Hands-on experience is an important part of this educational program.

Contributions and ideas from farmers not using conservation tillage proved valuable, and activities were designed to overcome concerns and myths often expressed by non-users.

Project Activities

Three Extension assistants began working in the four target areas—two for AECP and one for LCSS. These assistants conducted day-to-day project activities and worked directly, often one-on-one, with producers.

Early in both projects, we collected information to evaluate farmer perceptions regarding conservation tillage and the existing use of conservation practices through mail surveys, field residue measurements, and personal consultations.

Local committees recommended field demonstrations, plot comparisons, and informational meetings for each target area. Nearly 50 farmer cooperators provided sites for conservation tillage demonstration plots. Area farmers could inspect equipment used, follow the growth of the crop, and determine yield and production costs.

Comparing plots gave us evidence to dispel the perceptions that conservation planting reduces yields and increases costs. In all cases, yields were the same or better with conservation methods and in most cases, costs were the same or lower than with conventional tillage.

Local small group, or "coffee house" meetings, were held where Extension personnel answered specific questions regarding individual operations. Press releases and fact sheets were frequently used, and in the LCSS a quarterly newsletter, kept producers and landowners in the target areas informed.

Progress To Date

Neither project has been completed, but we are well on the way to achieving our goal. So far, about one-fourth, or 130,000 acres, of cropland in the AECP area has been directly impacted by the program, for an estimated annual savings of 700,000 tons of soil, 100,000 gallons of fuel, and 21,000 hours of labor. In the LCSS, 266,000 feet of terraces have been installed for an estimated annual soil erosion reduction of 27 percent.

We expect to meet our project goals or exceed them. Most importantly, these two Nebraska projects are proof that conservation education programs targeted to specific audiences can make substantial impact in a short period of time.

Farmers gather at a no-till demonstration that is part of Nebraska's Agricultural Energy Conservation Project. This 5-year project has as its goals the reduction of energy requirements and the conservation of soil and water.

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Why Trees Are Important

Terry Mathis
County Extension Agent,
Aiken County,
South Carolina

As part of a forestry school enrichment program developed by the National 4-H Council, County Extension Agent Terry Mathis (right), Aiken County, South Carolina, role-plays with students. This skit is intended to show youth why planting trees will benefit them in the future.

Will the next generation of Americans be affected by a shortage of wood products? Currently, the South supplies 45 percent of the Nation's demand for softwood (pine). By 2030, forecasts predict a doubled demand for softwood. The South will be expected to meet 55 percent of this total.

In South Carolina, a major timber supplying state, planned regeneration on private forest lands is occurring on less than half the number of acres being harvested. In addition, much of the marginal acreage which needs to be reforested with pine trees has been idled because of the poor farm economy.

Because the next generation may be most affected by a shortage of wood products, 4-H in Aiken County, South Carolina, has developed a forestry school enrichment program for youth: "Why Trees Are Important." The 1-hour program, targeted for grades 6 to 8, has as its objectives increased knowledge about trees, awareness of their importance, and the ways reforestation will affect the students' future.

Program development begins with a slide/tape presentation developed by the National 4-H Council: "Why Trees Are Important." 4-H'ers re-recorded the tape with assistance from a local communications company. A skit and a handout were developed to accompany the slide/tape program.

Instructive Role-Playing

In the skit, which follows the slide/tape program, five students role-play as two landowners, a tax collector, a tree planter, and a tree buyer. The skit is intended to show the class why planting trees can benefit them in the future. One landowner plants an imagined stand of pine trees and manages his land; the other landowner allows his land to lie idle, thereby reaping weeds and "undesirable" trees.

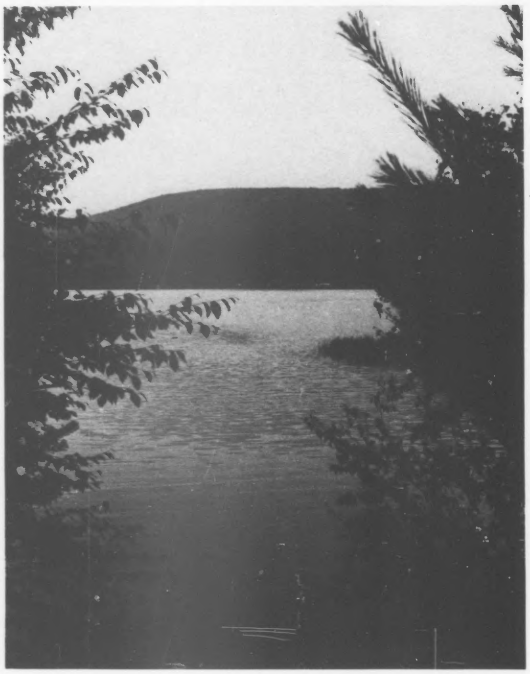
The role-playing students then use YIELD, a computer program developed by the Tennessee Valley Authority, to generate examples for a 30-year pine rotation on average land. The computer program's results for the pine rotation shows the students that a return of $766 per acre can be expected by growing trees. This contrasts with the landowner who let the land lie idle and received no income.

After the skit, the students receive a handout to take home to their parents. The handout informs parents that their child's class participated in a 4-H forestry school enrichment program and encourages them to contact Extension for information on forestry. Parents also receive several pine seedlings, provided by a local forestry company, to plant where they desire

Program Impact

During 1986 and 1987, approximately 900 students attended the forestry school enrichment program. A 1987 statistical test of significance evaluated the impact the program had on 573 students. There was an observed improvement among students in both knowledge and attitude in regard to the importance of trees.

BROOK—Tool For Watershed Management



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BROOK, a "mainframe" computer model, adapted for use in Connecticut and Massachusetts, is a planning tool designed so forest managers can predict the effects of proposed changes on forested watersheds. Figures 1, 2, and 3 are based on watershed data from the Ashley Reservoir, part of the Pittsfield municipal water system.

Many communities across the nation are taking positive steps to solve their water supply problems, including conservation measures. However, until recently, forest management specialists rarely sought solutions to the supply problem at the source itself—the watershed.

This approach, which can be used to supplement other conservation measures, seeks to increase water supplies by managing the watershed's forests. Research studies have demonstrated that available water from forested watersheds in the Northeast can be increased by decreasing the forest cover. This decrease serves to reduce the evaporation from tree canopies and transpiration losses through the foliage and thus increases streamflows. In the Northeast, the primary benefit is during the low-flow period, generally in August and September, when water supplies are most highly stressed.

BROOK—Important Planning Tool

Until recently, the complex, interactive processes taking place in the forest ecosystem have been extremely difficult to translate into forest management practices which could be quantitatively predictable regarding their effect on water yields.

BROOK is changing all that. BROOK, a U.S. Forest Service hydrologic "mainframe" computer model adapted for use in Connecticut and Massachusetts, is allowing the forest manager a new predictive capacity to view the impacts of changing relationships between soil, water, and vegetation *before* any changes are made in the forest.

The current version of the model (BROOK-6) is designed to be employed by land use managers to predict the effects of proposed changes on the land surface. The model is designed to simulate daily fluxes of streamflow, soil moisture, groundwater flow, evapotranspiration, snowmelt, and other water cycle processes for any period for which data is available. The model can be used to predict the quantity and timing of streamflow changes resulting from a variety of forest management prescriptions. BROOK is a planning tool and not a model that can yield detailed engineering data such as culvert sizes.

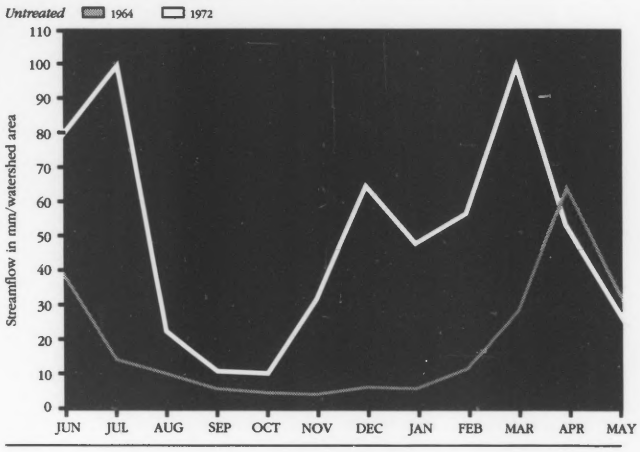
Testing

To test the model, the Northeast Center For Rural Development at The Pennsylvania State University provided joint funding to Cooperative Extension at the Universities of Connecticut and Massachusetts. Also planned was the development of a user-friendly manual to aid in the use of the model in the Northeast.

A second year of funding allowed refinement of the model and promotion of the concept in other northeastern states.

FIGURE 1

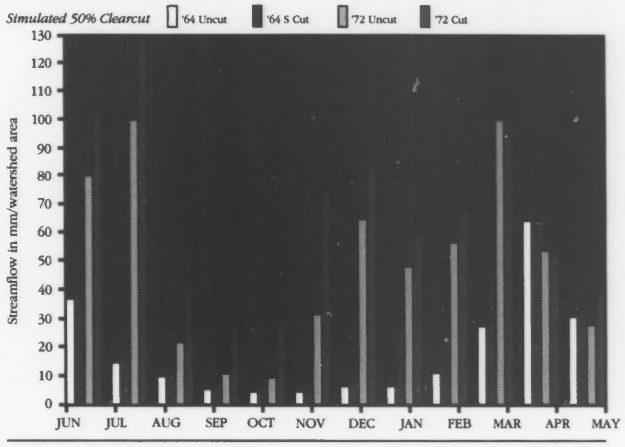
Streamflow - Ashley Watershed
Pittsfield, MA Municipal Water Supply



Watershed

The Ashley Reservoir watershed, part of the Pittsfield municipal water system, was used as a test case. Watershed data were entered into the computer and the driest year of record (1964) and the wettest year of record (1972) were used to establish the extremes of precipitation. (See figure 1.) Therefore, any treatment of the forest which has an effect on the fate of precipitation, such as streamflow, could be measurable between those extremes.

FIGURE 2
Streamflow - Ashley Watershed
Pittsfield, MA Municipal Water Supply



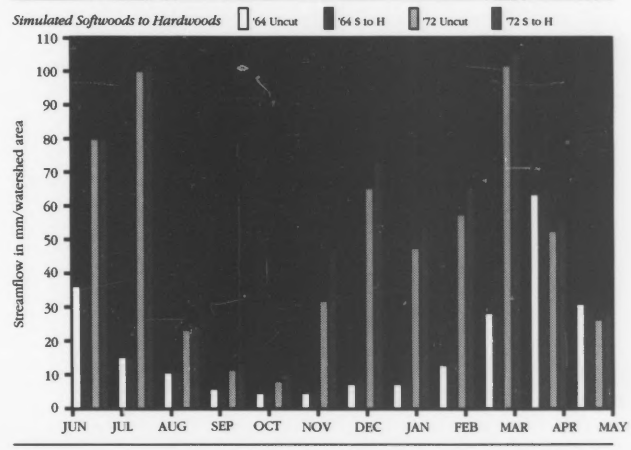
The precipitation extremes may be used to predict the range of effects of forest cutting on streamflow. A forest manager wishing to predict the minimal or most conservative gains in streamflow through vegetative manipulation would look to the dry year simulation as shown in figure 2. When the untreated dried year condition (64 UN) is contrasted with the 50 percent clearcut condition (64 CUT), modest but definite gains in streamflow during the growing season can be identified. This is because after the forest canopy is reduced less water would have evaporated and transpired to the atmosphere.

The range of streamflow differences—associated with varying forest treatments—can guide the management strategy of the forester.

Another method of reducing evaporation and transpiration is to minimize the amount of coniferous forest species. Conifers retain their foliage all year and intercept and evaporate water before, during, and after the growing season of deciduous hardwoods.

Figure 3 depicts the results of a simulated conversion of conifers to hardwoods on the Ashley watershed. Virtually no streamflow change is in evidence during the growing season as hardwoods and conifers are evaporating and transpiring water nearly equally.

FIGURE 3
Streamflow - Ashley Watershed
Pittsfield, MA Municipal Water Supply



Simulation Lessons
The simulations showed that the effect of forest cover on hydrologic processes can be modeled on a microcomputer to provide a predictive capability for land managers.

- The simulations indicated that "clearcutting" can substantially affect streamflow, but this will necessitate increased attention to erosion control strategies.

- Conversion of conifers to hardwoods will result in greater streamflows, especially when the ratio of conifers to hardwoods is high. These streamflows will occur in seasons when it is least needed.

- The simulations in this modeling exercise were "wet/dry year extremes" and applications will show model outputs somewhere between these extremes.

- Timber cutting as a water conservation measure is a valuable concept and constitutes one more option among many to conserve water. These conservation measures include water system rehabilitation, leak detection, and water conservation education.

Buried Treasures—Michigan's Bottomland Preserves

Sites of the seven permanently established Great Lakes state bottomland preserves.

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More than half the state of Michigan—38,000 square miles—lies submerged beneath the surface of the world's largest system of freshwater—the Great Lakes. The depths of these "sweetwater seas" shelter natural, geologic and historic treasures—unique resources that require conservation and management if they are to be preserved for future generations.

Since the lakes—Superior, Michigan, Huron, Erie, and Ontario—assumed their current shape 11,000 years ago, people have travelled aboard watercraft of all descriptions along their shores and across their vast surfaces.

Shipping played a particularly significant role in the settlement of Michigan, and much of the history of the state is closely linked to the ships that have plied its Great Lakes waters.

However, during the past 300 years, more than 6,000 boats have failed to reach their destinations, ending their journeys at the bottom of the lakes before reaching port.

For years some treasure-seekers have sought out shipwrecks in hopes of salvaging articles of value known or believed to have been aboard the vessels when they sank. Although Great Lakes shipwrecks had not been plundered to a significant degree, there was increasing concern in the early 1970s that these resources needed special protection. A 2-year study produced an inventory of the thousands of vessels lost on the lakes. By 1977, Donald F. Holecek, a Michigan State University professor in the Department of Park and Recreation Resources, initiated a Sea Grant-sponsored study and began promoting the concept of underwater preserves in the Michigan waters of the Great Lakes.

Bottomland Preserves

Holecek's finding of significant concentrations of recognizable shipwrecks in certain accessible areas of the coast attracted the interest of historians, archaeologists, recreation planners, scuba divers, Extension agents and many others. In 1980, their efforts spurred the legislature to enact Public Act 184, which enables the Michigan Department of Natural Resources to establish bottomland preserves "to preserve and protect property of historical, cultural, or recreational value..." This Act regulates the types of artifacts and related resources which may be taken by divers from protected areas.

A bottomland preserve is simply an area set aside for the protection of natural and, in this case, historical/archaeological resources. It is not a state park in the sense that other areas operated by the Department of Natural Resources are. It has no entry fee, personnel, physical facilities or developed attractions. It is more like a wilderness area, protected yet accessible to those with the interest and necessary skill.

So far, seven Michigan Great Lakes state bottomland preserves have been permanently established: The Alger Preserve in Lake Superior at Munising and the Thunder Bay Preserve in Lake Huron at Alpena (1981); the Straits Area Preserve in the Straits of Mackinac (1983); the Thumb Area Preserve in Lake Huron (1985); the Whitefish Point Preserve in Lake Superior (1987); and the Sanilac Shores in Lake Huron and Manitou Passage in Lake Michigan (1988).

The July 1986 discovery of the remains of the Canadian package freighter *Regina* discovered in Lake Huron near Port Sanilac stimulated interest among sport divers and those interested in bottomland preserves. In an unprecedented move, the state created, on an emergency basis, a preserve in a square mile area around the wreck to prevent salvage activity and to allow for investigation of a potentially larger preserve area. Sea Grant Extension assisted in the transition from emergency to permanent designation in May 1988 of what is now called Sanilac Shores.

Manitou Passage

Already the site of a national lakeshore, the Manitou Islands area in Lake Michigan will soon become the location of the first preserve located entirely within that lake. Assisted by Extension personnel, both diving and maritime history enthusiasts in the northwest Lower Peninsula have been working since late 1986 on the proposal which is now in the final stages of approval.

Maritime historians believe that there about 60 undiscovered wrecks in Manitou Passage waters. The prospect of finding one or more of these wrecks could be a powerful attraction to divers.

Legislation Updates

In early 1988, legislators consulted Sea Grant Extension personnel about drafting amendments to Michigan's bottomlands preserves law. The agents

provided valuable insights to these lawmakers as they attempted to improve the protection of these buried treasures and offer greater recreational pleasure to thousands of Great Lakes divers.

Each of these preserves has a special character, and the key to the initial designation, development and subsequent conservation, management and economic benefits has been local citizen involvement and organization, assisted in almost all instances by Cooperative Extension Service staff. Detailed in the following are some examples of Cooperative Extension's involvement.

Alger Attracts Divers and Dollars

The 113-square-mile Alger Bottomland Preserve, with its ten known wrecks and proximity to the Pictured Rocks National Lakeshore, is the best known and developed of the preserves. With wrecks like the 230-foot wooden hull steam barge *Smith Moore* and 150-foot wooden hullschooner *Dreadnaught* or *Granada* (the name is still in dispute), the site has become a prime diver destination. The Alger Underwater Preserve Committee has buoyed several of the wreck sites to increase divers' ease in locating them, and has conducted diving expeditions to find additional wrecks (discovering more underwater caves than wrecks, incidentally). The group has also published a brochure providing such information as diving precautions, preserve rules, a diver emergency action plan, and a map of dive sites and boat launching facilities.

Extension staff assisted the local committee in obtaining both local and state financial support, including a $7,000 "Yes M!ich!gan" grant, to promote the preserve. The community is now experiencing some of the economic benefits of the committee's marketing efforts. As documented through Sea Grant and Cooperative Extension research work, an estimated 6,000 divers and associated tourists spent approximately $3.5 million in the community in 1984, compared with about $700,000 spent by about 1,500 divers in 1980.

Thunder Bay

The 288-square-mile Thunder Bay Preserve holds approximately 85 shipwrecks and at least two "sinkholes"—cylindrical depressions 300 feet wide and 20 and 70 feet deep.

Local interest, supported by Extension staff, initiated the designation of the preserve in 1981. A reactivated local committee, also assisted by CES personnel, has, during the past few years, developed the preserve as a tourist-diver destination. Shipwrecks such as the semi-submerged German "saltie" (seagoing) *Nordmee* and the freighter *Montana* are now visited by dive charter boats.

A 1986 Sea Grant Extension survey of visiting divers found that "friendly people, the charter service, and water clarity" were nearly as important as the shipwrecks and variety of wreck and dive sites.

This preserve area is also the site of one of two of Michigan's operating multi-place hyperbaric chambers. Through efforts of the local Sea Grant Extension agent, and with the financial support of Michigan Sea Grant and the National Undersea Research Program of the National Oceanic and Atmospheric Administration (NOAA), Alpena General Hospital was able to reactivate this piece of life-saving equipment. It is now a treatment center for sick and injured divers, and the lives of several divers have already been saved there.

Sea Grant Extension sponsored a series of dive accident management seminars throughout the state during the spring of 1985 to alert hospital and emergency medical service personnel to the availability of the equipment and to encourage the development of dive accident management plans in all the preserve areas. These plans were then developed and implemented through an effort involving Sea Grant Extension staff and emergency medical personnel throughout the upper Great Lakes region.

Coordinating The Effort

Extension has provided a consistent source of information and support to the local groups that have successfully proposed and promoted designation of Michigan's Great Lakes bottomland preserves. District Extension Sea Grant agents and county Extension directors have worked hand–in–hand with the variety of interest groups which have coalesced around this concept. Extension staff facilitated contact among local communities.

This coordination climaxed in December 1986, with a meeting at which local representatives agreed to form the Michigan Bottomland Preserves Council as an umbrella organization to enhance their effectiveness in promoting preserve tourism.

Extension has also contributed to the council's marketing efforts by collecting some important data. With the assistance of the Michigan Travel, Tourism, and Recreation Resource Center at MSU, Sea Grant Extension supervised two statewide surveys during the summer of 1986 and the winter of 1987. Divers visiting all the state bottomland preserves in 1986 completed a questionnaire, which resulted in an analysis of recreational diving activity in those areas.

Are there more bottomland preserves in Michigan's future? Will they eventually become underwater parks? These questions remain to be answered. However, it seems fair to say, at this point, that wherever there's a bottomland preserve in Michigan's Great Lakes waters, you'll find Cooperative Extension assisting the effort to conserve and manage this important aspect of Michigan's natural resources.

New Forests For Florida

This demonstration plot was part a comprehensive Extension education program to encourage landowners in seven counties to plant pines and manage their forest resources.

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In Florida, 45 percent of the total land area (over 15 1/2 million acres) is commercial forest land. In 1986, the forest industry employed 57,000 persons and received $8 billion in revenue. Yet, 60,000 acres of land are being lost each year to urbanization and accelerated growth.

Three-fourths of the forest land is located in north Florida, which is close to lumber mills and markets, has good soil quality and abundant rainfall, a long growing season, and flatlands. Many of the private landowners have been turning these advantages into profits; others are unaware of such opportunities.

Nonindustrial private landowners own 50 percent of the state's commercial forest land, of which 76 percent could carry more with trees. For every 4 acres harvested, only 1 is replanted. Landowners often own idle or marginal farmland that could be planted with trees to improve the land's productivity. Therefore, in 1984, two Cooperative Extension Service programs were developed and implemented to improve the productivity of nonindustrial private forest land in Florida. These are (1) the seven-county reforestation program and (2) the limited-resources landowners program.

Seven-County Reforestation Program

The Department of Forestry Extension faculty at the University of Florida worked with county Extension faculty to develop and implement a reforestation program for landowners in Washington, Gulf, Taylor, Levy, Duval, Clay, and Putnam Counties. The first objective was to improve productivity of nonindustrial private land by giving owners information on reforestation and forest management practices. The idea was to inform and motivate them. The second objective was to develop a comprehensive educational program that would encourage landowners to plant pines and manage forest resources.

University forestry Extension specialists and county Extension faculties developed and set up a multifaceted educational program that included many methods of information dissemination. "Extension Forestry Update," a monthly newsletter with a circulation of 3,500, provides information on such topics as the Forest Products Price Report, upcoming courses and workshops, new publications, and tips on forest practices that were useful to landowners. Four of the seven counties developed their own newsletters, with circulation ranging from 92 to 450.

Extension staff produced 23 publications to aid landowners in reforesting and managing their produce. Topics included Florida's forest soils, site preparation, forest regeneration methods, planting southern pines, and forestry investment. In addition, landowners can use a series of computer programs, entitled the "Forestry Information System" (FORINSY), to manage their forest lands.

Each year in the 4-year program, forestry Extension specialists held an inservice training session for country Extension faculty. Topic sessions included "Planting Southern Pines," "Forestry As An Investment," "Impacts of Silvicultural Practices on Water Management," and "Use of FORINSY In Forestry."

Extension in the seven counties organized and held 16 workshops and 13 field demonstrations for landowners. Many persons, including Extension forestry specialists and staff from USDA's Agricultural Stabilization And Conservation Service and Soil

Conservation Service, assisted the counties in conducting these workshops and demonstrations. Landowners received forestry information and hands-on experience for reforesting their land, and they participated in discussions on forestry practices.

Other activities included news releases, one-on-one conferences and discussions, announcements at farm meetings, demonstration plots, and radio and television programs. Duval County's television program entitled "Hi Neighbor" covered such topics as the advantages of growing timber, planting and transplanting trees, and tree care. Clay County established a forestry and natural resources advisory committee to help with Extension programming. Department of Forestry Extension office staff answered telephone and written requests for forestry information.

Results

During the program years (1984-87), nearly 25 million seedlings were planted, compared with 15.8 million seedlings in the pre-program baseline years (1980-83). In each program year the number of trees planted exceeded the yearly average for the baseline years. Based on average yields for slash and loblolly pine plantations in north Florida, the expected yield at the end of a 20-year pulpwood rotation is 30 cords per acre. In 1984-87, the average price for pulpwood stumpage has been $28 per standard cord. Using real prices with no inflation factors, we see that the value of the planting made during the program years in the seven counties would be a gross annual revenue of $7,233,245 (in 1987 dollars) for the years 2004-2007. This figure is a 58-percent increase over the annual harvest revenue for the planting during the baseline years, projected at $4,584,636 for the years 2000-2003. If the landowners elected to increase the rotation length and change their harvest objectives to more valuable products such as chip-'n-saw or sawtimber, the dollar returns could easily increase 200 percent.

The intensity of the Extension program in the seven counties had a significant influence on whether there was an increase in tree planting in the program years. The more workshops and demonstrations held, landowners contacted, and newsletters circulated, the greater the results in tree planting. Florida Extension, then, is strongly impacting forestry in the counties. As previously mentioned, in the last decade, Florida lost 60,000 acres of forest land each year. The increasing trend in tree planting seen in these seven counties and in the state is helping to combat this decrease. The Florida Cooperative Extension Service is working effectively with other public agencies and organizations to maintain our forest resources in Florida.

Limited-Resources Landowners Program

In 1984, about 5 percent of Florida's nonindustrial private forest landowners were classified as landowners with limited resources. They were faced with problems in maintaining their farming operation. They were decreasing the number of acres of traditional row crops that they would normally plant and leaving the land idle. If the landowners could use these lands to plant pines for timber, they could maintain agricultural tax assessments for their land and generate additional income.

Our long-range objective for 1984-87 was to increase planting of idle or marginal cropland to pine trees or Christmas trees to help provide additional income for limited-resources landowners. The approach was to develop an educational program which would provide information on forestry practices and on technical and financial assistance available to landowners. The targeted audience was limited-resources landowners in the following counties: Jackson, Gadsden, Jefferson, Madison, Suwannee and Columbia. Limited-resources landowners were defined as persons having a gross annual farm income of less than $20,000.

An educational program was developed by county Extension faculty and Extension specialists at Florida A&M University and the University of Florida. The major teaching tool was field demonstrations to teach farmers tree planting techniques. Eleven timber production and 10 Christmas tree production demonstrations were established in the 6 targeted counties in 1984-87. Besides showing landowners how to plant and manage pines, Extension staff provided information about financial and technical assistance.

At the beginning of the 4-year period, an inservice training program, "Encouraging Limited-Resources Farmers to Plant Pine Seedlings on Idle land," was held for the agricultural technicians and agents participating in the program. Topics highlighted at this session were "Why Plant Trees?", "Cost Sharing Program," and "How to Get Started."

Two publications were produced to address the needs of the limited-resources landowners: (1) "Growing Christmas Trees: Florida A&M Demonstration Project," which reviews the steps for establishing and managing a Christmas tree operation and (2) "Planting Southern Pines," which shows how to plant and manage a pine plantation for timber production.

Other forms of information dissemination included news releases, farm visits, newsletters, and television programs. The monthly newsletter "Extension Forestry Update," published at the University of Florida, was sent to limited-resources landowners. Extension staff made 150 farm visits in the 6 program counties during 1984-87 to provide technical assistance and one-on-one education.

Three television programs with a potential viewing audience of 30,000 were produced and shown.

At the beginning of the impact study, the 88 limited-resources landowners surveyed in the six-county program owned 7,058 acres. Eighteen percent of this land (1,249 acres) was considered idle and available for planting with pine trees. Sixty-four percent of the landowners were interested in planting pines, and 53 percent were familiar with the agencies and assistance programs available to them.

At the end of the 4-year program period, the 88 landowners surveyed owned approximately 5 percent fewer acres. At this time, 17 percent of their land was considered idle, compared with 18 percent at the beginning of the program in 1984. At the end of the program, 228 acres had been planted to pines; 18 percent of the original idle acres. A landowner who had planted 10 acres of idle land in these program years could harvest the forest stand in 20 years. At 30 cords per acre and $28 per cord, the projected gross revenue would be $191,520.

Twenty-two percent of the limited-resources landowners had attended a workshop on planting trees. In addition, 70 percent of those surveyed responded that they had learned about the assistance and support programs for planting trees, an increase from 47 percent at the beginning of the program. At the end of the program, 30 percent of those surveyed were interested in planting pines, down from 64 percent in 1984. This decrease may be due to interest in other crops, the need for understanding the new tax laws, or the need for one-on-one contact with clientele. In 1988-1991, efforts will be implemented to improve our contacts with limited-resources landowners.

Conclusions and Recommendations

The two educational programs discussed here encouraged and aided landowners in reforesting their harvested forest land, poorly stocked forest land, and idle cropland. In the Seven-County Reforestation Program, 58 percent more acres were planted with trees than before. In the Limited-Resources Landowners Program, 18 percent of the landowners' idle acres were planted and the number of landowners aware of assistance programs grew from 47 to 70 percent. Coordination with other state and federal agencies which offer technical and financial assistance continues to be successful.

The next logical step in our Extension program appears to be to promote multiple forest resources management in addition to reforestation. In the next 4 years we will provide information regarding additional forest resources alternatives to the landowner. Some of these resources include wildlife habitat, fee fishing, harvesting pine straw, and recreation. These resources may provide additional income to the landowners and, at the same time, help to maintain and enhance Florida's forest resources.

From Nuisance To Cinderella Tree

June V. Gibson
Information Specialist, Agricultural Publication And Information Office, College of Tropical Agriculture And Human Resources, University of Hawaii at Manoa, Honolulu

Tropical forests cover less than 10 percent of the earth, yet they are home to nearly half of its plant and animal species. Alarm over their loss was once confined to environmentalists and scientists. This is no longer the case. Environmental, ecological, and social concerns about deforestation have claimed the attention of more and more residents of Hawaii.

In addition, scientists are concerned about the effect of deforestation on medical research. One quarter of all prescription drugs are biological in origin, and many of their sources are found only in tropical forests. Will tropical forests become extinct, scientists ask, before they can be studied for other possible cures?

Breakthrough Research

James L. Brewbaker, Extension horticulturist and plant geneticist at the College of Tropical Agriculture and Human Resources, University of Hawaii at Manoa, is conducting fundamental and adaptive research on leucaena trees of great importance in the struggle against deforestation. His breakthrough research allows a new perspective both in Hawaii and in developing tropical countries. Because of its strategic location in the Pacific Rim area, research at the University of Hawaii has a strong international as well as local commitment.

The first leucaena in Hawaii was a common shrub imported from Mexico and called Koa Haole. Found as a weed in pastures and roadsides, it was once viewed as a nuisance and shunned by both farmers and foresters.

But that was before Brewbaker developed the Koa Haole into a tree he calls the Giant Hawaiian. These "Cinderella trees" grow to heights of over 15 feet in a year, stop erosion, increase soil fertility, and furnish protein-rich cattle feed, fertilizer, paper, liquid fuel, firebreaks, and even building materials. In 3 years, Giant Hawaiian trees are large enough to supply the building materials, furniture, and utensils for a house.

International Linkages

Developing countries share Hawaii's concerns about deforestation, soil erosion, and the rising cost of cattle feeds. In addition, these countries have major needs for wood fuel and building materials.

To date, more than 50 tons of seeds of the Giant Hawaiian Leucaena trees (one billion of them) have been distributed by Indian seed sellers to farmers and foresters. Seeds of the Giant Hawaiian have also been distributed in the Phillipines, Taiwan, and many other countries through the support of the United Nations' Food and Agricultural Organization (FAO) and the U.S. Agency for International Development (AID).

James L. Brewbaker, Extension horticulturist at the University of Hawaii At Manoa, displays leaflets of leucaena. Leucaena was once viewed as a common shrub and a nuisance in Hawaii. Brewbaker's research helped to develop the leucaena into a "Cinderella tree" be named the Giant Hawaiian.

Brewbaker, who heads the Nitrogen Fixing Tree Association, with members in more than 100 countries, has been dedicated to creating linkages with local and world agricultural organizations. He hopes to reverse the dangerous trend of "too many people depending on too many trees" with the consequent destruction of tropical forest ecosystems.

Brewbaker points out that "super trees" like the Giant Hawaiian have not had an easy time gaining acceptance by farmers and foresters. But attitudes are changing as Brewbaker and his Extension colleagues educate others in the versatility of this former "weed."

Recognition

At a 1986 ceremony in Stockholm, the King of Sweden, HRM King Carl Gustav, recognized the scope and impact of Brewbaker's contribution when he presented Brewbaker and two of his collegues with the prestigious International Inventors Award. The citation is awarded for outstanding achievements through research in forestry, industry, energy, and water.

Natural Resources For The Next Decade

Marianne E. Krasny
Extension Program Leader, 4-H Natural Resources,
and
Daniel J. Decker
Senior Extension Associate,
Department of Natural Resources,
Cornell University,
Ithaca, New York

As we project the future of 4-H, we are aware of two current trends that are likely to affect us in the 1990s: the "research base" for Extension programs are become increasingly more specialized and complex; more and more urban and suburban youth are expressing an interest in 4-H.

These trends pose a dilemma for 4-H programmers. Since the late 1980s, 4-H has found itself in the midst of a rapidly changing academic and demographic environment. How can 4-H create educational programs, based on the latest "cutting edge" of research from our land-grant universities, that remain attractive to a diverse youth audience? In addition, 4-H natural resources programming faces further challenges:

- To develop programs that span a diversity of subjects such as wildlife, forestry, fisheries, and environmental quality.

- To develop programs that are not traditional to 4-H.

Extension specialists in the 4-H Natural Resources Program at Cornell University believe three factors are essential to address these challenges: There must be a meaningful integration of the 4-H program into Cornell's Department of Natural Resources; open communications must be established between county 4-H agents and faculty program leaders; and cooperation must be fostered between 4-H and agencies, private organizations, and industries with an interest in natural resources education.

Natural Resources—A Continuum
James P. Lassoie, Extension leader and associate professor, Department of Natural Resources, Cornell University, views natural resources education in New York State as a continuum.

"We should begin with our 4-H audience," Lassoie points out. "Some of these youths become our undergraduate and graduate students and later continue their education through the adult Extension programs. Therefore, our Extension faculty needs to be concerned with the undergraduate curriculum just as our teaching faculty needs to be concerned with 4-H. At each level—youth, student, and adult—the implications of our department's research program should be fully understood."

To promote the integration of the 4-H program into department teaching, adult Extension, and research programs, Extension at Cornell and the Department of Natural Resources have decided to hire a 4-H natural resources program leader who would be a member of the research faculty in the department. This has led to discussions of how research results might be included in 4-H Extension programs.

New Concepts, New Audiences
Many believe that conservation biology—new to wildlife research—is an area where youth, college students, and adults can benefit from information. Conservation biologists are developing methods for the protection, maintenance, and restoration of life on earth based on ecological and genetic principles.

In a new wildlife habitat enhancement program, aimed at urban and suburban youth, research findings from conservation biology are helping youth understand how land-use strategies can help or harm our natural environment.

Science Interns Program
The Cornell Science Interns Program provides another opportunity for linking 4-H with the Department of Natural Resources. This program allows high school 4-H'ers to work with Cornell faculty and graduate students on research projects during the summer months.

In 1987, science interns participated in two research projects. One project involved the effect of acid rain on fish populations. The other concerned the relationship of sugar maple leaf area to sap production. A science intern from the Akwesasne Indian Reservation in northern New York state wrote the following in his final report: "I learned there are no shortcuts while conducting research. Research data must be very detailed and precise. This summer experience gave me a better understanding of many new and interesting career opportunities."

Cooperative Programming
A 1986 survey of 40 4-H agents with natural resources responsibilities in New York State revealed that over two-thirds of these respondents identified both "fisheries" and "environmental quality" as areas in need of program development at Cornell.

Master Anglers
Specialists in 4-H Natural Resources at Cornell, motivated to develop an aquatic resources education program, noted that several New York counties had already pioneered an innovative and successful fisheries education program known as Master Anglers.

Master Anglers is based on the Master Gardener concept and provides 25 hours of instruction in fisheries ecology and management, sportsmanship and ethics, handling of fish and seafood preparation, angling techniques, and teaching techniques. Upon completion of the course, Master Anglers become volunteer sportfishing educators. They then proceed to teach basic angling skills and conservation principles to adults and youth in their communities.

"Our strategy is first to get young people interested in fishing," says Robert Kent, 4-H agent in Suffolk County and one of the initiators of Master Anglers. "After we teach them how to be successful anglers, we get them concerned and involved with fisheries conservation issues."

Even as the Master Anglers program was achieving statewide and national recognition, it still had two important needs: a manual that could be used in Master Angler training and by Master Anglers in their teaching activities, and a way of promoting the Master Angler program throughout the 57 New York counties and New York City.

Aquatic Resources Education

Recent cooperative efforts between the New York State Department of Environmental Conservation (NYSDEC), County 4-H agents, and the Department of Natural Resources at Cornell are making a Sportfishing/Aquatic Resources Education Program a reality.

NYSDEC has provided initial funding to underwrite the costs of producing a manual and conducting six statewide training sessions. NYSDEC fisheries managers will also provide technical expertise. 4-H agents have contributed their experience from the Master Anglers program and their enthusiasm for working with volunteer leaders in their communities. Faculty in the Department of Natural Resources at Cornell are coordinating this program, including the production and evaluation of educational materials.

Sea Grant is making additional contributions to the program by providing financial support for the manual and technical expertise. The Sport Fishing Institute is donating 1,000 quality rods and reels to the program.

The 4-H program is vital to accomplishing Extension's goal of improving the environmental well-being of our communities. Through such "hands-on" experiences as improving wildlife habitats, participating in scientific research, and sportfishing, youth learn basic biological, ecological, and resource management principles. And they become better equipped to make important decisions regarding their personal role in the conservation and management of natural resources.

Natural Resource Organizations Schedule Fall D.C. Conference

Betty Fleming
Public Affairs Specialist,
Extension Service, USDA

Natural Resources and the 21st Century

Outstanding experts from government, universities, and the private sector will address participants at the "Natural Resources For The 21st Century" Conference to be held November 14—17 at the Twin Bridges Marriott Hotel in Washington, D.C.

The conference will be sponsored by many natural resource organizations, including the American Forestry Association, Society of American Foresters, and the Wildlife Management Institute. Among the USDA agencies represented are Extension Service, Soil Conservation Service, Fish and Wildlife Service, and Forest Service. This is the first time that so many natural resource groups have banded together for a combined meeting.

Broad topic areas include: status and trends of America's major renewable resources; factors affecting resource availability and use; challenges, opportunities, and choices; and integrating resource understanding and management.

Extension Service and Forest Service, USDA, and the American Forestry Association will sponsor wrap-around meetings for their personnel and members during the week, and after the conference closes. Meetings and tours are scheduled for November 17 and 18.

For more information, contact:
American Forestry Association
P.O. Box 2000
Washington, D.C. 20013
Phone: (202) 667-3300

The New Fungus Among Us

Scott Turner
Associate Extension Editor,
The Ohio State University,
Columbus

Centuries ago, Europeans traveled to the Orient to bring back the secrets of the Far East. They returned with soy, silk, jade—and fungi.

Shiitake mushrooms had come into the light.

The taste, some say, is a cross between meat and vegetable. Sauteed or fried, its texture is similar to lobster. Shiitake is Japan's chief export crop.

Look for shiitake in your local grocery stores and restaurants. The United States imports more than $1 million worth each year. Most of that is in dehydrated form. Now, Americans are growing and marketing fresh shiitakes.

Ohio Shiitake
In 1984, specialists at Ohio Extension first discussed growing shiitake in Ohio. The reasons: Ohio oak trees are similar to the trees used to grow shiitake in Japan. Ohio climates are similar to those where shiitake grows in Japan.

In the spring of 1985, Ohio Extension decided to study shiitake's feasibility as an Ohio crop. Ohio Extension received the blessing of the Ohio Department of Agriculture as well as a 2-year, $25,000 grant to research shiitake.

Steve Bratkovich, Extension district forestry specialist, was tagged to head the project. He set up a test site at Canter's Cave 4-H Camp north of Jackson. His objectives were to see if the mushroom could grow outdoors in Ohio's climate, determine good management practices for the climate, document potential production costs, and study marketing opportunities.

Research Project
Bratkovich and seven volunteers—who agreed to try growing shiitake on private sites—began log piling, hole drilling, spawn inoculation, watering, and waiting. But the wait wasn't long. Although shiitake literature says the first harvest is usually a year or two after inoculation, the Canter's Cave oak logs produced a small crop in the fall of 1985. In 1986 and 1987, the same logs fruited continually, from spring through fall.

For 2 years, Bratkovich and the volunteers experimented and identified the best logs, tools, and spawn strain for shiitake production in Ohio. Thousands of holes were drilled, filled with spawn, then sealed.

Bratkovich had the best results from a shiitake spawn strain from a company in Virginia.

"But we found that growing shiitake is site-specific," he says. "A type of shiitake strain or a production technique that works for me may not work for the person down the road. Each new shiitake-growing venture will be experimental."

After 2 years of collecting and compiling data, Bratkovich completed a technical summary of his research. It's available by mail to those interested in growing shiitake.

Marketing Information
But getting out marketing information is as important to Extension as giving production tips.

"Education is the key to marketing shiitake in Ohio," says Greg Passewitz, Ohio Extension specialist in community and natural resources development. "We've shown people how to grow it, but most Ohioans have never heard of the mushroom. Most growers will probably only grow small amounts of shiitake. They'll need the marketing power that an association or cooperative can offer."

Passewitz recently finished a 2-year study called "Marketing Ohio's Shiitake Mushrooms." He says that hundreds of Ohioans are interested in shiitake, but only 30 are active growers and about 10 sold shiitake in Ohio in 1987. The smallest producers sold 5 to 10 pounds of shiitake. The largest producer sold 350 pounds of shiitake in 1987 to a Columbus produce distributor.

The study contains interviews with shiitake buyers and information on everything from proper packaging to advertising and promotion.

Computer Consultant
Currently, Bratkovich is developing a computer program to analyze the potential return for prospective growers.

"I'll be able to plug in all the cost variables, from those for wood to those for spawn," Bratkovich says. "I'll also be able to account for price fluctuations. This will help Ohioans understand the economics of growing a product that presently has a low demand and is fairly labor intensive."

"Growing the mushroom sounds romantic to some people," Passewitz comments. "But shiitake is still a very new product. Most of it in Ohio is still imported and it costs up to $12 a pound in the supermarket. Ohio markets can't absorb many mushrooms at this point. For this infant industry to take off, we need publicity and united growers." (Continued on Page 20)

Steve Bratkovich, Extension district forestry specialist in Ohio, who led a shiitake mushroom research project in that state, kneels to examine an oak log sprouting with this exotic foodstuff from the Orient. This research by Ohio Extension has prompted small-scale shiitake production at sites across the state.

Extension forestry specialist injects shiitake spawn into hole drilled in oak log. At Canter's Cave 4-H Camp near Jackson, four spawn strains from three commercial suppliers were used to test the mushroom.

Passewitz says that while some Ohio growers sell directly to retailers, such as grocery chains and restaurants, businesses prefer to deal with someone who can guarantee consistent quality and quantity. In the next few years, he expects to see three or four "shiitake brokers" become established. They'll be able to offer consistent quality and quantity to meet what he hopes will be a growing demand.

Association Formed

In 1987, Passewitz and Bratkovich helped form the Ohio Shiitake Mushroom Association, a group of growers or potential growers interested in strengthening the market for shiitakes in Ohio and spreading the word about the mushroom across the state.

"The association has already conducted several programs on shiitake growing," Bratkovich says. "As growers, they have a great perspective and can educate Ohioans about the mushroom."

Mike Omler is president of the 50-member association. He grows shiitake and several other mushroom species in a large building near his tobacco fields in Hillsboro. Omler emphasizes the importance of marketing. "Our biggest problem is being sure we can sell it once we've grown it," Omler says. "We need to unite growers to strengthen selling power and make growers 'price makers' not 'price takers'."

Since 1985, Bratkovich has provided basic information to those interested in growing shiitake. He's given many talks across Ohio about the shiitake experiment. Hundreds have attended the programs.

So far, Bratkovich has answered more than 2,000 information requests, one from as far away as Singapore, on starting a shiitake-growing operation. Currently, he has a mailing list of more than 400 names. For a one-time fee of $2 people receive a packet of information plus periodical mailings of research, production, or marketing updates.

Classroom In The Woods

Larkin Wade
Head, Extension Natural Resources, School of Forestry, Auburn University, Alabama

"A Classroom in the Woods" is a fitting title for the 4-H club program that is educating youth in conservation in Coosa County, Alabama. To date, 46 4-H'ers have literally gone into the woods to learn firsthand about wildlife, forestry, and soil conservation.

For the program, developed by Extension 4-H County Agent Roger Vines, Auburn University, 4-H'ers are fortunate enough to have their own woods, a 46-acre plot with fish ponds, trees, and wildlife. Air Force Colonel Jack Walls, a former Coosa County resident, presented the 4-H'ers with a long-term lease on the land.

For almost 3 years, 4-H'ers have worked on this acreage. They have cut brush, planted pines, restocked the ponds with bass, bream, and catfish, and planted cover crops to stop erosion. They have also established food plots for wildlife and built nesting boxes for wood ducks.

"We foresee the land becoming a model forestry-wildlife-conservation area," Vines says. "But the real value is that the boys and girls are participating in a hands-on educational experience that develops an appreciation for wildlife, forestry, and conservation."

Mosley Awards Program

Vines did not get involved in this educational project by chance. He became enthusiastic when the project was awarded a $2000 development grant by The W. Kelly Mosley Environmental Awards Program in Alabama. This awards program not only provides grants to advance knowledge and development of forestry, wildlife, and related resources, but also provides $500 achievement awards.

For almost a decade, the W. Kelly Mosley Environmental Awards Program has sought to recognize those who encourage the use of sound forestry and multiple-use practices.

Roger Vines, Coosa County Extension agent, Alabama, (kneeling, far right) relates information about wildlife food plantings to 4-H club members. His "Classroom In The Woods" project teaches youth firsthand about conservation, forestry, and wildlife.

In 1978, W. Kelly Mosley, a dedicated environmentalist, first approached Alabama Cooperative Extension at Auburn University, to express his concern for the wise use of forest resources. "Wise development and use of forestland has brought me much joy and happiness," he stated. "I would like to do everything I can to help others have the same pleasure."

Motivation: Better Conservation

Mosley believed an awards program might be the best motivation to encourage 200,000 Alabama landowners to conserve and manage natural resources. Motivational research has shown that recognition induces efforts that otherwise would not have been made. By spotlighting the achievements of those who are either outstanding practitioners of multiple-use forestry or whose work contributes to that practice, this recognition encourages wise use of forest resources.

The program is financed by W. Kelly Mosley and the John and Mary Franklin Foundation through an annual gift of $15,000 to the Auburn Generations Funds. An Extension forestry specialist spends about 2 months coordinating the program within the natural resources community. An 11-member committee, composed of university and nonuniversity officials who represent natural resources organizations, meet quarterly to review nominations and confer awards.

The committee's actions are governed by a set of rules, regulations, bylaws, and criteria for selecting recipients. The availability of the program to the natural resources community is continuously promoted through three brochures, news articles, and other means.

Award Recognition

After 8 years of Mosley Awards recognition programs there have been 140 award recipients from 45 of Alabama's 67 counties. Each recipient receives a framed reproduction of a forestry-wildlife painting, a plaque recognizing his or her achievement, and a $500 achievement award check.

The press coverage following the program usually amounts to more than 425 news and magazine articles. Approximately 150 radio and TV programs report about the recipients and their natural resources achievement.

Recognition does produce results!

The Conservation Planning Crunch

Doug Peterson
Extension Communications Specialist, University of Illinois, Urbana

During the next 2 years, Soil Conservation Service (SCS) personnel in some states will help develop the same number or more conservation plans than they helped develop over the last 53 years.

In Illinois, for instance, SCS estimates that 70,000 conservation plans will have to be developed by 1990, which is roughly the same number that has been developed since SCS began in 1935.

The reason for the sudden flood of conservation planning is the Food Security Act of 1985, which introduced what has become known as "the conservation provisions." Essentially, the provisions say that a large number of producers who have highly erodible cropland fields will have to develop conservation plans by 1990. Otherwise, they risk the loss of many USDA program benefits. In addition, the plans must be fully implemented by 1995.

To handle the workload increase, conservationists realized that one-on-one work with producers was no longer practical. Therefore, in late 1986, Robert Walker, retired University of Illinois Extension natural resources specialist, and Raymond Herman, SCS state resource conservationist in Illinois, came up with a proposal: Develop a program for teaching producers, in a *group* setting, how to construct conservation plans.

Conservation Package

The result was the Conservation Systems Workshop, a package of materials tailored to an array of conservation planning needs across the country. The package includes a 162-page manual, 98 overheads, five slide programs, seven work sheets, and one video.

"The manual is aimed at instructors who will be conducting conservation planning workshops," says Richard Farnsworth, a University of Illinois agricultural economist. He directed the program along with Walker and Herman. Communications support was provided by the University of Illinois Office of Agriculture, Communications, and Extension Education.

Herman notes that the new conservation planning materials serve a dual purpose. "Not only will they be used to teach producers how to develop conservation plans," he says, "but several states have expressed an interest in using them to train SCS employees."

Workshop Units

The *Conservation Systems Workshop* manual is broken into six units:

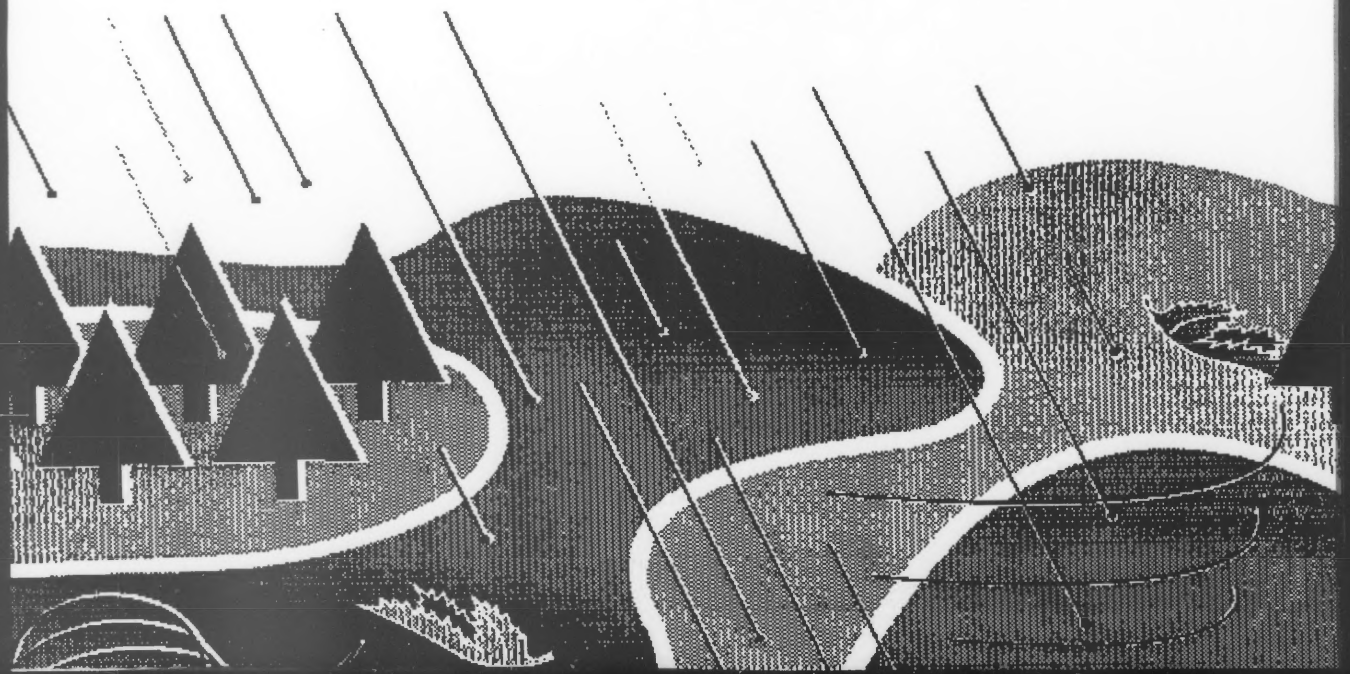
Unit 1: Understanding the Conservation Provisions explains the conservation provisions of the 1985 Food Security Act.

Unit 2: Determining the Need for a Conservation Plan explains how producers use aerial photos and soil maps to determine whether they have highly erodible fields and whether they are affected by the conservation provisions.

Unit 3: Examining the Erosion Processes explains both the water erosion and wind erosion processes.

Unit 4: Completing the Resource Inventory explains how to take an inventory of management practices, land use, and resource problems. Included are instructions on how to identify water and wind erosion problems.

Unit 5: Controlling Erosion and Related Problems helps producers select one or more alternative



strategies that reduce erosion to acceptable levels and control other resource problems.

Unit 6: Completing the Conservation Plan helps producers evaluate the economics of their alternative strategies, choose one strategy, write a conservation plan, and outline an implementation schedule.

The five slide-tape programs accompanying the manual provide an introduction to conservation planning, with descriptions of water and wind erosion.

"To satisfy the variety of approaches throughout the country, we divided the manual into what we call the 'Comprehensive' and 'Short' options," Farnsworth points out.

With the Comprehensive option, he explains, producers follow a detailed path through the planning process; and with the Short option, they take one or more short cuts.

For example, in the unit in which producers select strategies that control erosion, the comprehensive instructions explain how to estimate the rate of erosion with various management systems. With the Short option, producers do not have to estimate erosion. They simply refer to locally produced guide sheets, which list all of the management systems that reduce erosion to acceptable levels on certain soils.

Another goal, Herman points out, was to provide a manual that meets the needs of producers in both water erosion and wind erosion areas. To produce the wind erosion materials, Illinois relied on the assistance of specialists in Nebraska, Texas, Colorado, and at the national SCS office in Washington, D.C.

In addition to receiving assistance on wind erosion information, the materials went through an extensive review process that included representatives from 14 states. The project's funding agencies were the Soil Conservation Service, the Agriculture Stabilization and Conservation Service, the Cooperative Extension Service, Farmers Home Administration, the Federal Crop Insurance Corporation, and the Forest Service.

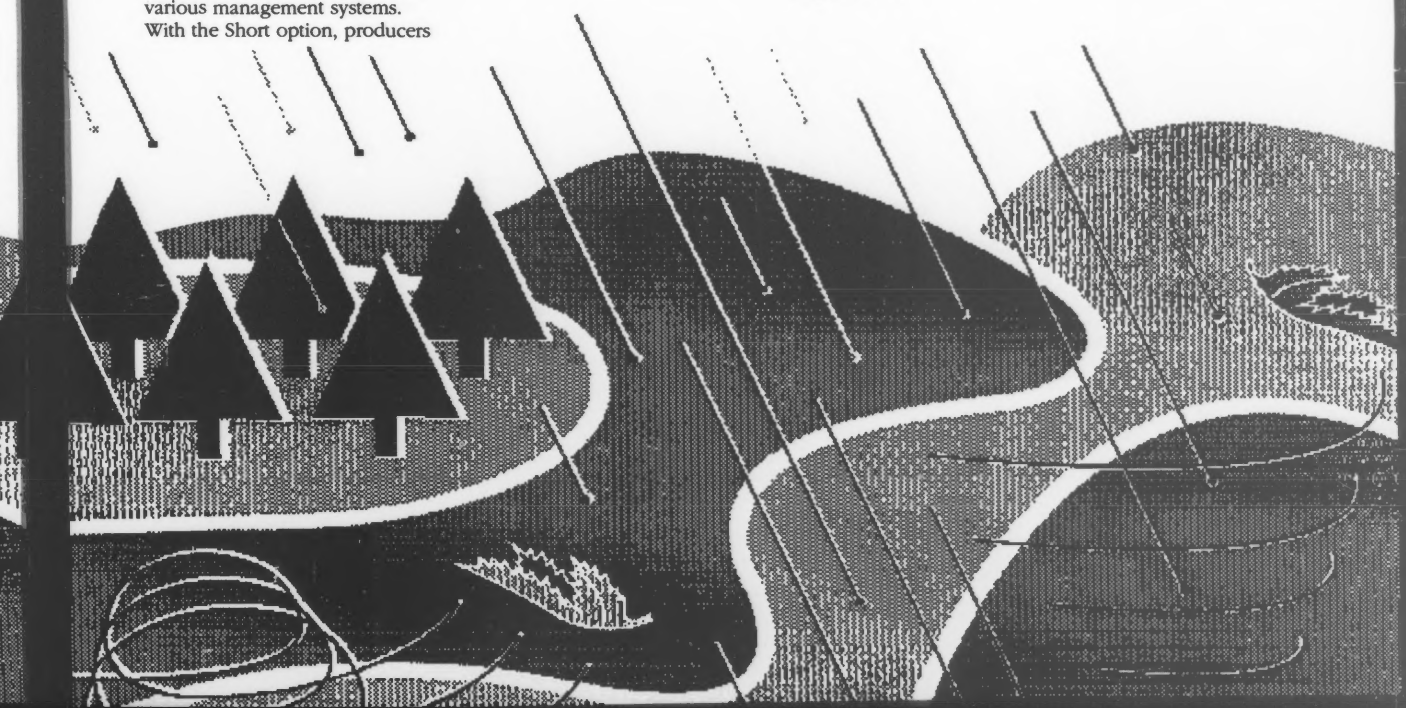
"When farmers take a major role in developing their own conservation plans, as they do with these materials, there is a greater chance they will be committed to the plan and to conservation in general," says Peter Bloome, assistant Extension director at the University of Illinois. "Also, they may decide to apply conservation practices to land that isn't affected by the Food Security Act but is still eroding excessively."

Achievement Through Cooperation

But do producers have the technical expertise to develop their own conservation plans in a workshop setting?

"Pilot workshops held in 1987 showed that, with assistance from experts, producers can handle the task," Farnsworth comments. " In addition, early tests of conservation planning in groups indicate that any farmer who needs or wants a plan can have one by 1990 if he or she attends group meetings in the county.

"The Conservation Systems Workshop shows the joint commitment of agencies and conservation groups. It demonstrates that we can cooperate in accomplishing a task mandated by Congress and supported by the public."



From Confrontation To Cooperation

Lora Minter
Extension Publications Writer,
University of Nevada-Reno

J. Wayne Burkhardt, Extension range management specialist and associate professor at the University of Nevada-Reno, awoke early to make the 205-mile drive that separated him from his 8 a.m. meeting.

Armed with a thermos of steaming black coffee and a down vest to chase away the morning chill, the College of Agriculture scientist headed his aging Ford pickup northward toward Susanville. He drove onto the two-lane highway that sliced through the millions of acres of federal land designated "northeastern California" along one side of the invisible state line, and "northwestern Nevada" along the other side.

Wayne Burkhardt, Extension range management specialist at the University of Nevada-Reno, indicates rangeland typical of the 2 million acres he and colleagues are improving by coordinated resource management planning (CRMP).

Burkhardt, and others converging on the meeting site at Cedarville, California, had a special interest in the more than 2 million acres of California's Modoc and Nevada's Washoe counties. Working together, they would hammer out resource management plans for this vast area of sagebrush rangeland.

An Alternative To Lawsuits

Burkhardt and his associates are involved in a "participatory management" experiment known as Coordinated Resource Management Planning (CRMP). Their goal is to foster better management of rangeland resources by bringing the people who are interested and affected into the planning and decisionmaking process.

"With CRMP," Burkhardt points out, "we get better land management plans because all interested land users and involved agencies work together. Conflict resolution is one of the group's major focuses."

And so, once every few months, CRMP members meet at Cedarville, California, to sit down and "participate" in range management at the grassroots level.

These people make up the Modoc/Washoe Steering Committee. The committee is one example of a Nevada CRMP group; however, it is also different from other CRMP groups in the state. This committee is one of only three, congressionally mandated, "experimental stewardship programs" undertaken jointly by the U.S. Forest Service and Bureau of Land Management (BLM) to provide incentives to livestock grazing permittees to improve the condition of public rangelands.

Because this stewardship committee has chosen to utilize CRMP stategies, Nevada's participatory management program has received national attention.

Why Coordinated Planning?

"During the 1970s, public interest in natural resources was at a peak," Burkhardt explains. "Special interest groups actively used political and legal processes to challenge significant natural resource management decisions.

"The once, almost mundane job of resource managers and users had evolved into a center-stage caldron of litigation," he remembers. "People believed that the local folks who were directly affected or interested should be involved in making the decisions."

It was at this point that Burkhardt and other Nevada Cooperative Extension range specialists began experimenting with new approaches to public land conflict resolution.

"Extension took a major lead in the effort of promoting CRMP," reports Burkhardt, "but we couldn't have gotten anything accomplished without the support of some of the federal agency leaders. Nevada was pushing for CRMP harder and faster than many states because there was so much controversy here."

How CRMP Works

A typical CRMP group functions as follows:

- The group is organized and the planning area is defined. Any organization or interested individual can be represented at meetings.

- The group defines the resource issues, problems, and opportunities. The concerns and objectives of all participants are clearly recognized and planning begins.

- Management plans are forged in an on-the-ground process of compromise and consensus.

• Plans are implemented and monitored on a periodic basis, and, if necessary, reevaluated and revised.

Memorandum Of Understanding
In 1980, five federal and five state agencies signed a "Memorandum of Understanding" agreeing to participate in and support local requests for coordinated plans

"At the present time, some form of participatory land use planning is being used to resolve rangeland conflicts throughout Nevada," Burkhardt says, "and similiar approaches are being tried in all Western states." The use of CRMP, however, is most widespread in Nevada.

"Conflict resolution is one of the group's major focuses."

The concepts used in CRMP are also gaining wider acceptance in the settlement of disputes over issues involving wetlands protection, airport expansion, park management, off-road vehicle use, and sewer construction.

Beginnings
The meeting of the Modoc/Washoe Stewardship Committee began early at the Cedarville BLM area office.

The people who gathered were from all walks of life. A rancher volleyed questions from a wild horse enthusiast. A representative from the Audubon Society joked with BLM and Forest Service representatives; and a county supervisor swapped stories with a California Fish and Game representative.

These people were known to have strong beliefs on how range and natural resources should be used, and their beliefs are not always in line with one another's convictions. But, they would that day, as they had for the past 8 years, work together to solve mutual problems on Nevada and California rangeland.

The group was formed after the BLM issued an Environmental Impact Statement regarding the Modoc/Washoe area. Of approximately 70 grazing decisions that were a part of the statement, virtually all were appealed.

Accomplishments
Since CRMP has been in effect, all of the Environmental Impact Statement decisions have been reevaluated and new allotment management plans designed and implemented. As a result, only one appeal action remains and the CRMP committee is still hoping to resolve the issue out of court and bring the entire 2 million acres under allotment management plans.

Other committee accomplishments include:

• Acreage, used for intensive grazing management to provide periodic growing season deferment from livestock, expanded from 669,400 acres in 1980 to 1,123,000 in 1985.

• Land treatments on 23,000 acres resulted in immediate range improvement. Treated areas went from sagebrush-dominated communities to areas with a good mixture of grasses and shrubs.

• Wildlife in the area is on the increase. Antelope numbers have risen from 2,700 to 3,175; deer from 7,100 to 8,000; and bighorn sheep from 14 to 41.

The committee has also achieved: recommendations by technical review teams on seven wilderness study areas; designation of an area of critical environmental concern; and, development of an experimental, wild horse management process to determine the best methods for producing highly adoptable animals. Recommendations have been made for wilderness and off-highway vehicle use areas. Several allotment management plans been put into effect.

Jeannie Schadler, a rancher and committee member, notes, "Our goal isn't to create one showcase, but to put 2 million acres under intensive management for resources. We want to make CRMP a household word and make people realize that it costs to manage land."

To quote the stewardship's most recent report to Congress: "The most significant result of the program was a change in attitude from confrontation to cooperation in rangeland management as a result of more intensive communication and coordination."

That cooperation is evidenced in the dedication of many CRMP members, just like Extension's Burkhardt, who devote their time and energy to making the process work.

Extracted from an article in AGFORUM, a quarterly newsletter published by the Agricultural Information Office, College of Agriculture, University of Nevada-Reno.

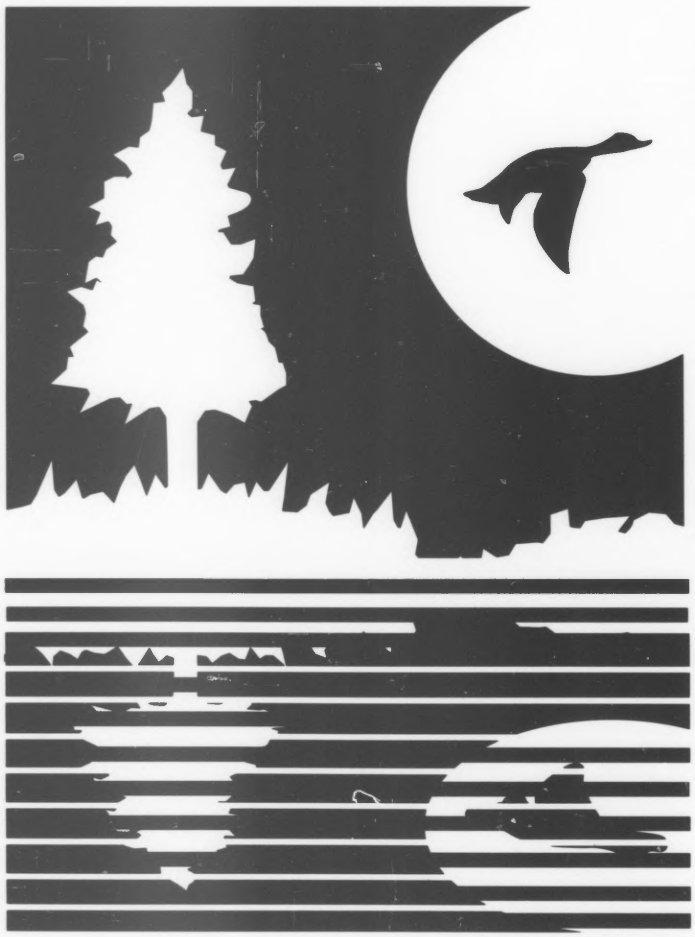
National Initiative:

Conservation and Management Of Nature Resources

Situation

Profitability of rural enterprises and revitalization of rural communities depend on natural resource–based crops, products, and services. Enlightened management and use of natural resources are also vital in efforts to improve environmental quality and the health and well-being of famlies and communities.

The Cooperative Extension System will strengthen its commitment to conserving and managing natural resources in its educational programs. The need to use natural resources to benefit people will be united with the need to conserve and protect these same resources for future generations. Profitability will be addressed in both dollar values and non-market benefits that reflect the goals and values of landowners and communities. These include protecting wildlife, preserving aesthetic beauty, and assuring clean air and clean water.



Critical Issues :

Extension efforts in conserving and managing natural resources will focus on three critical issues.

ISSUE 1: Sustaining a Productive Natural Resource Base

Underlying the quality of life and economic viability of our communities and our Nation is a sustainable base of natural resources. Our needs for food, clothing, shelter, economic opportunity, recreation, aesthetic surroundings, and renewal of spirit are rooted in these resources. We are all shareholders along with future generations. If these natural resources are spoiled or lost, we are diminished.

Natural systems are highly interdependent. Costs and benefits of management decisions are distributed between resource owners and their neighbors and between present and future generations. Individuals and communities have responsibilities to make choices that not only provide immediate personal benefits, but are also in the best long-term interests of society. At stake are the biological diversity found in natural systems and the long-term sustained productivity of the Nation's forests, grazing lands, wetlands, and croplands, as well as air and water quality

Owners and managers of natural resource–based enterprises face an increasingly complex and competitive operating environment. They need greater knowledge of biological systems as well as more sophisticated technical and financial skills.

Extension Goals and Objectives:

- Sustain and enhance the quality, abundance, and diversity of the resource base.

- Increase the capacity of this base to produce multiple goods and services that diversify and strengthen rural economies.

- Improve soil and water quality.

ISSUE 2: Marketing Natural Resource Products and Services

Demand for products of natural resources continues to increase. With improved management, the natural resource base is capable of contributing more to the economy and to the well-being of individuals and communities than it does now. There are opportunities to expand markets for existing products, develop new markets, create new products, and provide new alternative enterprises through natural resources.

Rural economies and communities, more than those of urban areas, depend directly on natural resources. In rural areas, opportunities exist to create new jobs and markets in value-added activities related to traditional timber, crop, and livestock products, as well as in recreation and other enterprises based on wildlife, fisheries, and aesthetics.

Extension Goal and Objective:

• Increase income–generating opportunities and profit margins from the natural resource components of production enterprises to landowners, managers, and communities through expanded marketing education programs.

ISSUE 3: Natural Resources Public Policy Education

The many contributions of natural resources give rise to competing interests. Future management decisions must involve choices that meet societal as well as personal goals. Conflict resolution requires the pursuit and free flow of objective knowledge. It also requires informed decisionmaking at all levels of policy formulation and implementation.

Public interest in issues, such as land use, soil erosion, sedimentation, pesticide use, water quality, and rare and endangered species, is resulting in policy initiatives at local, state, and national levels. Public policy has become increasingly focused on regulating in the public interest—management decisions on forestland, grazing lands, wildlife habitat, cropping systems, and water use.

There are no simple answers to the question of how to best manage resources for the greater public good. Improved processes for formulating and implementing policy are essential. Extension will strengthen and increase its efforts in policy education. The key is to form policies *with* people rather than *for* people.

Extension Goals and Objectives:

• Develop and provide objective information to ensure that policies are fair, coherent, and dynamic.

• Ensure that responses to policies are positive.

• Provide for early definition of emerging policy questions.

• Evaluate impacts of existing and proposed policies.

Seeing Things Differently

Fred Deneke
National Program Leader,
Forest Land Management,
Extension Service, USDA
and
Peter D. Bloome
Assistant Director, Agriculture, Natural Resources, and CRD,
Cooperative Extension Service,
University of Illinois, Urbana

We have a favorite saying from an unknown source: "You can't *do* things differently until you *see* things differently!"

A review of the editorial comments in this issue by Neil Sampson, Bob Reber, and Deputy Secretary Peter Myers suggests that Extension must "*see* things differently and *do* things differently!" The emphasis of the past on production and quantity must give way in the future to an emphasis on quality.

Many events of the past few years reenforce this message: the Renewable Resources Extension Act of 1978, the Conservation Provisions of the 1985 Food Security Act, the amendments to the Clean Water and Endangered Species legislation, and broad-based, growing interest in low-input or sustainable agricultural systems.

Untapped Potential

In our view, the Cooperative Extension System has the greatest untapped potential of any organization in existence today to help owners and managers wisely conserve precious natural resources. At the same time, it has the potential to expand the economic opportunities associated with those resources: to instill in people, beginning with youth, a conservation ethic and the insight that with ownership rights come stewardship responsibilities. Stewardship can represent an ultimate act of charity when it meets the needs of the generations that follow. We must teach people that resource use and conservation can go together in perpetuity.

Can we *see* things differently so that we can *do* things differently? The selection of Conserving and Managing Natural Resources as a National Initiative by the Cooperative Extension System was, I believe, an important first step in that direction.

The second step has been the development of an Initiative Task Force Report that spells out Extension goals, objectives, and actions specific to conserving and managing natural resources. The previous article is a shortened form of that Task Force Report. It contains innovative approaches to youth education efforts. We strongly encourage you to obtain a copy of the full-length, original report and incorporate the suggestions into your educational programs.

A third step will be the "Natural Resources For The 21st Century" conference to be held this November in Washington, D.C. (See article on page 17 of this issue.)

The step that remains will be the most difficult: To implement the National Initiative nationwide.

Commitment At All Levels

The national focus on Natural Resources poses a set of challenges for Extension. The commitment to conserving and managing natural resources and a conservation ethic must permeate all program areas and all levels. In fact, a good measure of the success of this initiative will be how well the conservation principles contained in it are incorporated into other Extension National Initiatives. This is particularly true of the Competitiveness and Profitability, Alternative Agricultural Opportunities, Rural Revitalization, and Water Quality initiatives.

We must begin to address hard questions regarding resource interdependence and equity.

More specifically, we will need to take a closer look at our existing advisory mechanisms at national, state, and county levels to ensure that natural resource interests are represented. As a basis for future program development and staffing we will need to cooperate with other agencies to compile state and county data describing natural resources and the characteristics of resource owners, including their goals and objectives.

States and counties will need to examine programming and staffing levels to see if they are consistent with the needs and opportunities of their natural resource base.

Special Skills Necessary

This may also mean recruiting staff with special knowledge and skills in biology, natural resource management, policy, and economic development, especially in counties with an abundant natural resource base. It will also mean seeking out opportunities to deliver natural resource messages and programs to or through such other audiences as women's groups, teachers, retirees, and volunteers.

There will be a need to recruit and assign interdisciplinary teams with cross-training in natural resource topics. Also, there will be a need to train existing staff in integrated natural resource management and ecological principles.

More attention must be focused on including natural resource products more regularly in USDA and state commodity reporting systems.

This initiative provides us with an opportunity to re-energize our system and make a vital contribution to the future. We must make stewardship of the land and its resources an integral part of our personal and organizational ethic and educational programs. The next step for all of us in Extension is to move forward and *see* and *do* things differently!

Find The Forest Via Video

Bud Blumenstock
Extension Forestry Specialist,
University of Maine, Orono

"A chicken in every pot." (1932)
"A television in every home." (1975)
"A videocassette player in every living room." (1990)

During the depths of the Great Depression, President Franklin D. Roosevelt coined the phrase, "A chicken in every pot," to dispel despair among Americans fearful of going hungry.

During the 1970s, the prophecy of a "television in every home" sounded like an extravagant claim. Now television is accepted as a common medium for information and entertainment.

By 1990, forecasters predict that every American home will be equipped to both record and play videocassettes. Extension is responding to these changes in the way we deliver educational programs. This article describes how Maine Cooperative Extension Service got involved.

During a tour of forest lands in Northern Maine in 1980, several participants expressed an interest in forestry practices (or lack thereof) on privately owned forest lands in Maine and the United States. Contrary to popular notions, much of the United States private forest (about 60 percent of the total) is owned by individuals in relatively small tracts that average about 43 acres in size.

Forest landowners (nearly 8 million of them) represent a cross section of occupations and interests. However, a large percentage of all woodlot owners have an interest, perhaps latent, in forest conservation and natural resources. This group represents an educational class that calls for action. In Maine, one of our responses to this need started with a video program.

In 1982, Maine Public Broadcasting Network, in cooperation with Maine Extension, produced a 10-part television series, "Yankee Woodlot," for distribution via public broadcasting stations in Maine, and in other parts of New England. The series was rebroadcast in Eastern Canada, Alaska, and New York with supplemental home-learning material provided to requesting viewers.

The "Yankee Woodlot" series increased forest owners' awareness that their lands had potential yet untapped. This led to increased activity for Maine Extension in the area of forestry and natural resources. Five Yankee Woodlot Demonstration Areas now operate across the state, along with a week-long intensive training course for landowners, an emerging woodlot volunteer program. Results include an increased interest in the forest by both existing and new Extension students.

Series: Great American Woodlots
This is a 13-part series that profiles forest owners across the United States. Additionally, it includes some how-to-do-it tips on a wide range of subjects, from chain saws to maple syrup to wildlife. Each program closes with a statement by a national leader on an important matter of forest policy.

Both the video productions were directed by James Bisson of the Maine Public Broadcasting Network. His professional skills provided the crucial elements that give the series a broad appeal. His selection of original music in our first series, led to runner-up recognition in the New England "Emmy" awards for that category.

The message is clear—quality television is more than a "do-it-yourself" enterprise.

A highlight of these video productions has been the extraordinary cooperation received from many forestry segments, private and public, in significantly tangible and intangible ways. The list of helpers is a long one and includes: the American Forestry Association, Project Learning Tree of the American Forest Council, the Harvard Forest at Harvard University, the Maine State Planning Office, the Minnesota Forestry Association, the National Wildlife Federation, and the U.S. Forest Service.

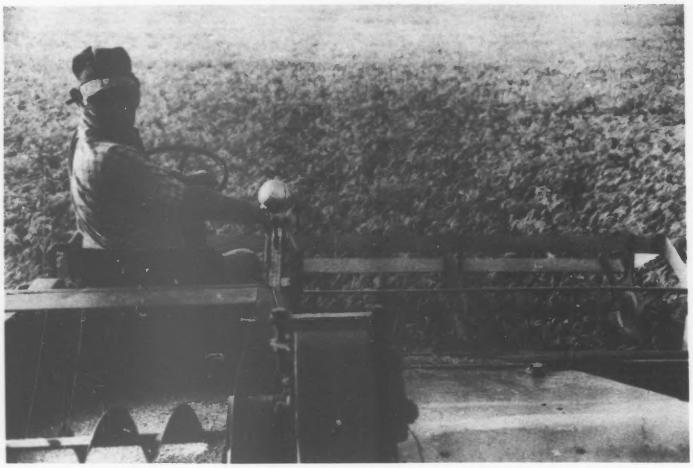
Other help came in the form of television footage provided by International Paper Company, the Tilton Equipment Company, Western Maine Nursery, and the Weyerhaeuser Company, and many state Extension Services that were working with video. Financial underwriting came from the U.S. Fish and Wildlife Service, the U.S. Forest Service, Great Northern Nekoosa Corporation, Ruffed Grouse Society, Society of American Foresters, and the Northeastern Loggers Association.

Widely Viewed Series
The "Great American Woodlots" series has played on Public Television stations in 38 states, with an estimated viewing audience of a half million people. The series was also shown on cable television networks and in many homes on videocasette recorders. There is great demand for the series. Videocassettes sell at cost, and five sets have been placed in the Interlibrary Loan System.

Extension has placed Videocassettes of "Great American Woodlots" and "Yankee Woodlot" in their offices in Maine and other states.

As a television critic suggested many years ago, "the medium is the message." It is also a medium for the Extension message nationwide. Extension Services across the country are actively using video technology to deliver educational messages. This is a description of just one effort. It resulted from cooperation among many to provide Extension education about natural resources, forests, and woodlots.

Getting The Word Out



John Hickman
Extension Specialist, Soil and Water Conservation, Kansas State University,Manhattan

Kansas Extension, working with SCS and ASCS personnel, contacted 23,000 people at 260 meetings to explain aspects of the 1985 Food Security Act and the Conservation Reserve Program (CRP). This was part of a massive educational campaign requesting producers to voluntarily stop growing crops on erodible cropland and, instead, grow vegetative cover crops.

The Food Security Act of 1985 became law on December 23, 1985, giving birth to the Conservation Reserve Program (CRP).

Extension professionals in agronomy and soil conservation recognized immediately that Extension would be facing a massive educational campaign. While not particularly a new concept in American agriculture, CRP differed from the Soil Bank of the fifties and sixties. Besides, many producers and agency professionals had forgotten the old Soil Bank and similar land-idling efforts. For most, CRP was a new ballgame.

CRP was to be voluntary. The U.S. Department of Agriculture (USDA) would ask producers to stop growing crops on highly erodible cropland and create on that land, instead, vegetative cover crops of a permanent nature. USDA would provide rental payments for the 10-year duration of the program and pay half the cost of establishing the covers.

Our task was and is to explain that reducing crop production on poor land would have multiple beneficial effects, not the least of which would be reduced soil erosion. We are to provide basic program information: eligibility requirements, methods for achieving CRP goals, and materials to help them make appropriate bid decisions.

One obvious key to the success of these major efforts would be excellent cooperation and coordination among USDA, state, and local agencies and organizations.

The First CRP Signup

USDA announced the first signup 70 days after President Reagan signed the 1985 Farm Bill. In Kansas, we formed an interagency and interdisciplinary team to provide immediate, decisive action.

The Kansas CRP team spearheaded action groups of people from Kansas State University, the Agricultural Stabilization and Conservation Service (ASCS), and the Soil Conservation Service (SCS), including the county level. At the state level, we began to provide county personnel with the latest detailed information, decisionmaking aides, seeding specifications, and news releases.

We tried various means of transmitting information. We used the Kansas Telenet system (55 broadcast locations) to train 300 county Extension, SCS, ASCS, and other professionals. Another Telenet conference attracted over 1,800 farmers. We conducted the conferences about a month ahead of the signup.

County Extension agents, working closely with SCS and ASCS personnel, conducted 62 CRP meetings for 2,720 people. Extension and other agency personnel met with 23,000 people at 260 meetings to explain the multiple aspects of the 1985 Food Security Act. The Extension agents provided over 100 radio programs, served as members of county conservation review groups, and gave the public untold thousands of handouts, news releases, bulletins, worksheets, and consultations.

Choosing An Appropriate Bid

We heard this question often: "At what price could I afford to idle CRP acreage for a 10-year period?" USDA had decided to base acceptance of a CRP application on a competitive bid process. That meant applicants would bid against one another to participate in the program. A low bid could mean money lost; a high bid could mean exclusion from the program. County Extension agents worked carefully with landowners to help them arrive at an appropriate bid.

"Some of our producers had no idea where to start in developing bids," recalls Kurt Roe, Extension director and agricultural agent, Ellsworth County, Kansas. "They tended to think of short-term costs. But there would be labor, fertilizer, and other costs in the future."

Roe says he "used a worksheet from our Kansas State Extension ag economists to help my producers make these key decisions. I plugged in some of my county figures and the farmers could then go home and fill in the blanks. I did not tell them what to bid—that had to be a personal decision."

Was this assistance helpful? "I think it was pretty remarkable that Ellsworth County had 33 accepted contracts out of 44 submitted bids for the first

signup," says Roe. "That was the best record in the state. It was the goal of Extension, SCS, and ASCS in this county to get the most acres possible in the program. We accomplished that because we worked together."

As Kansas producers have gained experience working with the CRP, the bid acceptance rate has improved. In the first signup, the bid acceptance rate was only 30 percent. By the fifth signup, the acceptance rate had improved to 98 percent. We believe this occurred because the maximum "pool" rental limits remained level during the last five signups.

Most producers wanting land accepted into the CRP are bidding within $1 of the maximum pool limit used during previous signups. This is true even without guarantees that future rates will remain the same. These producers now wonder if the current going rate is economically sound for each individual situation.

Show-N-Tell Tours

Over 90 percent of the Kansas CRP acreage will be in native grass. Compared with pre-CRP years, this share represents a tremendous increase in such plantings. As expected, producers have flooded Extension specialists and county agents with questions about managing their cover crops over the coming decade.

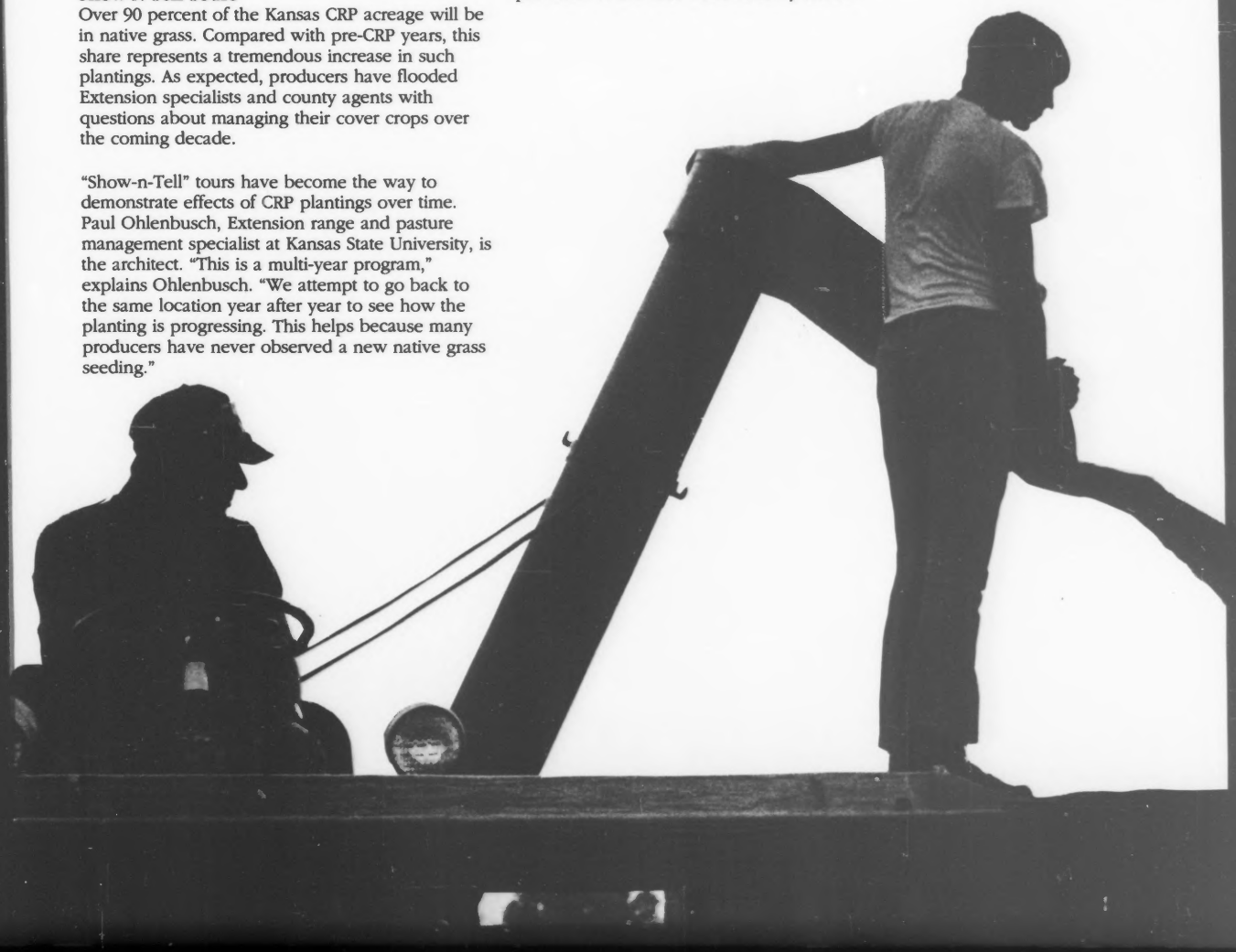
"Show-n-Tell" tours have become the way to demonstrate effects of CRP plantings over time. Paul Ohlenbusch, Extension range and pasture management specialist at Kansas State University, is the architect. "This is a multi-year program," explains Ohlenbusch. "We attempt to go back to the same location year after year to see how the planting is progressing. This helps because many producers have never observed a new native grass seeding."

A typical tour would include observation of a 1988 cover crop as well as grass planted in 1988, 1987, and 1986.

"It's important to have problem plantings as well as successes included in the tours," advises Ohlenbusch. "We often learn more about planting native grass by observing people's problems than by touring successful plantings. CRP participants must treat their CRP acres as they would their crop acres, giving them the same careful planning and careful management."

The CRP Success In Kansas

As of the sixth signup, Kansans had enrolled over 2.3 million acres into the program. Some of the program benefits include annual rental payments to producers of $120 million, a cropland base reduction of 1.65 million acres, and an annual savings of 38 million tons of soil. The erosion savings alone have reduced the annual cropland erosion rate in Kansas by 23 percent. The CRP will go a long way toward implementing the conservation compliance provision of the 1985 Food Security Act.



Profiles To Target Clientele

Dave Donovan
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Small Business Energy
Efficiency Program,
Cornell University,
Ithaca, New York

Success for many New York small businesses that rely on natural resources is dependent on their becoming competitive in today's rapidly changing economic climate. Small business managers face a variety of difficulties in their quest to remain competitive. Often they don't have the technological or managerial skills necessary to make informed decisions.

Various programs have been developed and implemented through the Cooperative Extension System to reduce deficiencies of small business managers. But it's difficult to design a program to meet the needs of all small businesses. The characteristics of a convenience store differ from those of a tourism or natural resource-related industry. A necessary first step is to identify the needs and characteristics of an industry and the individuals who comprise that industry. Success or failure depends on developing an accurate profile.

Energy Efficiency Program
Cornell University's Department of Natural Resources (DNR) Extension Program has identified several small businesses with potential for helping to revitalize rural New York. The operating environment of these small businesses is directly related to the uncertain energy cost of the 1980s.

The New York State Energy Office (NYSEO) and Cornell Cooperative Extension implemented the Small Business Energy Efficiency Program (SBEEP) to teach small businesses how to evaluate and manage their energy consumption. Funded by NYSEO, the SBEEP tries to improve the economic well-being of small businesses and not-for-profit organizations by reducing energy costs. Through free on-site energy surveys, data are collected on combustion efficiency of furnaces, hot water usage, lighting levels and requirements, and other energy-consuming equipment. A report listing energy consumption patterns, various energy efficiency recommendations, and payback periods is provided to the manager of the small business and not-for-profit organization.

Profiling Clientele for the SBEEP
An educational program designed for all small businesses in New York must be adaptable to address the wide range of issues of such a diverse audience. Our first step in modifying this program for a particular industry is development of a profile of the industry and its various businesses in order to better understand target clientele.

This includes identifying demographic variables about the industry and the individuals who comprise it and obtaining answers to such questions as:

- How can one identify the manager of the business?

- What is the manager's level of education and management ability?

- Where does the manager learn about industry advances?

- Who supports the industry through services?

- Are there any government regulating bodies involved?

- How complete is the government/association/manager/consumer/service networking system?

The New York Campground Industry
Implementation of a joint SBEEP-DNR profiling process began in October 1987 with site visits of campgrounds near Ithaca. These site visits produced information on the types of energy–consuming equipment campgrounds typically use, government regulations, consumer characteristics, service groups, internal communications, the state campground association, generalizations of demographic variables, and management styles.

The site visits were followed by contact with the Executive Director of the Campground Owners of New York (CONY) Association. These meetings gave us an opportunity to estimate the need and potential of the SBEEP in the campground industry, discuss other industry characteristics, and identify avenues within the industry to promote and advertise the SBEEP to the managers. We received an invitation to verify industry needs and characteristics and to present the SBEEP to the campground industry membership at the fall CONY meeting in November 1987.

Results and Expectations
We finished the profiling process by the 1987 fall meeting of the CONY organization. Our profile confirmed industry's needs, legitimized the SBEEP, and established the importance of energy savings to the industry.

Training
In March 1988, we conducted technician training to prepare for the approaching camping season. The profiling process helped us develop information for the energy technicians on sub-metering technology. It emphasized what type of energy consumption data was necessary to collect for the campground industry.

SBEEP's success for the campground industry is enhanced by profiling. Potential energy savings from implementing SBEEP is estimated at over $1,000 annual savings with a payback period of less than 18 months. These savings are equivalent to the profit a business would obtain by starting a new product line or service that grossed over $30,000 per year.

The benefits of profiling and the SBEEP offer natural resource-related industries a real future and role in the revitalization of New York's rural economy.

Hawaii Focuses On Forestry

Most mainland Americans think of Hawaii as a place of beautiful beaches, palm trees, and pineapple fields. However, not many people are aware that forests cover nearly half (48 percent) of the land in Hawaii, and that almost a million acres are productive enough to be classified as commercial forest.

The uses of forest land and its products vary widely in Hawaii. State lands are largely in watershed preserves; other state and private forests supply sawlogs, fuelwood, and craftwood to local industries. For example, in 1986, tropical hardwood chips produced over 16 percent of the electricity used on "the big island." Minor forest products are an important part of Hawaiian forestry and culture, and include tree ferns, kukui nuts, and, surprisingly, Christmas trees.

The University of Hawaii, like most land-grant institutions, has focused its Extension programs on the traditional areas of agriculture and home economics. Recently, the Renewable Resources Extension Act has allowed the university to expand its programming to include some emphasis on forestry and related resources. These efforts have been modest, but important, to a state with natural resources that are truly unique and vital to its residents.

Training Program

Extension at the University of Hawaii has no forestry agent or specialist on staff. However, Extension is a potentially important source of forestry information and referrals.

In the summer of 1987, Extension organized a 2-day training program for nearly 20 county agents, and other staff, to improve their understanding of local forestry principles and options. Instructors included foresters with the Hawaii Division of Forestry and Wildlife (HDFW), the Pacific Islands foresters of the U.S. Forest Service, and other local forestry experts. Extension staff at the University of Hawaii invited these instructors with the primary objective of identifying and developing a network of key forestry contacts.

Closely coupled with staff training was the development of a forestry resource notebook that can be used by Extension staff to respond to landowner needs and inquiries. The notebook is tied in to the topics in the training program. As an aid to decisionmaking, one section describes a number of forest management alternatives and lists major advantages and disadvantages of each option, important questions for landowners, and references and sources of technical support.

Brochure For Landowners

Because many landowners in Hawaii are unaware of the forestry options and assistance available to them, a brochure was developed to briefly describe these options and to list the addresses and phone numbers of Extension at the University of Hawaii and the HDFW offices. The options included in the brochure match those covered in the staff training and forestry resource notebook.

Cooperation

Cooperation between Extension at the University of Hawaii and the HDFW is essential in improving forest management on private lands in Hawaii. The HDFW offers vital technical support—such as management plans, cost-share program assistance, and tree seedlings—while Extension has an established rapport with landowners. HDFW staff have been kept well informed about recent forestry activities by Extension and the training and brochure previously described enlisted their direct cooperation and support.

Future Focus

Private landowners in Hawaii, like their mainland counterparts, have very diverse interests and needs related to forestry.

If energy prices increase significantly in the future there will be renewed interest in bioenergy plantations. On the best soils, forest biomass production in Hawaii is among the highest in the world. Better soils are now widely planted to sugarcane, but this crop is becoming less and less competitive in the world market. For this reason, cane growers are already seeking alternative land uses.

However, with limited resources for Extension forestry expected for the near future, programming must focus on a few high priority areas where needs and opportunities currently seem greatest: windbreaks, hardwood culture, Christmas trees, and forestry economics.

Hawaiian farm operator checks tropical forest plant of the taro family from which poi is made. Forests productive enough to be classified as commercial cover nearly half of Hawaii. Extension at the University of Hawaii is expanding its programming to emphasize forestry and related resources.

Paul W. Adams
Extension Forest Watershed Specialist,
Oregon State University, Corvallis

Pine Straw Means Profit

Dave Caldwell
Extension Writer,
Department of Agricultural Communications,
North Carolina State University, Raleigh

Opposite: Pine straw, sold for use in landscaping as a decorative mulch, has become a lucrative agricultural enterprise in North Carolina. Here, workers bale the pine straw prior to sale. Above: workers collect pine straw in a stand of longleaf pine.

Terry Bryant, a North Carolina farmer from Moore County, walks through a stand of North Carolina longleaf pine trees, kicking at a seemingly worthless layer of pine needles covering the forest floor. Bryant makes his living collecting and selling this forest floor debris. "This is an industry in its infancy," he says.

Bryant and other North Carolina farmers have found that pine straw, as the pine needles are known, can be a valuable crop. "Sales of North Carolina pine straw have risen rapidly in recent years," says Rick Hamilton, Extension forestry specialist at North Carolina State University. Hamilton estimates that the state's farmers and landowners earn from $15 to $20 million each year from the sale of pine straw.

Garden and hardware stores sell the needles, which are used in landscaping as a decorative ground cover and mulch, for anywhere from $4.50 to $5 per bale. For some farmers pine straw represents a part-time supplemental farming activity. But others, like Terry Bryant, make a living collecting and selling it.

Unconventional Farming

As Bryant's situation illustrates, collecting pine straw can be an unconventional farming activity. A former tobacco farmer, Bryant lives in Moore County. Yet he collects pine straw on roughly 25,000 acres in Pender and Brunswick Counties located on the North Carolina coast over 120 miles from inland Moore County.

Bryant does not own any of the land from which he makes his living. He has agreements with landowners under which he pays the landowner 35 to 50 cents per bale for the pine straw he takes off the land. The price depends on the quality of the needles.

Bryant sells about 90,000 bales of pine straw a year at wholesale prices ranging from $3.40 to $3.60 per bale. A good stand of longleaf pine, Hamilton says, will yield from 70 to 100 bales of pine straw per year.

Sealed bids are usually submitted for pine straw collection on public land. Bids have ranged as high as $225 per acre for a 6-month raking period, reports Mark Megalos, Extension area specialized assistant agent who concentrates on forest resources.

Pine straw theft has become a problem is some areas. "In an effort to combat such thefts," Megalos says, "several counties have adopted ordinances requiring companies that buy and bale pine straw to keep records detailing from whom they purchase needles."

Longleaf pine, which has needles longer than the more prevalent loblolly pine and thus is easier to bale, has proved the best straw producer. Extension specialists like Hamilton and Megalos are excited about the possibility pine straw holds for providing an annual income from timber land.

Some Drawbacks

Pine straw collection is labor intensive. In stands where the trees are thick, hand raking is the only way to get straw out. Pine straw that is free of leaves, limbs, and other debris is the most salable and valuable. It may be necessary, using herbicides or by burning, to remove undergrowth.

"A thriving pine straw industry might shift the preference of timber growers from loblolly to longleaf," Hamilton believes. Loblolly grows to timber size in 30 to 40 years versus 60 to 70 years for the same growth from longleaf pine.

Because it has been preferred as as timber producer, more research has been done on loblolly than on longleaf pine. "This is beginning to change," Hamilton points out. "Demonstrations are planned from which specialists hope to learn more efficient ways to grow longleaf pine."

Proving A Valuable Commodity

Vast stands of longleaf pine once stretched across North Carolina but they dwindled in the face of development and loblolly preference. The emergence of pine straw as a valuable commodity is proving an economic boon in North Carolina, especially in the eastern and south central areas of the state. In addition, farmers are placing greater emphasis on proper management and conservation of the natural resource that provides the commodity—the longleaf pine.

Strategies For Minnesota's Future

A. Scott Reed
Extension Specialist and Acting Program Leader,
Natural Resources,
Cloquet Forestry Center,
University of Minnesota

Opposite: Future issues in the state's economic development involve increased production of timber and forest products. Above: Minnesota's lakes and rivers attract over $2 billion tourist dollars annually.

For Minnesota, as in many states, soil, water, forests, fish, and wildlife are key ingredients for economic prosperity and quality of life. To delineate the mission and program priorities that will guide program development in natural resources over the next decade, Extension at Minnesota has developed a series of strategic plans that focus organizational energies on four central issues: economic development, environment and natural resources, human development, and community leadership.

Economic benefits from natural resources means new products and industries, more jobs, and stable local economies. But consumptive use of our resource base can eliminate options for future generations. Minnesota's approach seeks to increase the economic return from natural resource industries, while balancing these gains with long-term management efforts so that people will continue to enjoy these resources.

Big Resources Mean Big Busines

Minnesota soil provides the foundation for the annual $3.8 billion forest-based income and $7 billion farm income. About one-third of the state's residents work in jobs related to these industries.

Nearly 12,000 lakes and 93,000 miles of rivers and streams help attract over $2 billion tourist dollars annually. Half of all state residents have fishing licenses. One out of every six Minnesotans is a boat owner—the nation's highest ratio. Recreation and tourism depend heavily on Lake Superior, the largest fresh-water body in the world, and the Boundary Waters Canoe Area Wilderness.

Future issues in economic development involve increased production of timber and forest products, new uses of water resources, and expanded regional, national, and international markets for natural resource products. Future conservation and environmental concerns involve water quality, waste management, continuing education of professionals and private owners in forest management, and understanding of natural resource management by the general public.

Goals And Strategies

Major goals for Minnesota Extension in natural resources during the next 10 years are:

1. Provide programs that build a productive, profitable natural resource base. These programs will help develop new products and industries, create jobs, and contribute to a stable economic base for rural and urban communities.

2. Promote management of our natural resources to address environmental concerns. This means having a sustainable harvest of natural resource products while preserving our air, water, and soil quality for future generations.

3. Increase people's understanding and enjoyment of natural resources. Minnesota Extension seeks to promote responsible use of natural resources as a major contributor to "quality of life."

Strategies for helping to achieve these goals are:

- Anticipate critical problems in the natural resource area by monitoring trends and listening carefully to community leaders, business people, researchers, and consumers.

- Use all available university research and faculty to respond quickly to the critical problems. Encourage county-based faculty to specialize to provide depth in programming. Promote research in areas where it is required.

- Use information technology—videotapes, computer software, and teleconferences—to make programs available to a wider audience.

• Multiply the efforts of Extension staff by selecting and training volunteers.

• Strengthen relationships with natural resource agencies and industries by sharing information, sponsoring joint programs, and eliminating duplication.

Scenarios For The Next Decade
Minnesota Extension is taking a new look at its educational programs in natural resources. What are the future accomplishments that will be achieved as a result of this re-evaluation? Here are three scenarios—hypothetical projections into the future—which describe clientele, issues, and impacts a decade from today.

Time: 1999
Place: Northern Minnesota

Extension's application of research will help create new products and industries based on natural resources.

New Fiber Fuel Sources
Most schools and businesses will save on heating costs by using fiber fuel. Wood is one familiar source, but two new items—peat from Minnesota bogs and agricultural leftovers such as cornstalks—will prove to be economical choices. Significant economic contributions from heretofore unused natural resources will begin to make their mark.

Wood Ash For Fertilizer
Extension research will find a new use for the ash which remains after burning wood for fuel: it makes excellent fertilizer. A former waste product will provide Minnesotans with jobs and income.

Databanks For New Markets
Information from Extension databanks will be critical in developing new national and international markets for these and other products.

Extension natural resources strategies will make a difference in Minnesota's economy.

Time: 1999
Place: Any Minnesota Home

Consumers will be convinced that Extension Natural Resources specialists provide reliable, objective information and that Extension provides invaluable help in analyzing and applying that information.

Trained Volunteers
Whether the problem concerns a diseased tree or moisture problems in the home, a trained Extension volunteer, after making a home visit and consulting a portable computer, will find answers and treatments that will provide successful solutions.

Communities will be able to make informed decisions on such problems as waste management

or water quality after Extension specialists have analyzed the problems in light of special community needs.

Time: 1999
Place: A Minnesota Farm

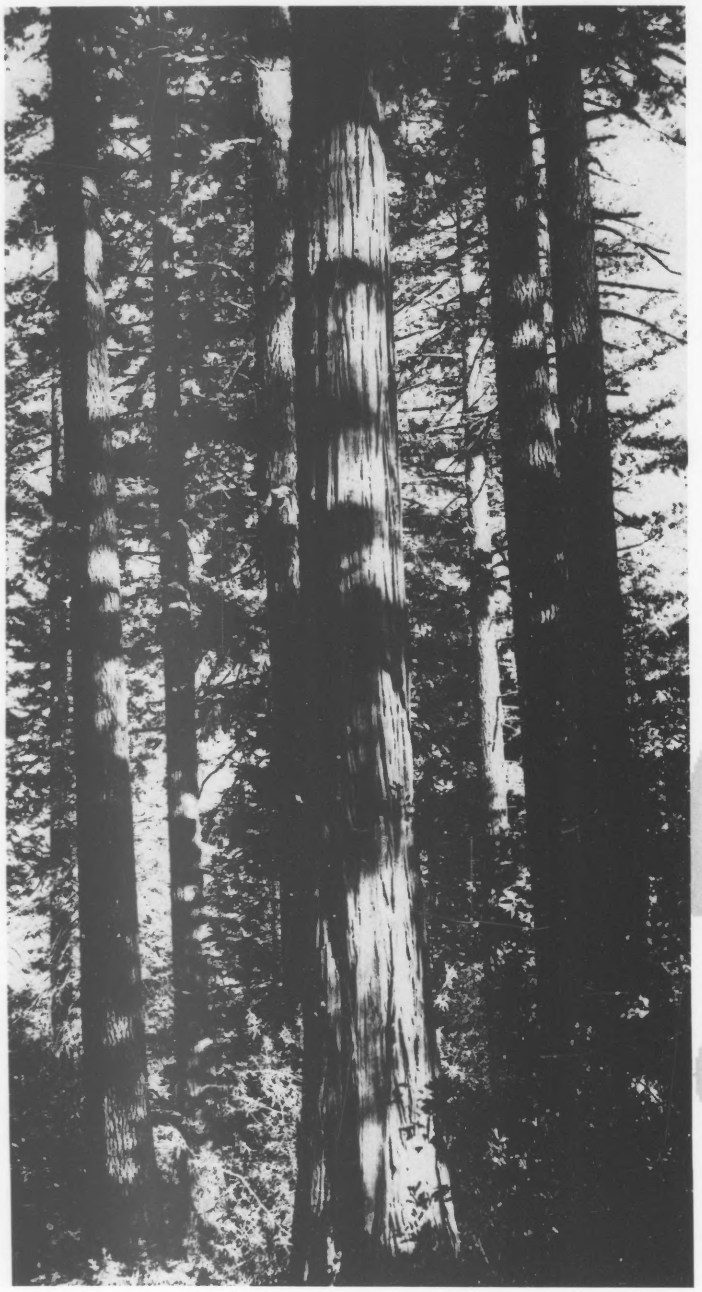
Many farm ponds, formerly used as watering holes for cattle, will produce a profitable crop of trout readily sold to both the midwest and northeastern markets. Extension will help develop successful techniques for "farming" this trout. Extension will provide farmers with software programs that will help with recordkeeping and management decisions. In addition, Extension information on preparation and nutritional value of trout will increase consumer interest in it.

Extension specialists will assist farmers in exploring other uses for their land. Farmers will be directed to such alternative agricultural opportunities as growing Christmas trees or allowing hunting for a fee.

The future is bright. Extension expertise on natural resource products and their management will open up new choices for Minnesota landowners.

Extracted from *"Focus On Natural Resources - A Statement of Direction And Priorities For The Minnesota Extension Service."*

The Wonders Of Wood



Conservation and Management of Natural Resources begins with these words: "The profitability of rural enterprises and the revitalization of rural communities depend on crops, products, and services based on natural resources." Within this initiative, the issue on marketing natural resource products and services contains the concepts that opportunities exist to expand markets for existing products, develop new markets, create new products, and provide new alternative enterprises through natural resources. Wood, a renewable natural resource and one of many sources of products and services, represents a major industrial raw material. It provides much of our housing and home furnishings, considerable energy, most of our paper, and many other products.

The total wood industry involves from 7 to 10 percent of total national industrial employment, payroll, value added, and capital expenditures in plant and equipment. This share does not include the wood portion of construction and sales. Much of this economic activity is located in rural America, and the wood to support it comes from the tree-growing areas of rural America.

Wood is a complex, modern material whose properties and uses we have just begun to explore. Only a few land-grant universities have adequate teaching and research to provide strong support to wood products Extension programs. How, then, can the Cooperative Extension System respond to the exciting challenges of wood?

New Extension-Forest Service Program

Thanks to a cooperative agreement between ES-USDA and the Wisconsin Cooperative Extension Service with support from the Forest Service Forest Products Laboratory at Madison, we have built in the last 3 years the strongest link ever between Extension and Forest Service wood products research. The National Wood Products Extension Program (NWPEP) has the purpose of delivering wood products technology to Extension audiences through the traditional Extension delivery system. Extension personnel work at the U.S. Forest Service Forest Products Laboratory (FPL) with researchers to translate research findings into everyday language for use by Extension. Next will be a joint venture in which NWPEP and Extension will team with Forest Service Research, Forest Service state and private forestry, and state forestry services to transfer wood products technology to users.

NWPEP has demonstrated that the Cooperative Extension System can be used to get wood products research information to local users. Through the project's newsletter EXTEND, staff send new research information quickly and effectively to over 500 professionals.

Donald E. Nelson
National Program Leader,
Extension Service, USDA
and
Theodore A. Peterson
Extension Program Leader,
Forest Products Laboratory,
Madison, Wisconsin

Practical Research Applications
In the Midwest and Southeast, NWPEP promoted the Saw-Dry-Rip (SDR) process, which results in lumber for houses from under-utilized hardwoods. FPL researchers developed a color test procedure to separate white oak from red oak. This test now facilitates export trade with European Economic Community (EEC) countries, eliminating costly fumigation requirements. NWPEP also provided timely updates on revised federal regulations.

The financial gains or savings from applying the technology of wood use are impressive. Proper drying of wood has prevented huge losses wherever dry kiln operators have been trained by Extension. For example, the 1985-86 attendees of Pennsylvania hardwood lumber drying workshops saved the industry $271,000 though improved lumber quality. Four North Carolina nonwood businesses capitalized on the latest technology from Extension, of using wood residues and they are now saving $450,000 per year in fuel costs.

Although individual homeowners do not save large amounts from better use of wood, the collective saving of groups of homeowners through proper painting, refinishing, rehabilitation, and do-it-yourself, is likewise impressive. A sample of just 336 of 12,000 Texans showed they saved $35,000 from applying information received from Extension. If this average savings of over $100 each could be projected to all 12,000 receiving the training, collective savings from application of this technology would be over $1 million in Texas alone.

The importance of the direct link to research cannot be underestimated. For 75 years the U.S. Forest Products Laboratory (FPL) has been a world leader in all aspects of fundamental wood products research. FPL has helped extend the world's supply of wood through more efficient raw material use, through increased product longevity, and through creative product development. Wood products research information from FPL and from other agencies and universities can help achieve the objectives of the "Conservation and Management of Natural Resources" initiative, as well as aspects of the National Initiatives on Revitalizing Rural America and Competitiveness and Profitability.

Future Emphases
We are planning to build on our past successes to develop stronger programs in the next 3 years, thanks to a remarkable set of events coming together at the same time:

1) The Extension Service and the Forest Service have agreed to continue this wood products technology transfer program for 3 years, so we can better plan and execute long-range projects.

2) FPL has taken its responsibilities in technology transfer seriously, so cooperation with researchers in developing Extension information could not be better. FPL wants to become a more "user-friendly" research laboratory.

3) The State and Private Forestry branch (S&PF) of the Forest Service is developing an integrated and expanded technology transfer plan and will staff an organization at FPL that will work closely with our Extension program there. S&PF thus brings its own national and regional wood products specialists into technology transfer, as well as the state forestry wood utilization and marketing specialists. At the state level, Extension and state forestry specialists will work together on projects of mutual interest.

4) FPL has welcomed greater S&PF, Extension, and industry feedback of research needs to researchers, including some regional workshops specifically for this purpose.

5. Extension is playing a stronger role than before as the Forest Service develops its individual, interagency technology transfer plans. A current example is the timber bridge technology transfer plan, which will provide the information needed by local decisionmakers to consider relatively inexpensive timber bridges, some using local materials and labor, as an alternative to other kinds of bridges for rebuilding rural transportation systems.

6) Our own National Initiatives.

In summary, we are developing a strong wood products Extension program in support of the "Conservation and Management of Natural Resources" initiative, other Extension national initiatives, and several Forest Service initiatives as well. The National Wood Products Extension Program, located at the FPL, facilitates the transfer of wood products technology developed at the FPL and elsewhere, through the nationwide Cooperative Extension System. In this way, Extension is linked closely with important national wood products technology transfer efforts of the Forest Service, other federal and state agencies, and industries.

For further information contact: Theodore A. Peterson, Program Leader (608) 264-5730 or Gerald E. Sherwood, Visiting Scientist (608) 264-5727, National Wood Products Extension Program, Forest Products Laboratory, One Gifford Pinchot Drive, Madison, Wisconsin 53705-2398.

4-H = Fishing + Families + Fun

Sharl L. McCarty
4-H Extension Specialist,
Fisheries And Wildlife Department,
Michigan State University, East Lansing

Opposite: Baiting a handline is easy when dad shows daughter how it's done at the Michigan 4-H leader-youth Fishing Weekend Workshop. Right: Father and son learn about fishing and family ties during workshop.

Michigan's Indian name means "place of great waters." With its two peninsulas set among four of the five Great Lakes, Michigan has shorelines longer than those of any other state, except Alaska. Over 35,000 inland lakes dot the state and over 36,000 miles of streams and rivers wind their way through the greenery.

For many of Michigan's citizens, especially the youngsters, this plentitude of water represents a quick and easy trip to a "fishin' hole." The state is graced with many active fishing organizations such as Trout Unlimited, Michigan Steelhead And Salmon Fishermen's Association, B.A.S.S., and others that offer workshops to teach adults about fishing.

Bait For A 4-H Workshop

In 1985, with the goal of increasing 4-H'er involvement in the Michigan 4-H Fish, Fun, Food and Fellowship Project, Extension fisheries specialists at Michigan State University began planning for a special leader training workshop. Early in the planning, Extension Fisheries Specialist Donald Garling recognized the need for a new approach to leader workshops in fishing.

The challenge to Extension was to design a different leader training event to specifically attract those adults most interested in sharing their knowledge with young people. In 1987, with this goal in mind, Extension fisheries and wildlife specialists conducted the first Michigan 4-H Leader-Youth Fishing Weekend Workshop. Every adult attending this workshop was encouraged to bring a youth, and every youth that attended was required to be acompanied by an adult.

Workshop Benefits

Extension specialists soon recognized that this innovative workshop design offered many advantages over traditional "adults only" formats. Most importantly, beginning volunteers were able to put their teaching skills into immediate use. The weekend workshop culminated in a teaching session where adults taught their youngsters hand-line fishing. Specialists had provided prior instruction to the adults and attended this session to offer tips on coaching and teaching.

Some leaders reported that being able to bring their youngsters to the workshop was "the deciding and most important factor" affecting their attendance. Today's busy parents, many of whom are single, are less able to spend an entire weekend away from children to attend a training session.

Fishing Workshop

In May 1987, over 60 workshop participants met at the W. K. Kellogg Biological Station in

southwest Michigan for a Fishing Weekend Workshop. An equal numbers of youths and adults attended.

During some sessions, adults received instruction on teaching methods and club organization, while youths learned tackle preparation. Most fishing "how-to" sessions included both youth and adults.

Participants travelled to the nearby fish hatchery at Wolf Lake operated by the Michigan Department of Natural Resources. There, a tour led by a naturalist, offered insights into the biology and management of fishes of the Great Lakes region.

At the workshop a fly-tying expert and a local bait-and-tackle retailer gave demonstrations. Glen Dudderar, Extension wildlife specialist, taught participants everything from hooking a fish to cleaning the catch. Chuck Pistis, Michigan Sea Grant Extension agent, concluded the workshop with demonstrations in fish preparation.

At the last session, the anglers dined on a meal which included samplings of smoked fish, grilled fish, and a "Great Lakes Fish Boil."

Results

Following the workshop over 90 percent of the adult participants reported an increase in knowledge about fish and fishing. Sixty-three percent of the participants reported improved teaching techniques, and 75 percent felt the workshop was "useful" or "very useful."

For 92 percent of the adult participants the inclusion of youth at the workshop positively influenced their decision to attend. One parent thanked workshop coordinators for "an opportunity for parent-child quality time."

The presence of youth at the workshop did not detract from the adults' experiences as some workshop organizers believed it would. Instead, over 90 percent of the adults reported that having the youth there enhanced their own experience. "The enjoyment of fishing as a youth," said one adult, "is still remembered."

The leader-youth workshop model received "rave reviews" from both adults and youth alike. Since the workshop, several attendees have been involved in local 4-H fishing program activities. 4-H programs can not only teach life skills gained from constructive use of leisure time, but also can ensure a sound future for our fisheries and aquatic resources.

New Markets For Low-Grade Wood

Nicolas Engalichev
Extension Forest Products Specialist, Marketing And Utilization, University of New Hampshire, Durham

In New Hampshire, where more than 87 percent of the land area is covered by forests, the issue of balanced utilization of wood has been one of the major concerns of Extension at the University of New Hampshire, the New Hampshire Department of Resources and Economic Development, and a number of industry associations.

Historically, higher quality trees, prized for the production of lumber, furniture, boats, veneer, and other products, have always been sought after while low-grade trees and undesirable species saw little or no demand. For many years, the lack of economic markets for these poor grade materials served as a rationalization for not applying sound forest development practices recommended by professional foresters.

New Hampshire's forest resources are nearly evenly distributed between softwoods like pine, spruce, fir, and hemlock, and hardwoods like red oak, sugar maple, yellow and white birch, ash, and red maple. "High-grading" harvesting practices—the removal of higher quality trees leaving the rest behind—has led in the past to the gradual degradation of forests and a product mix with an increasing percentage of low-grade material.

However, in recent years, educational programs in the state, coupled with strong private initiatives and favorable economic trends, have contributed to a significant improvement in the development of marketing opportunities for all grades of wood. Technological advances and new concepts in wood use have created new marketing opportunities in the pulp and paper, industrial plywood, and composite board industries.

Effects Of The Energy Crisis
The energy crisis of the 1970s encouraged the use of wood for residential heating in many areas of the Nation.

In addition, the energy crisis spotlighted the benefits of generating electric power using forest biomass fuel. In 1978, the Public Utilities Regulatory Policy Act set up regulations to establish and operate small independent energy plants using biomass, hydro, solar, and wind as alternate energy sources.

The Act mandated that small power producers be paid by the utilities at a rate equal to the utilities' "avoided" cost—the cost that utilities avoid by buying power rather than expanding their own generating capacity. Prompted by this legislation, a number of plants were built in the state and thus provided long-term demand for large volumes of formerly "unmarketable" low-grade materials.

Markets For Low-Grade Hardwoods
In the mid-1960s, a study conducted by the Agricultural Experiment Station at the University of New Hampshire, under a grant from the U.S. Department of Commerce, identified opportunities for growth in the state's pulp and paper industry.

In subsequent years, technological advances permitted the use of hardwoods in the pulping process. The ample supply of low-grade hardwoods made possible a 50-percent increase in pulping capacity and, in turn, established a new market for some 350,000 cords of pulpwood per year.

Structural Board Industry
In the late 1970s, projected growth in the housing industry encouraged investment in the developing structural board industry. Abundant low-grade softwoods and aspen—unsuitable for lumber and plywood production—were ideal materials for composite panel production.

Biomass Harvesting
In 1984, a study—"Assessment of Biomass Harvesting On Small Woodlots In New Hampshire"—was conducted by Extension at the University of New Hampshire and the New Hampshire Division Of Forests And Lands under a grant from the U.S. Forest Service. The study, which documented an annual surplus of 2 to 3 million tons of wood available for biomass fuel, concluded that low-grade tree harvesting and chipping, when practiced properly, was not only feasible but desirable.

Whole tree harvesting and chipping, coupled with proper techniques of forest care and development, constitutes an economic tool that upgrades the quality of the forests.

Balanced Demand
The current timber quality in New Hampshire is such that 20 percent of the total harvest finds markets in solid wood manufactured products, 20 percent in pulp and paper and reconstituted wood products, 20 percent in residential fuelwood, and 40 percent in biomass energy.

A major benefit of achieving balanced demand for all qualities of wood produced in the region is the unique opportunity for landowners to apply recommended forest management practices. These practices will lead to the gradual upgrading of timber quality with an increasing percentage of future crops going to higher value markets in the manufacturing sector.

The projection for the annual value of products from the forest industries in the state—assuming improvements in timber quality—are for a rise over the current $1.5 billion level, as it continues to be an important component of the gross state product.

(Continued from page 2)

Extension's Role In Conservation— A Proposal

Technical, economic, and social changes have been sweeping through agriculture and natural resources. We have been caught in a revolution that has changed almost every aspect of our work. This revolution has not only made it difficult to keep current with agricultural science, it has also altered the basic premise that supports a public education and information agency in agriculture. The historic mission of Extension, then, has to be examined and changed, perhaps, if the Cooperative Extension System's future is to reflect its past glory.

What, then, are priority needs for Extension?

We have too much soil erosion. We need strong public voices stating that profitmaking this year must be balanced with long-term stability of the land base. We need public voices stating that a society that destroys its soil destroys itself.

We have too much monoculture. We need strong public voices pointing out that complex ecosystems are more stable than simple ones. Further, they need to state that mixtures of crops, pastures, woods, brush patches, and odd areas are not only consistent with the physical needs of the land, but they also create more complex ecosystems than monocultures. Such systems can be more resilient under the stress of weather and pest population cycles. Complex ecosystems that flex under pressure are more resilient to economic tidal waves too, so there is a strong hint of "farmer survival" as well as "land survival."

How do these different needs change the requirements for public information and education? We need Extension to teach educated farmers how to survive—how to live with the natural world instead of fighting it. Extension needs to articulate the conscience that drives the use and management of the country's lands. This conscience role includes:

1. Constant recognition that the land is more than an inanimate structure that can be rebuilt if the current owner treats it badly. Rights of the current owner do not include destruction of the land or its productivity. Land ownership is a privilege granted by one of the most generous societies in history regarding property rights. That privilege has limits. Public agencies must articulate the limits, make these part of the public policy dialogue. Then, if society wishes to change policies it can do so, based on knowledge, not ignorance.

2. The conservation message. Conservationists are descended philosophically from great thinkers such as Bennett, Pinchot, and Leopold. It is important to live up to that heritage, to speak out about using the land with consideration of a balance of economic, ecological, and aesthetic impacts. It is not unethical to use the land; it is unethical to abuse it. We must communicate the reasons for that judgment and help people understand how to identify the line between use and abuse. If Extension does not help to identify that line, and communicate it well, others will. Extension stands to lose one of the major purposes for its existence.

3. Recognition that land use does not exclude ecological and aesthetic values. Recent years have seen Americans make great strides in articulating ecological values; communicating aesthetic considerations seems tougher. A place well tended is far more beautiful than a place abused. Often, as Rene Dubos has reminded us, a place well tended is more beautiful than one in its natural state. Extension workers know this, yet may not want to share these beliefs, fearing they will be accused of being impractical.

In fact, consideration of beauty is practical. People are moved by what they see on the land, and when they are moved, they act. Extension workers may find that these aesthetic issues are key in how the public judges Extension's program and value. You can tell people you are saving soil or growing better timber, holding the costs of food down, or improving rural life. But if, in the process, you help or encourage the creation of ugliness, you have a problem. Ask foresters about clear-cutting, if you have any doubts.

Extension workers must strive to create or encourage beauty as well as function, if they are to earn public support. Wendell Berry has argued that ecological harmony leads to pleasure. I believe that and think that Extension staff do, too. If public programs "please" the public by the way they operate and look, then these programs will have taken a great step toward earning (perhaps re-earning) the respect of the American people. With that respect, programs, technologies, and agencies will remain vital, alive, and able to adapt to whatever change affects agriculture and forestry. Without that respect, some of these programs may be only a few steps from extinction.

Neil Sampson
Executive Vice President,
American Forestry Association,
Washington, D.C.

United States
Department of Agriculture
Washington, DC 20250

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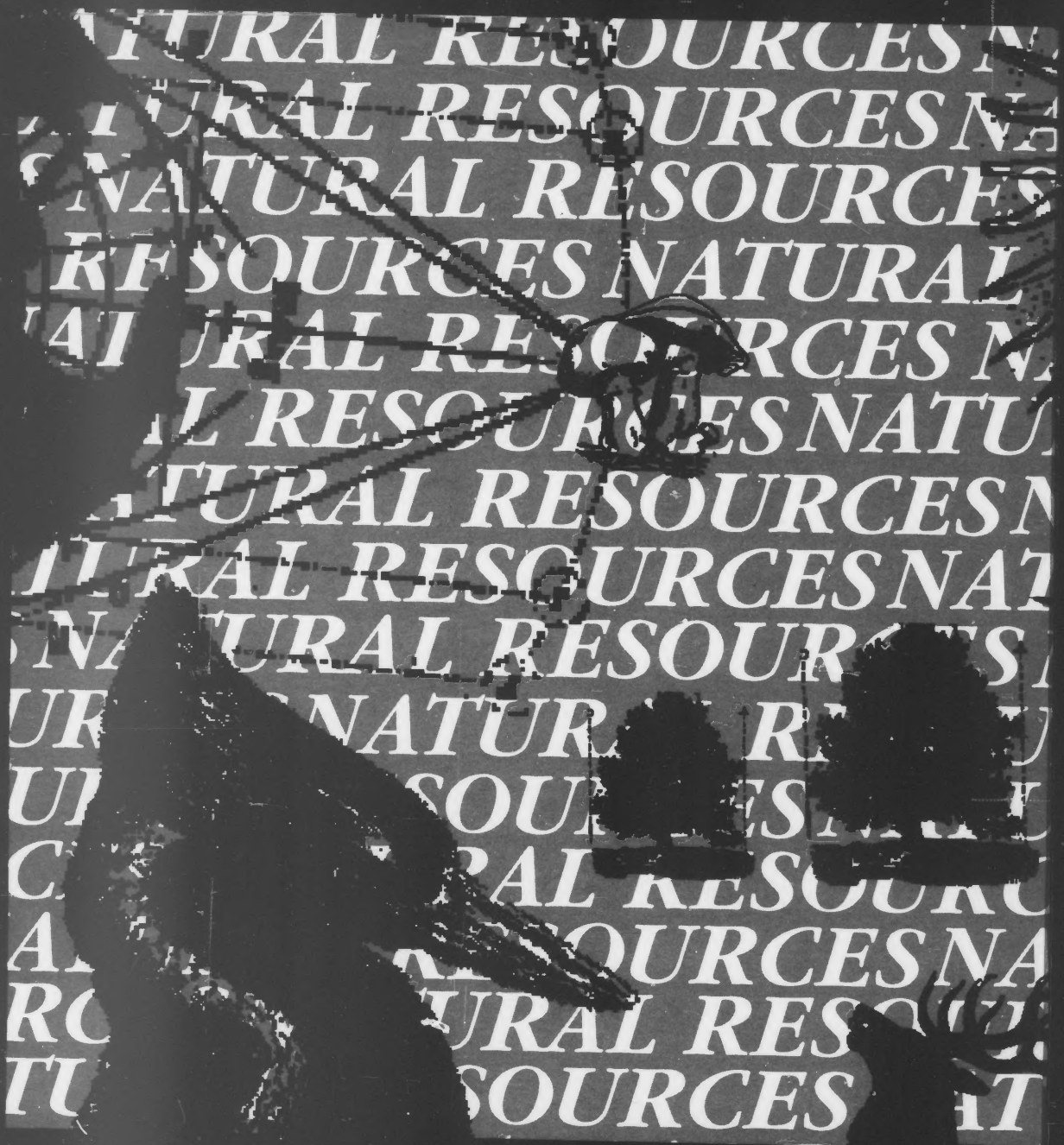

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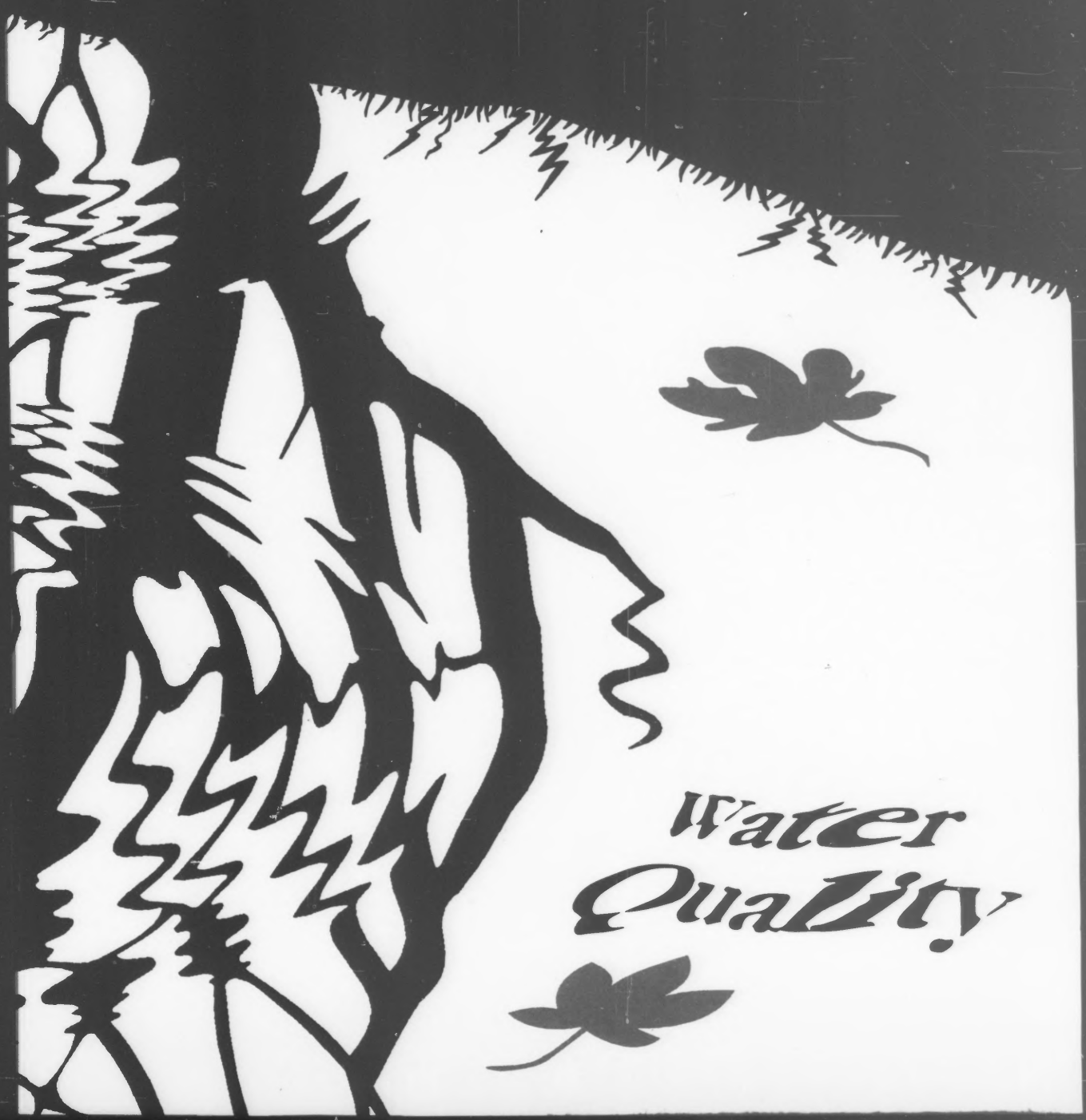
United States Department of Agriculture Fall 1988



Water Quality

Water Quality:

A Challenge For The Cooperative Extension System

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Extension Committee on Organization and Policy (ECOP),
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Quality water is an integral part of the agricultural and industrial growth of our country. There has been a fundamental assumption that water of good quality is available to support the population growth and agricultural and industrial development in the United States. Now, people are beginning to find that this fundamental assumption is no longer valid, and we must now find ways to improve water quality to continue our growth and development and to protect the health of our citizens.

The water quality issue is now being emphasized in different—often negative—ways; medical debris on beaches, oil pollution on the Ohio River, selenium in the Kesterson Reservoir, assorted chemicals in the groundwater, and the (largely undocumented) effects of nitrates in drinking water.

The Cooperative Extension System (CES) has, for some time, been aware of, and gearing up to meet, the challenge of water quality. In 1984, Extension Service-USDA and the Extension Committee on Organization and Policy (ECOP) appointed a national task force to assess the groundwater quality situation. That task force report—published in February 1986—identified opportunities for the Cooperative Extension System, and recommended increased programming.

This work led to the identification of "Water Quality" as a national priority initiative for the Cooperative Extension System, and the identification of four critical issues (see page 4 of this magazine).

The Water Quality Initiative report, published in January 1988, was released at a national workshop for Extension Directors and Administrators. By the end of the 3-day workshop, Water Quality was identified as one of the pre-eminent national initiatives.

Shortly thereafter, ES and ECOP endorsed a statement on water quality programming that committed the Cooperative Extension System to increased effort and to the reporting of quantifiable impacts. This was followed by a national workshop for Extension personnel, which attracted 165 participants from 44 States (see article, page 5).

Programming Advanced

Since that time, ES and the state CES have been advancing the timing and intensity of water quality programming. This effort has included the signing of a memorandum of understanding between ES and the Soil Conservation Service, and the development of a unique roles document, which articulates the roles of these two agencies. These have been followed by a series of CES-SCS regional workshops, where active cooperation could be dramatically increased.

The Department of Agriculture (USDA) has greatly increased its involvement in water quality. In 1987, policy statements on nonpoint source pollution and on groundwater quality were adopted. USDA has also developed a coordinated water quality effort, which includes discussions with both the Environmental Protection Agency and the Department of the Interior.

Congress has recognized the need, as well. The ES budget for Fiscal Year 1989 contained the first specific appropriation for water quality programming. This "first small step" will be closely scrutinized as the CES gears up to "help people help themselves."

We estimate that the CES now invests about $20 million per year in water quality programming. These efforts include the programs and activities described in the ensuing articles. We fully expect to see that amount, the number of programs, and the impacts on "how people do things" (the *results)* increase dramatically.

While all of the identified "critical issues" (page 4) are critical, there are three components of particular interest. These fall under critical issue No. 2, and may be paraphrased as: "What are the impacts of *agricultural pesticides* and *nitrogen fertilizers* on water resources, water uses, and water users?" and "What can people do about it?"

The CES is rapidly moving to address these issues in a positive way. Programs to address the impact of agricultural pesticides and nitrogen fertilizers are blooming; these will be accompanied by greatly increased staff training and by programs to encourage rural residents to test their water-supply wells.

Essential Focus

In all of these programs, there are two overriding concerns. First, we must continue to focus on people, and on what people do, especially as a result of our programs. Second, we must be able to show *results*; how many rural residents actually had their wells tested? How many farmers changed their nitrogen (or pesticide) management practices? How did they change them? How did this affect inputs of these materials into the environment? Finally, we may even ask what effect these programs had on water quality. Our focus must be on *people*, and what *people* do to enhance or protect water quality.

We have every confidence in the CES, and in the ability and dedication of the people who constitute the CES. As Extension responds to local water quality needs, we will—in concert with many other public agencies—impact how *people* practice good stewardship of our Nation's water resources. We have a mission, and we are acquiring increased resources; we must produce results. ▲

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National Initiative: Water Quality

Situation
Over 95 percent of the Nation's rural residents depend upon groundwater for drinking water; more than one-half of the total population drink groundwater. Every American is dependent upon water for health and well-being. Our water supplies are sometimes contaminated and frequently perceived to be jeopardized by chemicals (including agricultural chemicals) from septic systems and other sources.

There is a need for public education programs on the importance of high-quality water to life, well-being, and agricultural production; on the need to use water resources wisely; on the impacts of agricultural and other chemicals on water quality; on methods of conserving water supplies; and on the development of appropriate policies to assure adequate supplies of quality water.

Critical Issues
To meet these national challenges and opportunities, Cooperative Extension System programs must address four critical issues:

Issue 1: Public understanding of water resources, especially the nature of the resource—where it occurs, why it is vulnerable, how it is used; the interactions of human activities and water quality, and the options for protecting water quality or making it safe.

Extension Goal: To develop private and public understanding of the nature of the interactions between human activities and water quality.

Extension Role: Deliver appropriate educational programs to the audiences most affected, notably rural residents and local government officials.

Issue 2. The impacts of agricultural, industrial, and household chemicals on water quality and subsequent uses and users of water.

Extension Goal: Provide appropriate programs to those who use such chemicals or who develop policies governing their use and disposal.

Extension Role: Make audiences aware of actual or potential impacts; help them adopt appropriate technologies, strategies, and policies to minimize chemical contamination of water resources.

Issue 3. The importance of water conservation programs and strategies for domestic, agricultural, and municipal water consumers to meet local problems such as drought-induced shortages, declining water tables, increased pumping costs, and increased production and treatment costs.

Extension Goal: Promote public awareness, understanding, and strategies or policies to respond to state and local needs.

Extension Role: Develop and deliver appropriate educational programs in areas where such matters are of private and public concern.

Issue 4. The key role of local government officials in developing strategies for addressing the public concern about the interactions of land use, chemical use, and water quality.

Extension Goal: Work with an aware, informed, knowledgeable cadre of elected or appointed officials in developing appropriate policies to protect the quality of community water resources and thereby enhance well-being.

Extension Role: Deliver programs to assist government officials in developing appropriate strategies. ▲

The Water Quality Initiative Workshop

Fred Bergsrud,
Extension Agricultural Engineer,
University of Minnesota
and
Sharon Hogan
Advisor/Consultant,
Chesapeake Bay Project,
University of Maryland CES,
and
Elva Farrell
Sarasota County 4-H Agent,
Sarasota, Florida

The Water Quality Initiative Workshop, held February 16-18, 1988, at the National 4-H Center near Washington, DC, had the objective of exchange of program information. The National Coordinating Committee (co-chaired by Denzil Clegg, Associate Administrator, ES-USDA, and Chet Black, Director of the North Carolina Agricultural Extension Service) and the Water Quality Initiative Task Force (co-chaired by Fred Swader, National Program Leader, ES-USDA and Art Hornsby, Extension Soil Specialist, University of Florida) set this goal for the workshop. The Water Quality Initiative Task Force (WQITF), in planning the workshop, chose to focus on successful programs and program components through working sessions and a resource fair. The WQITF identified resource persons who were potential for participants in the program.

Material presented at the workshop needed to be useful also to people who did not attend. The WQITF designed and sent to participants, in advance of the workshop, specific forms for handout materials that would discuss the objectives and key elements of the model programs being presented. Resource fair participants were encouraged to prepare these materials to describe specific program materials or lists of resource materials available from their states.

WQITF organized the resource fair. Equipment demands made it clear that the people involved in water quality educational programs are leaders in the use of the latest technologies. Many requested computers or VCR's. Exhibits were excellent. The participants, through their interest and energy at the resource fair, made our efforts worthwhile.

The workshop was opened by Charles Benbrook, Executive Secretary of the Board on Agriculture, National Research Council, who challenged the participants, observing that water quality seemed to be an unusual program area for Cooperative Extension. The workshop format was a "triple threat," with plenary sessions in the mornings, workshop sessions in the afternoons, and the resource fair in the evenings. Attendance was excellent—165 people from 44 states.

Plenary speakers covered a wide range of topics, ranging from "The Politics of Regulation" (David Allee, Cornell University) to "Risk Assessment" (Frank Post, Oregon State University). The workshops provided examples of successful programs, ranging from "Chemigation" through "Nutrient Testing" to "Radon". The Resource Fair had displays from Puget Sound to Florida, and from Arizona to Connecticut

Exhibitors provided data sheets and resource material lists. During the workshop, members of the WQITF collected copies of the material from each exhibitor and supplemented that information by visiting each exhibit and copying information not available on the data sheets. That material has been compiled, reproduced, and distributed to all workshop participants and water quality state contacts in a "Water Quality Resource Materials Catalog." The 40-page catalog contains summaries of the state and regional water quality programs presented at the resource fair. Each program summary includes a list of resource publications and materials. Programs from all Extension disciplines: Agriculture, CRD, 4-H, and Home Economics, are represented. To obtain a copy, contact Debra Henderson, ES-USDA; 3344-S, South Bldg., Washington, DC 20250-0900. Phone: (202) 447-5369. ▲

Safe Water

Lorraine B. Kingdon
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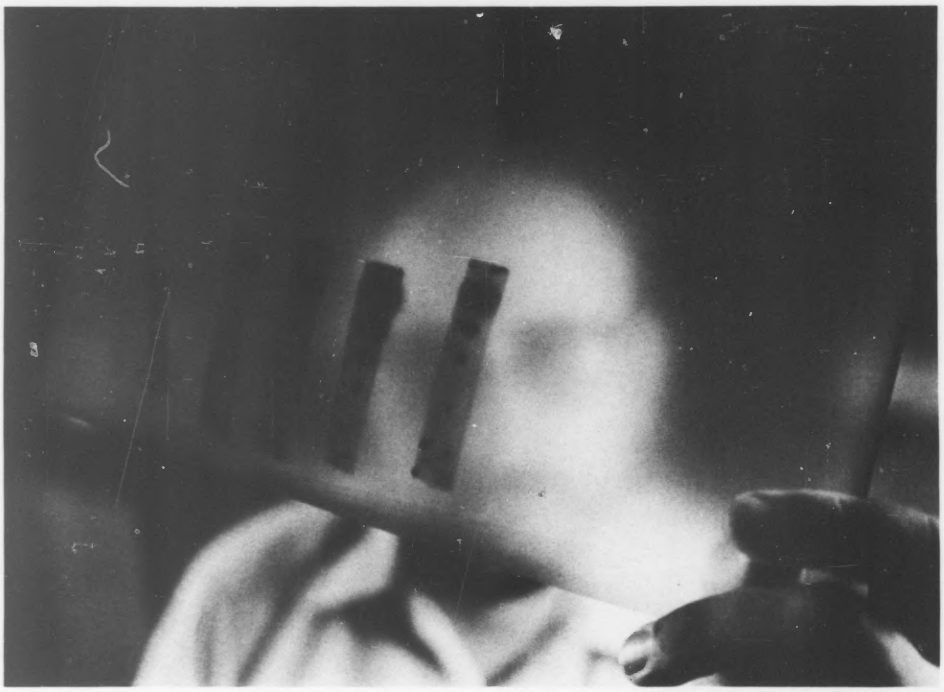

Bacteria and viruses contaminating the water pose a thousand times greater danger to health than do any other contaminants, including chemicals.

University of Arizona (UA) Environmental Microbiologist Charles Gerba can prove that rather startling statement. He has tested water—wastewater, drinking water, well water, water in rivers and streams—in Arizona, all over the United States, and in many other parts of the world.

Although about 40 outbreaks of waterborne diseases are reported in this country every year, Gerba believes many other cases are never reported. Viral contamination causes 65 percent of the outbreaks. An extremely low level of viral contamination can be an infectious dose.

Extent Unknown
Twenty percent of the groundwater samples Gerba tested were contaminated with viruses. Gerba believes no one really has a good idea how many people are being exposed to viral contamination in their drinking water.

He says viral contamination may be more common than expected, particularly in rural areas. Poorly placed septic tanks are the primary villain; septic tanks should not be used when the groundwater table is too high or if there is not enough soil for water to percolate effectively.

New Testing Technique
Until very recently, testing for viruses in water has been a tedious, expensive process. The standard cell culture tests require a minimum of 2 weeks; only one kind of virus can be tested for each time; and the price ranges from $300 to $2,000.

Gerba has developed a gene probe test that is so sensitive it can detect one virus particle in 1,000 liters of water—phenomenal accuracy. Test results are available within 48 hours, and it is possible to test for more than 70 different viruses at one time. The cost probably will eventually be less than $100 per test.

Temperature Is Greater Factor
Gerba has studied how water acidity, nitrate and sulphate chemical content, mineral content, and water temperature affect virus survival. He found that water temperature has the strongest effect.

Knowing the temperature of the groundwater and the rate at which it flows through the ground, Gerba can predict the distance the water can travel before disease-causing viruses are killed. Using this method, he has developed a computer model for microcomputers that will predict the safe distance between a well and a septic tank.

Recycling Grey Water

Gerba also has done an intensive study of the growth and survival of microorganisms in grey water—the wastewater from bathroom sinks, baths, showers, laundry, and dishwashers. He found that it could be used safely for underground drip irrigation on lawns and flower gardens. Other uses, such as surface irrigation, would require disinfection.

At the University's experimental conservation home in Tucson, for example, the grey water is collected in a sump, passes through two tanks containing water-purifying water hyacinths and through sand filters. The hyacinths use organic matter and bacteria as food, reducing contaminant levels by 99 percent. The sand filters take out more bacteria and reduce turbidity. By this time, bacterial levels are cut 99.9 percent from when the water was collected.

Gerba also compared microorganisms in the grey water from six other homes in Tucson. The home owners were an older couple, two young couples, and three families with young children. The total bacterial count was not significantly different among the households. However, the kind of bacteria he found in the water varied with the number and ages of the children, the kinds of diapers that were used, and the kinds of activities engaged in, such as gardening.

Particularly if someone in the household were ill, such grey water could contain bacteria that would present a public health hazard if reused without treatment. Viral contamination of grey water can be high, because viruses are very resistant to detergents and soaps and even to disinfectants.

Opposite top: A water-borne virus appears as a black spot on X-ray film. Below: Charles Gerba, environmental microbiologist at the University of Arizona, is the developer of quick tests for water contaminated with bacteria and virus. At left: Charles Sterling, veterinary parasitologist, University of Arizona, uses a microscope to examine disease-causing parasites crypto *and* giardia *found in water.*

Other Contaminants

Disease-causing parasites—including *giardia, cryptosporidium* (*crypto*), and *E. histolytica*—are also found in water. *Crypto*, for example, can be a serious problem. In humans, this parasite can cause severe nausea and diarrhea lasting from 1 to 3 weeks. It also is one cause of a serious disease that is widespread in dairy calves. Calf scours results in an annual loss of at least $200 million to the cattle industry.

Most waterborne incidents of *crypto* infections have been in smaller towns served by surface water that is treated only with chlorine; this common water disinfectant is not effective against parasites. Gerba has started surveying the surface water for the three contaminants at 100 sites across the United States. Charles Sterling, working closely with Al M. Lane, Extension livestock specialist, and Edward Bicknell, Extension veterinarian, has developed highly sensitive tests for *crypto* and *giardia*. ▲

Hooked!

Scott Turner
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Youth learn to fish, scuba dive, and snorkel at the Ohio 4-H Sea Camp held on Kelleys Island on Lake Erie. The camp, conducted by Ohio CES and Ohio Sea Grant, seeks to educate 4-H'ers in the wise use of Ohio's greatest natural resource.

An avid explorer of aquatic life near his home in Circleville, Brian Frank, 14, is zealous lecturing about fish in the food chain in Lake Erie, 150 miles away. He'd only been to Lake Erie twice, but Brian, along with 64 other Ohio teens, studied the world's 12th largest lake firsthand when he spent a week in July at the 1987 Ohio 4-H Sea Camp on Kelleys Island.

Campers there range from those hoping to become aquatic biologists to those who want to learn to fish, scuba dive, and snorkel—the three most popular activities at Sea Camp. Additional sessions include water safety, ecology, lure making, weather study, aquatic science, and boat operation. All are conducted by professional instructors such as Ohio Cooperative Extension Service specialists and agents and Ohio Department of Natural Resources personnel.

Ohio 4-H Sea Camp is conducted by the Ohio Cooperative Extension Service and Ohio Sea Grant with direction from Ohio 4-H agents, district specialists, and volunteer leaders.

Ohio Sea Grant is a state-federal program to enhance development and improve management of state and regional aquatic resources. It seeks wise use of those resources to strengthen the quality of life in surrounding areas through research, education, and Extension.

Denny Weilnau, Erie County 4-H agent, and Duane Plymale, south district 4-H specialist, co-directed the 1987 Sea Camp. Orrin Leimbach, a volunteer leader from Vermilion, and Carolyn Keller, Erie County 4-H program assistant, were the camp's activity coordinators. Fred Snyder and Dave Kelch, district Extension specialists, Sea Grant, conducted several of the camp sessions. Snyder is based in Port Clinton. Kelch works out of Elyria.

Snyder says: "Lake Erie is booming. Fishing is a major industry. Investment in condominiums has skyrocketed. The lake is cleaner and rejuvenated and is drawing people from across the Midwest."

Sea Camp began in 1985. It's open to Ohio teens ages 13-17. Each applicant must write an essay about why they want to attend camp and what they hope to learn. The campers applied through their county Extension office or through their district Sea Grant specialist.

Erie Reborn

"The camp reflects the renewed interest in Ohio's greatest natural resource," Kelch says. "There was a time when Lake Erie was considered dead, a victim of human activities. It wasn't dead but it was close to it."

Today the lake is a playground for boaters, anglers, sunbathers, swimmers, and campers. In 1985, Lake Erie sport fishing generated nearly $123 million in sales by Ohio companies, $43 million in personal income to Ohio residents, and 2,466 person-years of employment.

Much has been done to reduce pollution in Lake Erie, but human activity still threatens the lake and the communities around it. Programs help control toxic discharges into the lake, yet simply dredging a channel can stir up chemical-laden sediments.

In March 1987, for example, an advisory was issued by health agencies in Ohio, Pennsylvania, and Michigan because excessive levels of PCBs were found in Lake Erie carp and catfish. PCBs are a group of chemicals linked to cancer and other health disorders.

Ripple Effect

"We want the kids to see that a clean lake has a ripple effect," Kelch says. "A healthy environment does everyone good. That's why camp focuses on both natural history and resources. And with Ohio 4-H Camps mixing fun and education in areas such as conservation or leadership, we thought why not do the same in the area of marine education."

Snyder says that this holistic introduction of teens to Lake Erie has led local marine industries and other Lake Erie-related organizations to donate new boats and fishing equipment as well as personnel to the camp.

As teens examined the deep glacial grooves found in Kelleys Island State Park, Snyder explained his Sea Camp philosophy: "I consider Sea Camp a training session for future mariners. I don't want them to misinterpret that a cleaner lake is something to take advantage of. A healthy lake benefits an ecosystem stretching hundreds of miles from its shores."

Sea Camp was the first trip to Lake Erie for Susie Vargo, 16, of Plain City. "Fishing was the best, but seining a marsh and studying its plankton, fish, and tadpoles were fun. I'm interested in teaching and aquatic biology. This shows me I can do both. I've learned more here than I ever did before in a camp."

Julianne Barth, manager of the Big Island Wetland in Sandusky, donated her time to lead the aquatic science sessions.

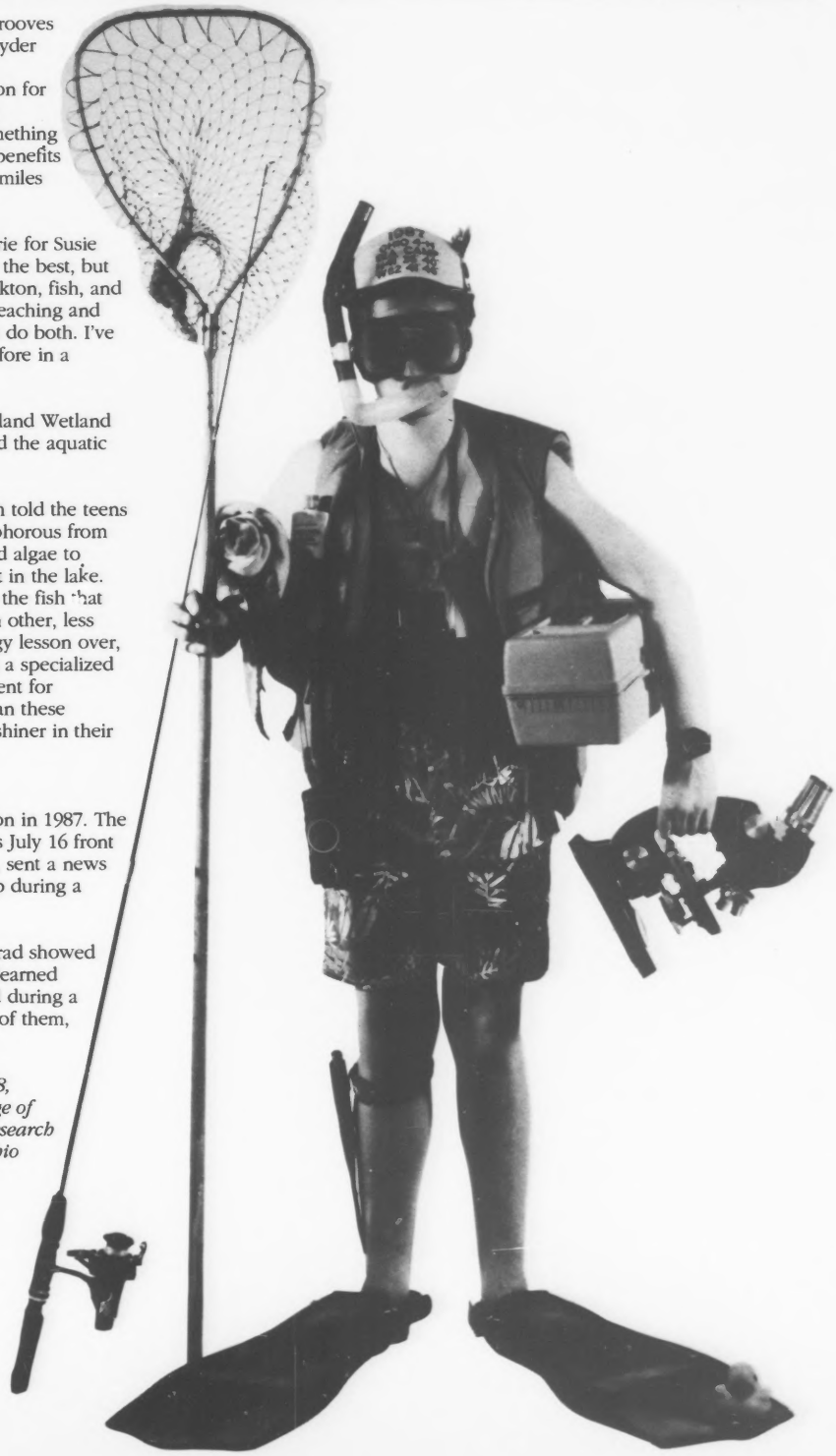
Standing knee-deep in the lake, Barth told the teens that during the 1950s and '60s, phosphorous from sewage and agricultural runoff caused algae to bloom and oxygen levels to plummet in the lake. This caused mayfly larvae to die and the fish that fed on them to die, move, or feed on other, less nutritional insects. History and biology lesson over, Barth sent a group into the lake with a specialized bucket to scrape up a layer of sediment for examination. "Where else but here can these youngsters hold a gizzard shad or a shiner in their hands," she says.

TV Coverage

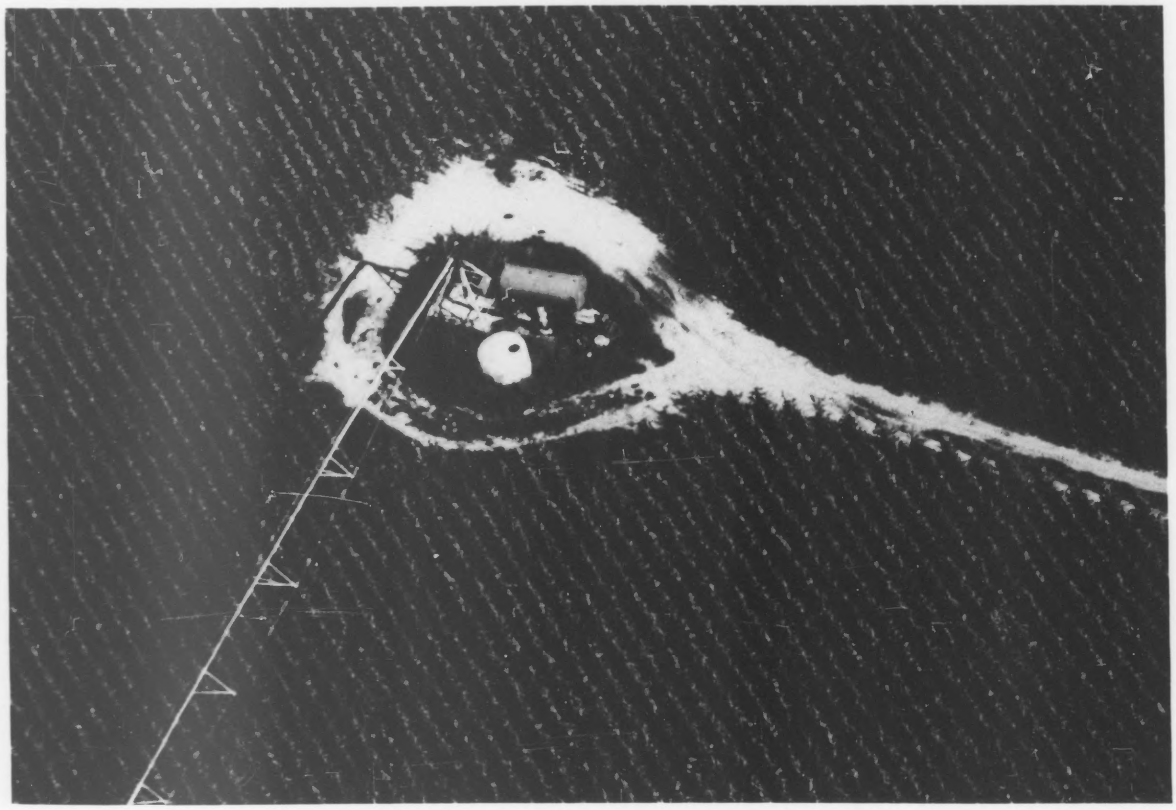
Sea Camp caught the media's attention in 1987. The *Toledo Blade* featured the story on its July 16 front page. WTOL-TV, Channel 11-Toledo, sent a news crew and aired a report on Sea Camp during a Sunday news segment.

On the charter boat fishing trip, Conrad showed that during camp she definitely had learned something: "I almost went overboard during a fight with a walleye. I did catch five of them, though."

Extracted from ***Ohio 21****, March 1988, published semiannually by the College of Agriculture, the Ohio Agricultural Research and Development Center, and the Ohio Cooperative Extension Service of the Ohio State University.* ▲



Education For Chemigation



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Chemigation—you won't find the word in most dictionaries, but it's one that is well known to agricultural producers in many parts of the United States. A combination of the words "chemicals" and "irrigation," it aptly describes the process of applying an agricultural chemical by mixing the chemical with irrigation water.

Although chemigation has been used in Nebraska for approximately 30 years, widespread adoption of the practice coincided with a major expansion of irrigated agriculture in the mid-1970s. As a result of the expansion, about 27,300 center-pivot systems had been installed in Nebraska by 1986. Many of the systems are located on sandy soils, where nitrogen fertilizers applied with irrigation water can result in lower nitrate leaching than when preplant applications are used.

At the height of the irrigation expansion in 1982-83, the Nebraska corn crop experienced unusually heavy infestations of corn borer. In 1983 alone, producers chemigated more than 200,000 acres with insecticide in efforts to control this costly pest.

Responding To Concerns

Concerns that insecticide use for chemigation might increase the potential for groundwater contamination surfaced quickly. In response, the Nebraska

Cooperative Extension Service appointed an interdisciplinary chemigation task force, which took several immediate actions:

• Conduct a workshop for state and local agencies to discuss chemigation issues.

• Update a fact sheet on chemigation antipollution equipment.

• Publish a new fact sheet, *Applying Insecticides Through Center Pivots.*

• Conduct an inservice training session for all Extension agricultural agents.

Legislative Action
Reflecting a continuing concern about the long-term potential for groundwater contamination from chemigation, the 1986 Nebraska legislature passed the Nebraska Chemigation Act. Several provisions of the bill had implications for Extension. Among other things, the law requires that each chemigation site must have a permit; specific antipollution safety equipment must be installed and inspected; and chemigation applicators must be certified by attending a training session and passing a written examination.

The antipollution equipment requirements enacted into law were those that had been recommended by the Nebraska Cooperative Extension Service. Natural Resources Districts (NRD's) issue chemigation permits and conduct equipment inspections. The NRD's are multicounty units established by the legislature; they have significant responsibilities relating to groundwater quality. Extension trained NRD personnel to conduct the equipment inspections.

Implementing The Training
The legislature gave the state's Department of Environmental Control (DEC) the responsibility for training chemigators. Because DEC had only a single individual to administer the Chemigation Act, the agency contracted with Extension to conduct the training and administer the required certification examination.

Less than 90 days after the contract was signed, Nebraska Extension specialists, in cooperation with DEC, implemented the chemigator training program. Each applicator received a notebook containing a basic chemigation manual (essentially the same as the EPA/USDA manual used in the pesticide applicator training program), a copy of the Nebraska Chemigation Act, a summary of that law, DEC rules and regulations for implementing the Act, a calibration workbook, and the publication *Protecting Our Groundwater a Grower's Guide.*

The 3-hour training program covered five topics: the decision to chemigate; Nebraska's Chemigation Act and DEC's rules and regulations, antipollution equipment requirements, chemigation management, and calibrating for chemigation. Each topic was supported with slide-tape packages. The trainers were 12 Extension specialists, representing agricultural engineering (irrigation), entomology, soil fertility, and weed science.

Opposite top: Bird's eye view of irrigation system adapted for injection of agrichemicals. Below: A Clay Center, Nebraska farmer sets out "catch" cans to measure the amount of water delivered by sprinkler heads in an irrigation system. Sprinkler heads must apply a chemical uniformly over the field. Above: A Henderson, Nebraska farmer carefully sets the speed of his irrigation system.

Evaluating The Training
A survey of approximately 1,000 applicators who attended the spring 1987 training brought responses from 578. Nearly three-fourths of the respondents rated the training as either good or very good. Seventy percent of the respondents had preregistered and received the training materials before the training session; 60 percent had studied the material.

Although some participants complained about being required to attend the training and take a test, most producers recognized the importance of protecting groundwater. One participant stated the situation quite succinctly: "We can't afford to contaminate the water. Our kids have to use it, and their kids after them. We have to keep it clean for them." ▲

Old Water For New Citrus

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Millions of gallons of treated wastewater from the booming Orlando metro area are now being used to irrigate central Florida citrus and protect trees from frost damage. Officially known as the Water Conserv II/Southwest Orange County Water Reclamation Project, it is one of the largest water re-use projects in the nation and the first in Florida to irrigate crops intended for human consumption.

To help launch the huge water re-use program—which will eventually distribute up to 75 million gallons of nutrient-rich wastewater daily on 15,000 acres of citrus—Extension agents with the University of Florida's Institute of Food and Agricultural Sciences (IFAS) worked with the city and county area citrus growers to get them signed up for the project.

"The IFAS Cooperative Extension Service has been involved in the water reclamation project from its very inception," says John Jackson, multi-county citrus Extension agent based in nearby Lake County. "And IFAS Extension worked right through the final stages of getting citrus growers to begin using the irrigation water.

"The cooperative nature of this project is a good example of how agriculture can be compatible with Florida's rapid urban growth," Jackson adds. "It's a project where everyone wins—urban areas get rid of treated wastewater,growers get an almost unlimited supply of free water, and the environment is protected.

Energy Costs Reduced

"Moreover, since the water is delivered to participating citrus groves under pressure, growers do not need pumping equipment and energy costs are reduced," Jackson points out. "This, in turn, enhances grove property values by $500 to $1,000 per acre."

In 1979, the U.S. Environmental Protection Agency ordered the city of Orlando and Orange County to stop discharging effluent into Shingle Creek by 1988 to protect fishing and wildlife in the area and improve water quality in connecting lakes.

As a result, the city and county opted for the combination citrus irrigation and rapid infiltration basin (RIB) sytem that began operating in December 1986. Treated wastewater from the city's McLeod Road treatment plant and the county's Sandlake Road treatment plant is now piped some 21 miles to the new $180 million Conserv II distribution center.

Growers participating in the project, Jackson comments, have to sign a 20-year agreement to take anywhere from 26 to 52 inches of water per year. This averages out to half an inch of water per week.

This is high-quality treated water, Jackson says, with about 5 parts per million phosphorous and 6 ppm nitrogen. The sytem is currently handling about 24 million gallons of water daily, with 18 of that going to citrus groves and 6 million going into rapid infiltration basins that allow the water to percolate through the soil into the Florida aquifer.

Jackson was also instrumental in getting 60 acres of citrus grove next to the Conserv II distribution plant set aside for research purposes. He helped organize the Mid-Florida Citrus Foundation, a non-profit organization that leases the research site from the city of Orlando. Scientists from the IFAS Agricultural Research and Education Center in Lake Alfred are measuring how the treated waste water affects things like tree growth, cold hardiness, fertilization efficiency, herbicide treatments, rootstock combinations, and tree density. ▲

Conserving Their Future

A 9-year-old boy in Burlington, Vermont, stares intently at a screen, the graphics riveting his attention. This is not just another child "glued" to a television set. He is a 4-H camper learning about water resources and their conservation in a curriculum developed by the University of Vermont Extension Service.

Linda Marek, the Extension water resources specialist who helped to design the curriculum, explains that it teaches children about the water system and where they, as future adults, fit into the cycle. "If they don't understand how they fit in, they won't know how to protect the water from contamination," Marek says. "We have to make sure Vermont continues to have safe drinking water."

Water is one of Vermont's greatest natural resources, with over 240,000 acres of the state covered by lakes and ponds. Marek points out that, because Vermont's booming population is straining these public water resources, it is important for the state's future residents to know how to protect the resources from contamination.

The educational program focuses on three main topics: the hydrologic cycle, groundwater, and surface water. The counselor—trained by Vermont Extension—begin by teaching about the flow of rainfall onto the ground and through the earth. Then the children learn about ground and surface water and how both become polluted.

Hands On Learning

The counselors use hands-on learning as the chief part of the program. "We don't want to lecture to the kids. Instead, we try to keep them physically and mentally involved," Marek says.

One way to grab children's interest is through computers. The 4-H program uses software designed for children at the junior high school level developed by and purchased from IBM.

The computers are also equipped with moving color graphics much like video games to catch and maintain the children's interest. Many counselors report that campers are so interested that they have to be forced to leave the computer terminal.

In one part of the program, "Human Impact Upon Surface Water," children learn about dams and the problems they cause. The computer not only tells the children about problems such as erosion below the dam and receding coastlines but also shows them what happens with the graphics.

Another section of the program deals with urbanization and its effects on surface and groundwater. The children learn about the problems caused by thermal pollution from certain industries as well as sewage dumping from cities.

Firsthand Evidence

The 4-H program, though, is not limited to computers. Children also focus on the camp's own water system and the different resources of each camp location.

The counselors lead discussions at the camp's pond or stream to let the campers see firsthand the water source and the creatures living in it. Whaples says, "The campers study where the water comes from along with its distribution and disposal. We want them to know that it doesn't just come from a faucet."

Last summer the program was pilot tested at three 4-H camps in Vermont. Marek and Whaples visited the camps to observe how the program was being presented and received. They also participated in an evaluation, which elicited a very positive response.

4-H youth increase their knowledge about water resources through a special computer program developed by Extension at the University of Vermont.

"The curriculum is being refined for this summer," Whaples says. "It will not cover as much material as last summer, so the campers can learn more about specific aspects. The instructors are also being encouraged to use their individual water sites more to keep the children actively involved."

And the focus will be on the older campers. "We're getting into science and scientific processes, so it should be geared towards the older kids," Whaples explains.

In addition to the hands-on experiences and the computer program, the 4-H water conservation curriculum includes a teacher's manual and audio-visual support materials, such as videos on groundwater and surface water.

Both Whaples and Marek agree that water conservation is something that every child should learn about. As Marek explains, "Children will become the decisionmakers of the future so they have to know how to protect our national resources." ▲

Sharon Gaudin
Extension, Editorial Assistant,
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When Counties Take The Initiative

Larry A. Etkin
Extension Writer and Editor,
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Nearly every state in the Nation is paying attention to water quality. Research centers are popping up in major universities. Commissions are compiling studies. Agencies are analyzing progress. And water quality disasters, like last January's million-gallon oil spill into the Monongahela and Ohio rivers, grab media attention.

Most localities, though not content with their water quality situation, seem resigned to wait until state governments or Extension Service programs "trickle down" to their level. But three Minnesota counties aren't waiting. They've begun their own rural water quality project, monitoring for bacterial and agricultural chemical contamination in local water supplies.

Martin, and Watonwan counties, on their own initiative, and with widespread voluntary cooperation from farm operators, have devised an ambitious project known as WATER (Water-quality Assessment Through Education and Research).

"There just isn't enough government money available," says Watonwan County Extension Committee Chair Lila Evers. "A lot of people in our county realize that we can do some of this on our own. If we can get some government help, we'll be able to do that much more."

The project was developed jointly by the three counties' Extension Service staffs, Soil Conservation Service district conservationists, and representatives of the Soil and Water Conservation Districts. WATER also has access to the University of Minnesota's Center for Agricultural Impacts on Water Quality. A $9,300 grant awarded by the Southeastern Minnesota Initiative Fund assists the project.

Education And Water Testing

WATER educates rural residents about the potential for water quality damage inherent in both the use of agricultural chemicals and the presence of livestock operations. It also includes comprehensive county-wide testing of wells for nitrates, bacteria, sulfate, and pesticide contamination, and choosing sites for long-term monitoring.

Educational and testing elements have been linked. To get the program's special reduced water-testing fee, farmers had to attend at least one educational session. And attend they did! The reduced testing fees and the urgency of water quality concerns led to capacity crowds at nearly all the educational sessions. The pesticide scan was a particular incentive. Normally costing about $350, it was made available for $85. In Watonwan County, nearly a quarter of the farm operators participated. County Extension Agent Gary Wyatt noted that every township had at least 10 wells tested.

Dispelling Misconceptions

Most of the tests revealed no contamination. Martin County Extension Agent John Bohnker contrasted those results with public perception. "There's lots of concern out there," he says, "and a lot of misconceptions about where the problems are. Of the 40 wells tested for pesticides and nitrates, only one sample came up positive, and that was a surface water source.

"It was also reassuring to see that our soil types are permitting pesticides to break down before they cause any problems in our groundwater," Bohnker adds.

Across all three counties, only 8 percent of the wells showed nitrate levels high enough to require treatment (10 parts per million). Fewer than 5 percent showed significant levels of bacteria. Just 16 percent had sulfate readings high enough to affect the taste of the water and to warrant treatment. And only the one Martin County surface water sample showed any contamination from a pesticide.

Educational Content

Each county scheduled two educational sessions. They were led by experts from the Extension Service, Agricultural Experiment Station, and the State Departments of Agriculture and Health. The first session discussed the water cycle and likely paths for contamination, presented current data on water quality, discussed the health significance of home water supplies, and explained basic water sampling procedures.

Session two, about a month later, presented and evaluated the first sampling results and discussed sound soil and chemical management practices for minimizing future contamination risks. The program leaders emphasized the need for proper capping of abandoned wells, and they urged additional water testing.

Postive Evaluations

More than 86 percent of current participants have evaluated the program positively. They say they came away better informed, and they are supportive of the ongoing well-monitoring program. As they outlined their water-quality goals for the coming year, numerous participants said they would pay closer attention to reducing their use of chemicals and their cleaning and maintenance of tanks and other equipment.

Continuing Benefits

Besides the water tests that benefit individual farm operators, the water project is obtaining some long-term information for local and state officials. The project commitee plans to establish at least 10 nitrate monitoring wells in each county. In addition, the project will sponsor at least three well-capping demonstrations during the coming year.

"We're convinced that our continuing water quality education programs will contribute to long-term enhancement of the proper management of soils and chemicals," Wyatt says. ▲

Opposite top: Lila Evers, Watonwan County Extension committee chair, Minnesota, takes a basic water sample before water is sent through treatment equipment. Below: Participants at water quality education session in St. James, Watonwan County, choose from available USDA, EPA, and state publications. Above: At a livestock feedlot in St. James, Layne Evers (left) discusses plans for a manure management system with Gary Wyatt, Watonwan County Extension agent.

Programming For Consumers

Ann T. Lemley
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Richard A. Weismiller
Extension Soil and Water Resource Specialist, Department of Agronomy, University of Maryland

The driving force behind most water issues is the question of drinking water quality. People want safe, clear, good-tasting, odor-free water. They worry about potential contaminants that might cause cancer or other diseases. They want to know if there are radon problems with their well water. They want to know what standards apply to public water supplies.

They have concerns about getting private water supplies tested and how to find a reputable, certified, testing laboratory. They have questions about treatment systems being sold by phone or door-to-door. Extension has a unique opportunity to reach individuals, families, and communities with the information they want about the health effects, testing, and treatment of drinking water.

Program Objectives
Cornell University and the University of Maryland, with funding from the Extension Service, are addressing those critical topics in educational materials designed to meet several objectives:

• To improve public knowledge of chemicals, health effects, water-testing, and treatment methods;

• To provide people with skills to make decisions about drinking-water contamination and managing the risks involved; and

• To forge a working relationship between local Cooperative Extension staff and other professionals concerned with water issues.

The materials generated by this joint effort so far include three slide sets (health effects of drinking-water contaminants, water-testing methods, and water treatment) and fact sheets to support the slide sets.

A separate Cornell project, funded by the Ford Foundation interactive computer program on understanding chemicals, "Toxicology and Public Health: Understanding Chemical Exposure," was designed to help those who as part of their work must understand the health effects of chemicals and consider the implications of toxic chemicals.

The program requires no previous computer experience and allows busy, self-directed professionals to learn accurate, concise information in an informal manner.

Development And Testing
As the slide sets and fact sheets were being developed, they were tested with many audiences. An early version of a script on health effects of drinking water contaminants, for example, was used as part of an agent inservice training program for Ohio Extension agents.

All three slide sets were presented to varied New York groups: community leaders, local health officials, rural people with private wells, suburban people with private or public water supplies, water, testing and treatment vendors, and Extension agents in all program areas.

Comments from the participants and observations of the trainers led to further development of the materials, which then were reviewed by technical professionals in toxicology and engineering and by Extension programming experts. A University of Maryland media specialist was responsible for ensuring that the materials would communicate effectively with the intended audiences.

The interactive computer program was tested with technical professionals as part of a Cornell groundwater course. It was also used during inservice training for New York Extension agents.

Introducing The Materials
The new materials were introduced in Washington, D.C. at the National Workshop on Water Quality in February 1988, along with four *Water Treatment Notes* produced at Cornell and other complementary fact sheets from the University of Maryland.

The developers suggested that the materials be used as part of county regional workshops for well drillers, local health and environmental officials, and Cooperative Extension staff. The workshops could be accompanied by a product fair sponsored by testing and treatment vendors.

Proposed topics for the workshops included:

- The basics of hydrology,
- Proper well development,
- Health effects of drinking-water contaminants,
- Testing and treatment of water.

The interactive computer program was available for use during the national workshop. Since then, it has been used by Extension agents in New York as a major part of a 2-day indepth course, Understanding Chemicals.

Achieving The Objectives
The development and distribution of these educational materials on water quality has provided Extension with the tools for achieving the objectives set forth in the beginning of the project. As the materials are used with more audiences and in other parts of the Nation, they will be closely evaluated to assess their value in improving public knowledge, fostering decisionmaking skills, and helping Extension staffs develop closer working relationships with other professionals who are concerned with water quality. ▲

The Groundwater Gurus

From a homeowner's contaminated well to an entire county's groundwater management plan, Wisconsin's local officials face a bewildering variety of groundwater problems.

Where can these officials turn for advice and assistance on groundwater quality and management issues? Extension at University of Wisconsin, a familiar source of assistance to local governments, continues to provide answers. The Central Wisconsin Groundwater Center, established in 1985 with state funding, serves individuals as a central source of information and education on groundwater issues and provides technical assistance to local units of government.

In central Wisconsin, groundwater contamination problems have been recognized for several decades. The area's combination of sandy soils and a high water table makes it susceptible to contaminants from agricultural activities, residences, and businesses.

Focus On Local Solutions

The Center's philosophy is that many environmental issues, including groundwater, have aspects that can best be handled at the local level. The officials understand the needs of their constituents and their local finances better than anyone else. Center assistance focuses on providing assistance to appropriate groups in each community. The authors' experiences with groundwater problems in Minnesota and Montana have convinced them that local governments have the potential to work toward local solutions with the right kind of assistance.

Staff member Michael Bohn provides the Center with data collection and management from the Wisconsin Geological and Natural History Survey (WGNHS) located in Madison. With the development of a computerized database on groundwater quality from central Wisconsin counties, specialists at the Center are trying to find the right data, place it in the hands of local officials who need it, and help them interpret it, author Osborne points out.

Much of the data is collected during drinking water education programs in which residents of a targeted geographic area are invited to test their water at the Environmental Task Force Lab at Stevens Point. Then the residents participate in an educational program in which they are taught the significance of their individual water quality results and the relationships between land use, geology, and water quality in their community.

The database also contains water quality information for other samples collected by homeowners. Many homeowners received their sampling kits through their county Extension offices as part of a Center project called The Regional Laboratory. Groundwater quality reports for 1987 data are currently being prepared for presentation to participating counties.

Statewide Expertise

The staff has access to the expertise of other groundwater specialists statewide, including the Wisconsin Geological And Natural History Survey. In addition, other Extension specialists at the University of Wisconsin's Madison, River Falls, and Superior locations provide groundwater assistance in areas not routinely visited by authors Mechenich and Osborne.

Currently, Osborne is working with officials from the town of Hull in Portage County to analyze and interpret data from a groundwater monitoring project initiated there after a drinking water education program. The town officials want to prevent small problems from becoming larger, more costly ones.

Special Plans

Groundwater issues have become so pervasive in some central Wisconsin counties that special plans have been made to infuse groundwater protection into other activities of local government.

Marathon County, for example, has recently adopted a groundwater management plan and Portage County is in the process of adopting one. Some of the data used to establish the need for the plans was collected through the efforts of Tom Wilson of Marathon County, and John Leatherman of Portage County, both Extension business and resource development agents of the University of Wisconsin. These agents sponsored drinking water education programs.

These plans combine regulatory approaches at the county level with information and education activities. Examples of activities included in typical groundwater management plans are education for farmers on agricultural BMP's, limitations on septic system density, and designation of wellhead protection areas

Ultimately, Center staff hope to see more central Wisconsin counties begin groundwater management planning. "Since groundwater quality is so closely tied to land use, and since primary responsibility for land use is at the local level," Osborne points out, "it is logical that counties should be the ones to implement groundwater management plans. Citizens may be more responsive to education or regulation that starts at the local level. In any event, when local officials or citizens run into sticky groundwater problems, we are ready to help."▲

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Chris Mechenich
Extension Groundwater Education Specialist, and
Thomas Osborne
Director, Central Wisconsin Groundwater Center, Stevens Point, Wisconsin

Thomas Osborne, director, Central Wisconsin Groundwater Center, examines computer printout with co-worker Chris Mechenich, Extension groundwater education specialist, to assist local government official with a groundwater management problem.

Greener Pastures ...Cleaner Water

Michael T. Olohan
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Farmers in Monmouth County, New Jersey, are implementing measures to prevent the loss of soil nutrients and to keep their farms from being a source of bacterial contamination of waterways. Soil testing and conservation planning are the proven tools that are helping them keep nutrients in place, cut fertilizer costs, and save money.

Mobile Laboratory
Lowering farmers' fertilizer costs, enhancing crop production with fewer chemicals, and reducing agricultural nonpoint-source pollution are the aims of a mobile nutrient testing laboratory operated by Pennsylvania's Department of Environmental Resources (DER). The laboratory tests soil and manure samples to determine the nutrient application rates that will enhance crop production and help prevent nonpoint bacterial pollution from farms.

The laboratory was the chief attraction in a series of programs in Monmouth County's 95-square-mile Navesink River watershed. The educational and informational programs were designed to inform farmers, public officials, and local residents about simple, inexpensive ways to save money and prevent or reduce existing and potential nonpoint sources of pollution.

Interagency Effort
The water quality programs were sponsored by the interagency Navesink River Water Quality Improvement Project. Begun in 1986, the 15-agency cooperative effort works voluntarily to reduce and prevent existing and potential "nonpoint sources" of pollution (diffuse, not easily controlled sources such as stormwater runoff) from further degrading two vital waterways—the Navesink River's 2,622-acre shellfish estuary and the 2.6-billion-gallon Swimming River Reservoir, a drinking water source for 250,000 Monmouth County residents.

Nutrient Management
"Nutrients are to crops as yeast is to bread," said Greg Westfall, Soil Conservation Service district conservationist. "The application of excess nutrients, however, costs the farmer dollars and may cause pollution. That's what we're trying to prevent by educating farmers about the economics of nutrient management on farms."

County agricultural officials estimate that 50 percent of Monmouth County farmers use soil testing to apply fertilizers correctly. Richard Obal, Extension agricultural agent, says most county farmers use chemical

Robert Gaestel, New Jersey farmer, who was instrumental in the construction of the first horse manure composting facility in that state, addresses audience at groundbreaking ceremony. The composting facility was designed to be a viable alternative to chemical fertilizers.

fertilizers instead of composted horse or livestock manures because chemical fertilizers are more convenient, easier to apply, and less bulky, and many farmers do not have manure-spreading equipment. He points out, however, that composted manure was used widely before World War II in Monmouth County and is still a viable alternative for farmers to consider.

Horse Manure Composting
Farmer Robert Gaestel is constructing New Jersey's first horse manure composting facility. Navesink project officials view the facility as a much-needed outlet for the mounting piles of horse manure contributing bacterial contamination to the watershed.

In addition, the new facility will turn horse manure into a nutrient-rich soil conditioner that will improve soil structure, reduce soil erosion potential, support beneficial soil organisms, reduce chemical fertilizer use, cut fertilizer costs, and enhance the long-term productivity of the soil.

The composting operation may receive up to 43 percent cost-sharing under the Federal Soil Conservation Service (SCS) Navesink Watershed Plan, which was begun in 1985 to promote the installation of soil and water conservation practices.

The 79- by 24-foot composting facility, designed by SCS engineers with assistance from Rutgers University researchers, will handle the manure from 429 horses. Gaestel plans to sell the composted manure to landscapers and contractors. About 40 to 50 percent of the watershed's horse waste is picked up regularly by manure haulers serving Pennsylvania's mushroom farmers. Gaestel's facility will handle another 10 percent, leaving about 9;840 tons unremoved each year.

Impact On Shellfishing
"The water is very close to being opened for shellfish harvesting," says Project Manager Horzepa, who is also chief of the Bureau of Water Resources Management Planning in the New Jersey Department of Environmental Protection (DEP). "When it rains, the bacteria count in the river goes up. We're attempting to get pollution control when it rains."

"Gaestel's facility may help to lower the price of shellfish, or at least make it more plentiful and make New Jersey's shellfish industry viable again," says Michael Ferguson, a member of the local environmental commission. ▲

Home Front Attack On Water Pollution

Virginia Cooperative Extension Service (VCES) home economists are playing a singificant role in helping Virginia households fight water pollution. They are conducting needed research providing research-based data to help formulate public policy and disseminate research-based information to consumers.

Water-quality problems in the Chesapeake Bay and other bodies of water in Virginia have occurred, in part, as a result of enrichment from the nutrient phosphorus. This situation caused the state's public policymakers to investigate alternative strategies for controlling unwanted nutrients

One source of phosphorus is home laundering effluent that is processed through wastewater treatment plants and poorly functioning septic systems. One study has estimated that use of nonphosphate detergents could reduce the phosphorous loadings from municipal point sources in the Chesapeake Bay tributaries by about 25 percent.

Legislation to prohibit the sale and use of detergents having more than 0.5 percent phosphorus was discussed by the Virginia General Assembly in 1985 and 1986 and finally enacted in 1987 to become effective January 1, 1988.

Cost-Benefit Study

VCES home economists became involved in the issue of banning phosphate laundry detergents about 3 years before the law was passed. In 1984, the authors served on a five-member Virginia Senate task force to study the costs and benefits of such a ban.

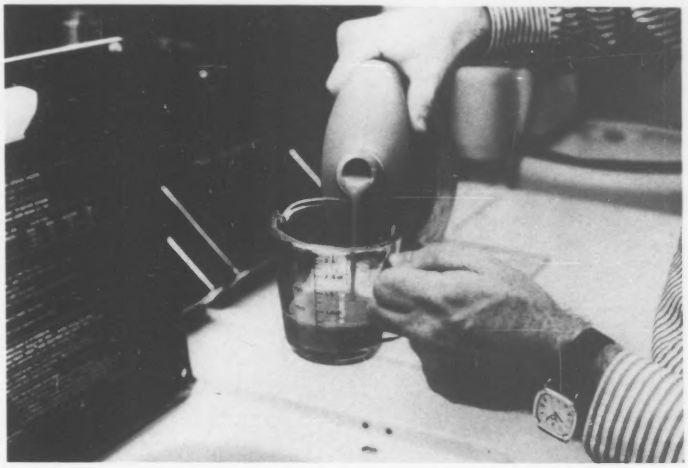
Other members of the task force represented the State Water Control Board, the Chesapeake Bay Commission, and the Virginia Soil and Water Conservation Commission. The study focused on the impact on consumers as well as on the water quality aspect.

As the task force reviewed research related to the use of nonphosphate laundry detergents and the impact that a ban would have on consumers, it became evident that new research was needed.

Because about two-thirds of Virginia citizens live in soft-water areas, a chief problem was the absence of studies dealing with the use of nonphosphate laundry detergents in soft water. This need led to a joint Extension-research request for a project to obtain the needed data.

The 1-year project received about $18,000 from the Virginia Water Resources Research Center and the Virginia Tech Department of Housing, Interior Design, and Resource Management.

Conducted in the university's household equipment laboratory, the project compared the performance of three types of laundry detergents—phosphate-built powder, carbonate-built powder, and unbuilt liquid—in both soft and hard water.



As the Virginia legislators deliberated about the proposed ban, the VCES home economists shared periodic progress reports about the research with key senators. Thus, research-based information was made available to policymakers in a timely manner.

Extension Educational Programs

The results of the laboratory research project have been used as part of workshops to help home economics Extension agents increase their knowledge about nonphosphate laundry detergents. Several VCES educational programs designed for consumers have been used widely by Extension agents and volunteer leaders.

Educational materials that Extension has developed include

- "What, No Phosphates?"—a slide program with a continuous-loop cassette audiotape, for use at exhibits.

- Two fact sheets: "*Shopper's Guide: Nonphosphate Laundry Detergents*," and "*Using Nonphosphate Laundry Detergents*."

Extension home economists throughout the state also have presented consumer information on nonphosphate laundry detergents through television, radio, newspapers, and newsletters.

The State Agricultural Experiment Station funded an Extension-research request for a project designed to help identify what changes, if any, have occurred in home laundry practices and consumer satisfaction since the law went into effect. The results will be used in future Extension programs and will be available for reference when impact of the policy is reviewed. ▲

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Researcher at Virginia Tech, Blacksburg, prepares to test laundry detergent for phosphorous. Detergents containing more than 0.5 percent phosphorous—a contributor to water quality problems in Chesapeake Bay—can no longer be sold in Virginia.

Preserving A Valued Resource

Robert Neumann
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East Lansing

People in Michigan like to boast that their state leads the Nation in renewable freshwater resources. They are proud of their 3,288 miles of shoreline, 36,350 miles of rivers and streams, 35,000 inland lakes, and more than 150 waterfalls.

The Michigan Cooperative Extension Service is helping citizens identify and solve water quality problems so that this resource can continue to be a valuable economic and social asset. Preserving water quality and minimizing contamination problems have always been Extension goals. The formal water quality (WQ) program, however, did not begin until 1985.

Water Quality Committee

The WQ program has a permanent committee of 12 members—campus-based specialists and field staff members from the four Extension program areas and three subcommittees. They work in specific areas such as animal waste handling, crop and soil management, and nonagricultural areas including community and household waste management and disposal.

Extension's WQ programs have led to interagency coalitions and joint educational programs with Michigan's Departments of Agriculture, Public Health, and Natural Resources. And Extension has conducted field staff training

in cooperation with the Michigan Soil Conservation Service and the Soil Conservation Districts.

Extension has developed more than 20 new publications dealing with topics such as phosphorus, nitrogen, and soil sediment management; solid waste handling; environmental hazards associated with underground storage tanks; and crop irrigation. A newsletter keeps WQ committee members, field staff, and others up to date on new educational projects and issues.

Animal Waste Handling Standards

The program has attracted wide interest among communities. At times, interest stems from specific issues, such as the state's proposed animal waste handling standard. When the first draft touched off a political explosion, Extension was directed to develop interim guidelines.

Working with representatives from Michigan's agricultural industry and the Soil Conservation Service, WQ program members helped write the guidelines and then reviewed them in 17 regional meetings for farmers and other citizens.

Although the matter remains far from being resolved, the Extension team continues to play an important role in developing an effective water quality protection standard for Michigan agriculture.

Community Assistance

Another program for small local government units is the Community Assistance Program for Environmental Toxicology (CAPET), developed by WQ members in MSU's Center for Environmental Toxicology.

Funded by the C.S. Mott Foundation, CAPET is working with a few small communities (population 1,500 or fewer) that cannot by themselves afford to solve contamination problems. Eckhart Dersch, MSU Extension specialist and professor of resource development, organized the program so that these communities would have access to campus-based experts in such areas as toxicology, groundwater flow, waste disposal, and environmental law.

"Ideally, we like to be involved as soon as the community recognizes its problems and before sides are chosen and important decisions are made," Dersch says. "We can't solve their problems, but we can help them to move as quickly as possible toward a rational list of options.

Groundwater Quality

An example of Extension's broader outreach is the Tri-County Groundwater Meeting, which attracted about 250 civic and governmental officials from three southwestern Michigan counties in June 1987. The 1-day program, which explored known and suspected groundwater quality problems, was coordinated by Dersch; Harvey Liss, Extension program leader at KBS; and Dean Solomon, district Extension leader for natural resources and public policy.

The county Extension directors—Bill Plummer in Calhoun, Jan Hartough in Barry, and George Mansell in Allegan—used a survey to identify the discussion topics that would be of most interest to their county residents. Groundwater experts from MSU, state and county government, and nearby Western Michigan University at Kalamazoo were the featured speakers.

The session included the formation of "county huddles" in which community members worked with Extension facilitators to identify local problems and make plans for handling them. These groups have continued to function in the counties under the guidance of the local Extension directors.

Groundwater Task Force

The ability of community leaders to develop an action-oriented focus on local water quality issues will be further enhanced by the Groundwater Task Force that was created recently by the College of Agriculture and Natural Resources.

Task force members represent the Agricultural Experiment Station, the Cooperative Extension Service, and water quality preservation interests outside the university. The group's main job will be to help identify, coordinate, and channel resources to communities that need expertise in groundwater enhancement and preservation.

Education For Action

Communities will find additional assistance through the new Groundwater Education in Michigan (GEM) program. GEM was launched by the W.K. Kellogg Foundation in collaboration with the Institute of Water Research at MSU. It is a comprehensive effort to encourage communities to develop local action-oriented groundwater protection projects.

Its purposes are to increase public awareness and understanding of the groundwater resource, to promote individual and broad community involvement in developing groundwater protection initiatives, and to emphasize the use of pollution prevention strategies in individual and community behavior, including policy development.

All of these efforts together form a broad and potentially effective network intended to maintain Michigan's national reputation for its vast quantity and high quality of water resources. ▲

The Enemy Within: Hazardous Waste From Homes

Elaine Andrews
Extension Environmental Education Specialist, Environmental Resources Center, University of Wisconsin, Madison

"We have met the enemy, and he is us!" Ever since the 1960's, Pogo's famous phrase has been applied to myriad environmental problems. Never has it been more true than when used to describe the impact of hazardous wastes from homes. Since World War II, improved technical understanding of chemicals, fueled by consumer demands, has led to increased use of hazardous chemicals in household products.

Not only have these chemicals created a need for more home safety education, but also their disposal has contributed to both solid waste and water quality problems. Our ignorance of chemical hazards, coupled with the carelessness of our "throwaway society," has come back to haunt us with toxic substances in our drinking water.

What Is Extension's Role?
It is not easy to quantify the impact of improper disposal of household hazardous waste. The extent of the problem will undoubtedly be clear to future generations, thanks to the leaking landfills and other domestic pollution sources that we will leave them.

Wisconsin has found qualitative evidence of the impact of domestic wastes, such as well water contamination in locations where there has been little or no opportunity for industrial or agricultural impact. These findings provide corroboration for similar evidence from New York, Massachusetts, Minnesota, and Washington.

But other point and nonpoint sources of toxic contaminants may be a greater risk to health and the environment than improper disposal of household hazardous waste. Extension specialists and county agents must determine the best use of their scarce time and financial resources. Should educational material development and training time be devoted to the subject of household hazardous waste, or would it be better spent on other groundwater contamination issues?

The Teachable Moment
The answer is: It depends on the needs and interests of the local people. In Wisconsin, proper disposal of household hazardous waste has captured the imagination of the general public, health officials, solid waste managers, and landfill owners and operators. In effect, the 1980's have become the "teachable moment" for information about toxic substances.

Interpreting the complexities of toxic substance risk management is a formidable task. But the hazard of household wastes is something everyone can understand to some degree. Better yet, behaviors learned in relationship to household hazardous waste disposal can be transferred to community decisionmaking concerning management of other hazardous wastes and toxic substances.

In Wisconsin we know the "teachable moment" has arrived because of the depth of interest and the response. As of December 1987, 14 Wisconsin communities had sponsored 26 household hazardous waste collection programs. County Extension resource agents were heavily involved in four of these programs.

Resource agents, agriculture agents, and home economists have been involved in providing information, organizing public meetings, offering leader training programs, and finding ways to coordinate household hazardous waste disposal techniques with other difficult-to-dispose-of hazardous wastes in approximately one-third of Wisconsin's counties.

Managers, legislators, and educators from more than half of the state's 72 counties have contacted the university Extension environmental education specialist for information or assistance concerning disposal of hazardous wastes from homes or have attended short courses, workshops, or lectures.

Extension Provides Leadership
The University of Wisconsin Extension Environmental Resources Center (ERC) has provided state leadership in household hazardous waste education and management. ERC serves as a "clearinghouse" of scientifically accepted information and facilitates local and county program development. County Extension faculty identify program needs.

ERC informs agents of issues and resource availability; develops additional educational materials and resources; works cooperatively with state agencies to gain review, acceptance, and use of educational materials; and develops specialized educational programs for client groups who do not fall into the county agent network.

Educational Methods
Wisconsin's program has used a variety of methods to accomplish its educational goals:

- Using grant funds to purchase audiovisual materials for use by agents and specialists.

- Developing supplementary audiovisual materials with the cooperation of other state agencies and "in-kind" contributions from a private television station.

- Developing and publicizing a variety of educational and training materials appropriate for the general public.

- Collecting and publicizing print materials contributed to the Wisconsin Extension library by other states.

- Offering a variety of educational talks, workshops, and credit courses, coordinated through county Extension faculty and University Outreach. ▲

A Public Policy For Groundwater

Cheryl K. Contant
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Groundwater contamination stemming from agricultural sources has become a major focus of governmental efforts and public concern. The Extension Service can be a vital link between governmental policies in this area and the farmers whose agricultural practices are affected by those policies.

This study sampled Iowa farmers to learn their views on five alternative solutions to groundwater problems. Although the farming community is only one of the groups with valid and important views about agriculturally related groundwater problems, farmers' attitudes are critical to Extension because farmers are the primary users of Extension's information and education programs.

Groundwater Policies
Five policies presented to Iowa Farmers in the study are listed below in an order that assumes an increasing level of Extension Service involvement and, coincidentally, an increased level of expected protection of groundwater quality.

Industry Self-Regulation With Goverment Monitoring
This policy relies on industry and agriculture to regulate their own activities to best serve the public interest. Governmental involvement would include monitoring groundwater supplies and publishing estimates of the health risks from contaminant exposure or ingestion. This policy probably would result in relaxing some existing licensing and regulatory requirements. Overall groundwater quality would be expected to decline.

Groundwater Use Linked to Level of Contamination
Under this policy, various groundwater uses (industrial, irrigation, drinking water, etc) would be identified, along with acceptable contamination levels for each use. Under governmental regulations, groundwater sources serving each use would be allowed to become contaminated up to the established level for that use. Extension probably would be involved in identifying present and future groundwater uses and in coordinating groundwater usage with appropriate water supplies.

Human-Health-Based Standards
Maximum allowable contamination levels for groundwater supplies would be set according to acceptable risk levels for protection of human health. Typically, acceptable risk levels are set so that a lifetime (70 years) of drinking water at the maximum allowable concentration would increase the average death rate by no more than one additional death out of one million people. This policy would allow "reasonable" levels of groundwater contamination to occur without undue health risks. Governmental enforcement action would be necessary only when health-based standards were exceeded.

Barring Further Degradation of Groundwater
This policy would seek to prevent any additional contamination of groundwater The government would take such actions as banning the use of some farm chemicals or restricting the application rates of others.

Provision of Pure Groundwater Supplies
A "groundwater purity" policy would require the most stringent constraints, not only to prevent further contamination, but also to clean up groundwater resources so that no artifical compounds imposing a health risk would be detectable. Governmental action might include strict regulatory requirements in chemical registration programs, and forced reductions in the use of existing chemicals.

Iowa Farmers' Opinions
This study asked a small statistically based sample of Iowa farmers to answer questions about the feasibility and desirability of each of these policy options.

The responses indicate a serious concern about the quality of groundwater resources and a desire for governmental action. The policies promoting the highest levels of groundwater protection were viewed as almost twice as desirable as less stringent approaches.

Consideration of the feasibility of these policies, however, tempered, farmers' desire for maximum groundwater protection. The policies promoting no further degradation or use of health-based standards were considered the best choice.

Insights For Extension
These survey results should provide insights for the Extension Service. Farmers seem to recognize the severity and importance of groundwater contamination. They want groundwater protection even if agricultural changes become necessary. They understand that the economic and technical feasibility of various policies may limit the amount of protection possible. And they view government involvement as desirable and necessary to aid in the farming transitions necessary to achieve groundwater protection. These interpretations point to a legitimate and active role for Extension.

Farmers use, prefer, and rely on information from their county Extension agent, agricultural experiment station, or university Extension specialists. This confidence places a significant burden on Extension to provide accurate, complete, and valid information to guide farmers in altering their operations to protect groundwater.

Understanding the attitudes of farmers on these issues will help Extension fulfill its role as a vital link between farming practices and groundwater quality protection. ▲

Water Quality— An Oregon Enterprise

Hugh J. Hansen
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Corvallis

Lenore Paulsen, Douglas County Extension home economics agent, Oregon, samples a glass of "quality" drinking water poured by Gerry Meyer, Douglas County sanitarian.

During the early 1980s, to plan and implement the Tillamook Bay Rural Clean Water Project, the Oregon State University Extension Service worked in cooperation with seven other agencies: Tillamook County Soil and Water Conservation District, Tillamook County Creamery Association, Tillamook Bay Water Quality Committee, Oregon Department of Agriculture, Oregon Department of Environmental Quality, USDA's Agricultural Stabilization and Conservation Service, and the Soil Conservation Service.

Interdisciplinary Initiative

More recently, Extension agents, specialists, and administrators have developed a statewide Extension interdisciplinary initiative in water quality. In 1987-88, the first year of the initiative, the focus has been on development of teaching and resource materials related to water quality for domestic use.

Leadership in development of a county Extension office reference notebook on this topic and accompanying agent training has been provided by Hugh J. Hansen, Extension agricultural engineer; Mary Ann Sward, Extension housing specialist, and James A. Vomocil, Extension soil scientist, Oregon State University.

Two inservice training workshops have been conducted to familiarize at least one agent assigned water quality responsibilities in each of the state's 39 county Extension offices. A series of nine fact sheets focusing on domestic water quality issues and concerns are being authored by the three specialists involved. The training and resource materials are geared for use in interdisciplinary programming efforts at the county level.

The primary goal of the initiative is to increase water quality awareness of Oregonians by 50 percent. In addition, the quality of domestic water will be improved for at least one-third of Oregon's 673,000 family units presently using domestic water sources of unknown or questionable quality.

Focus On Agriculture

The remaining 3 years of the initiative will address water quality issues related to agriculture. The program will develop additional agent reference notebooks, inservice agent training, and supporting fact sheets for public distribution. The agents and specialists working on the water quality initiative are coordinating efforts with another OSU Extension interdisciplinary group focusing on the management of Oregon's wetlands and riparian zones as related to the state's forestry, agricultural, fishing and recreation industries. ▲

4-H Goes Aquatic!

As participants arrived at Jamestown 4-H Center in Williamsburg, Virginia on that hot, August afternoon, expectations for an exciting week were building. The fourth annual Senior 4-H Marine/Aquatic Leadership Camp was about to begin.

The need for youth to increase their awareness and understanding of water-related issues is great. Threats to the quality of water and general environmental deterioration pose serious problems for present and future generations. Because of this threat, it is the goal of the 4-H Marine/Aquatic Educational Program that youth develop a sincere appreciation for and dedication to conserving water resources.

Camp Objectives
To meet the needs of senior 4-H youth, the camp provides leadership training in environmental education. Participants from across the state are selected by their interest and involvement in environmental issues and activities. During the camp week, they take part in workshops, tours, and field study sessions to learn firsthand about water resource issues.

Major objectives of the camp provide youth the opportunity to: 1) gain additional knowledge, skills, and positive attitudes about water-related resources; 2) develop leadership skills in environmental education; and 3) become familiar with environment-related resources and careers.

Originating from an earlier pilot program (see Extension Review, Summer, 1986), the camp has become a statewide model for environmental education programming.

Major funding for this program was provided through the National Science Foundation. The National Science Foundation grant also supports three additional 4-H programs: 4-H Marine Project publications, Adult Volunteer Leader Training, and a Special Marine Camp for Disabled Youth. In addition, scholarship funds are provided by the Virginia Sea Grant Program.

Camp Kickoff
Inspiring guest speakers are used to kick off the program. Ed Clark of the Virginia Wildlife Rehabilitation made a hit with campers and staff alike. With a live hawk, owl, and young fox in hand, Clark convinced his audience that public awareness and concern are necessary to save wildlife populations for the future.

As director of the Center, Clark's message emphasized that wildlife species are a valuable resource not to be taken for granted.

Guest speakers for previous camps included the late Captain Alex Kellam, retired Chesapeake waterman. As a tribute to him for his lasting impact on 4-H'ers, our camp is dedicated to his memory.

Program Variety
The first full day of camp offered a smorgasbord of workshops: wind surfing, seafood cookery, decoy carving, and CPR training were some of the hands-on learning experiences.

A choice of four, two-day field trips offered programs in maritime history and coastal development, barrier island ecology, industrial and commercial use of water resources, and estuarine ecology.

Virginia has a wealth of programming resources including The Mariners' and Virginia Marine Science Museums, Chesapeake Bay Foundation, Commission of Game and Inland Fisheries, Naval Bases, and state and federal refuges. Using such resources outside Extension not only expands program support but also benefits the resource provider by offering greater audience potential. Developing good resource contacts is a must for this type of program.

"What's in this net?" Barry W. Fox (left), 4-H Extension specialist, marine education, instructs 4-H'ers in fishery biology at the 4-H Marine/Aquatic Leadership Camp in Willamsburg, Virginia.

Leadership Training
A major emphasis of Marine Camp is leadership development. Early in the week campers selected specific topics for which they would develop presentations.

Winding Down
Excellent performances demand recognition, and several awards categories were used to recognize high achievers. With this, and the closing campfire, the reality came that camp was almost over.

In its aftermath, one can ask if all the planning, phone calls, letters, worry, and work were worth the effort. One 4-H agent told me that her "4-H Marine Camper came back a different person, and for the first time is taking on many leadership roles in her own 4-H program." ▲

Barry W. Fox
Extension Specialist, 4-H Marine Education
Virginia Tech, Blacksburg

Clearinghouse For Quality

Daniel H. Walters
Former Director,
Technology Division,
National Small Flows
Clearinghouse,
U.S. Environmental
Protection Agency

The septic tank systems commonly used in rural areas and small communities are the leading contributor to the total volume of wastewater discharged directly into the soil. The nearly 23 million such systems in the United States treat and discharge almost 3 billion gallons of wastewater every day.

The settled and floating residue that remains in septic tanks, if pumped out every 3 to 5 years as recommended, would amount to more than 4 billion gallons of waste to be managed, treated, and disposed of each year. When septic systems are located on unsuitable soil or are poorly designed and constructed or inadequately maintained, the usual results are system failure and public health threats.

Many areas that have sewage treatment plants have problems also. A recent survey estimated that 2,000 small community treatment plants are not meeting effluent discharge requirements. About $2.5 billion would be needed to upgrade these facilities.

Communities Need Support
To resolve their wastewater problems, local officials of small communities and rural areas must be able to call upon all available resources for financial, technical, and managerial support.

The U.S. Environmental Protection Agency has established an information clearinghouse that can directly assist local officials and also support the institutions that work with them. And it can deliver technical information to consultants, advisory groups, assistance agencies, and contractors who are working with small communities and rural governments.

Wastewater Information Center
The 1977 Clean Water Act directed EPA to establish a national center for information related to wastewater systems and wastewater management strategies appropriate for small communities and rural areas. In 1979, EPA established the National Small Flows Clearinghouse at West Virginia University.

The three major objectives of the clearinghouse are:

- To provide information and assistance so that small communities can make sound wastewater decisions;

- To enhance the capabilities of the EPA regions and the states to assist small communities through the development of outreach programs; and

- To equip the technical community with the technological information it needs in order to accelerate the development and application of innovative technologies appropriate for small communities.

Clearinghouse Publications
The clearinghouse publishes two periodicals to further these goals. *Small Flows* serves the technical community with articles spotlighting

technologies, operation and maintenance, case studies, and people and institutions actively involved in small-flow technology. It also includes information about new publications, a calendar of events, and an order form detailing clearinghouse products and services such as design modules, case studies, videos, and EPA publications and databases.

The second publication, *Managing Small Flows*, addresses the same topics, but in a different way. Aimed at local officials, it gives decisionmakers the facts without being too technical. In addition, it discusses finance and management and emphasizes the "self-help" concept. Information about outreach agencies and important publications for local officials is an integral part of this publication.

Assistance For Outreach
The clearinghouse is supplying support and limited funding to states for efforts to develop outreach capabilities in the area of wastewater management. It works with the Cooperative Extension Service, the National Association of Regional Councils, Rural Community Assistance Programs, and others in delivering wastewater information to small communities.

By calling a toll-free number (800-624-8301), interested persons can request information, publications, and referrals and can be put on the mailing list for the two clearinghouse periodicals. Written requests should be addressed to: EPA National Small Flows Clearinghouse, P.O. Box 6064, West Virginia University, Morgantown, West Virginia 26505-6064. ▲

Identifying Pollution Risks

Mike Bohn and Gary Jackson Extension Water Quality Specialists, University of Wisconsin, Madison

An interagency, interdisciplinary project in central Wisconsin is developing a geographic information system (GIS) that will help individuals and local governments predict the effect of their land management decisions on the quality of local groundwater.

GIS is a computerized approach to analyzing and managing spatial data such as land uses, population, soils, geology, and water quality. It enables users to retrieve and combine data to create maps that reveal patterns useful in resource and land use planning.

The goal of the central Wisconsin GIS is to develop a system that can be used on existing personal computers to identify areas of highest groundwater pollution risk so that Extension can target those areas with information and education on the nature of the problem and help them take corrective or preventive actions.

Benefits Of A GIS

The GIS could be used, for example, to develop better recommendations for fertilizer and pesticide application rates on a farm field or other land management unit. Soil characteristics, geologic and hydrologic data, and past cropping history all should influence the application recommendations.

Factors included in the pilot GIS system include soil organic matter, type of surface geologic materials, depth to water table, depth to bedrock, prior cropping history, prior chemical applications, and irrigation water usage. By evaluating these data to determine the area's pollution vulnerability and then applying chemicals according to established guidelines for various levels of vulnerability, pollution risks can be reduced.

The easily understood GIS graphic output should be a powerful tool for groundwater protection that could be used by crop consultants, farmers, and land management agencies.

Developing A Database

In 1986, Wisconsin Cooperative Extension received a grant from the USDA Extension Service to assess procedures for evaluating farm pollution potential. The original plan was to use existing soil, geologic, and hydrologic information as a basis for assessing the pollution potential of individual farms.

But initial efforts quickly demonstrated that, except for soil survey data, such information is difficult to obtain and generally is not in a form that readily allows it to be used in a farm-specific evaluation. As a result, the pilot project was redirected toward organizing data into a usable format. Extension realized that the project could be accomplished only through substantial cooperation with other agencies.

They found willing cooperators in the Soil Conservation Service's Golden Sands Resource Conservation and Development (RC&D) Project and the Central Wisconsin Groundwater Center. The RC&D project obtained additional funding and expanded its advisory committee.

The expanded committee involves staff from county planning and zoning offices, Soil Conservation Service, Wisconsin Department of Natural Resources, county and state Extension, county land conservation committees, county health office, and the University of Wisconsin at Stevens Point.

Organizing The System

Two key assumptions in organizing the GIS are that agencies will share their data and that they will be willing to collect and organize data in formats usable on personal computers.

Participating groups maintain custody of their own data, but make it available as part of a shared database. The need for standardization of formats and procedures has necessitated extensive technical training for the resource professionals.

Lessons Learned

Before any such system can be operational at the local level for farm-specific use, some significant needs must be met:

- Inexpensive, powerful, government-supported relational database and vector GIS software for personal computers, along with software to facilitate conversion of data to common standards.

- Close coordination among agencies to assure compatibility among different spatial databases.

- Educational materials to familiarize GIS users with the conceptual basis of GIS, how to apply GIS to natural resource problems, and how to collect data with future GIS uses in mind.

Tool For The Future

The federal government is already considering the possibility of regulating agricultural chemical use according to the pollution potential of individual geographic areas. Under such a plan, states probably would have the option of accepting generalized vulnerability ratings developed nationally or performing their own site evaluations.

If more site-specific management recommendations are to be developed at the state and local level, regional geographic information systems like this one will be needed. They will provide a framework that can be used by local government officials, state policymakers, and individual land managers when evaluating the practices or restrictions needed to protect against groundwater pollution. ▲

Solving The Groundwater Quality Puzzle

Edward F. Vitzthum
Associate Coordinator, Environmental Programs, University of Nebraska-Lincoln

Four words are almost certain to capture the attention of federal and state lawmakers, regulatory agencies, researchers, Extension staffs, and most importantly, the people of the United States—*agricultural chemicals in groundwater.*

Nebraskans are especially sensitive to the problem. Groundwater serves domestic water needs for more than 90 percent of the state's population, rural and urban.

Thanks to a $1-million grant from the Burlington Northern Foundation through the University of Nebraska Foundation, a University of Nebraska-Lincoln team of researchers and Extension specialists is seeking some new perspectives on groundwater problems—and, they hope, some solutions.

Interdisciplinary Effort
The Burlington Northern Foundation Water Quality Project was launched in October 1984. The 5-year interdisciplinary research and Extension project—actually six related projects in one—is designed to examine the potential effects of several crop production practices on groundwater quality.

Chemigation Risks
The increasingly widespread use of chemigation was one factor that pointed to the need to protect Nebraska's water quality.

Because it is effective, efficient, and economical, chemigation is steadily gaining popularity.

There are potential drawbacks, however. If the system malfunctions, a chemical can be backsiphoned into the well or can leach into it from a spill. The result can be serious groundwater contamination.

Coping With Contamination
Several practices, including irrigation management, nitrogen management, and integrated pest management, are known to be effective in helping cope with groundwater contamination problems. The research team is seeking to develop new alternatives that will complement these proven practices.

The university's South Central Research and Extension Center (SCREC) has become the principal laboratory for the project. An area of approximately 110 acres has been divided into 180 rectangular main plots, each containing fractionally less than 6 acres. The 2,220-foot diesel-powered linear irrigation system can deliver 1,400 gallons of water per minute from the 2,550-foot-long supply ditch that bisects the project site.

Areas Of Emphasis
The project comprises five research/Extension projects in three broad areas of concern, plus a soil and plant analysis project:

Effectiveness of agricultural chemicals and their movement on and in the soil:

• A study focusing on nitrogen cycling and movement in soil. The study is examining the effects of tillage methods, nitrogen fertilization rates (with and without a nitrification inhibitor), and three different corn hybrids on nitrogen mineralization and the depth of fertilizer movement in soil over time.

• A herbicide-irrigation-tillage (HIT) study. This study is designed to determine the effects and interactions of two different herbicide treatments, two irrigation regimes, and four tillage systems as they relate to both crop production and groundwater quality.

• An insectigation study which parallels the HIT study. Tillage practices, insecticide formulations and application methods, and irrigation water levels are being studied to determine their effects on population of selected insects and on movement of the insecticides through the soil profile.

Blackflow prevention and chemical injection devices:

• A study to evaluate equipment designed to prevent the blackflow of chemicals into the water system and equipment used for chemical injection.

• A study of the aquifer cleanup and restoration methods that would be necessary if chemicals should accidentally backflow into the water system. A harmless tracer solution is injected into an irrigation well to simulate backsiphoning of an agrichemical. Multilevel sampling wells situated at predetermined distances from the irrigation well are used to track movement of the tracer in the aquifer. By pumping the irrigation well, the researchers can determine the percentage of the "contaminant" removed in a given time period.

Soil and tissue sampling:
• The work of the pesticide analytical laboratory in the Department of Weed Science has been designated as a separate subproject. The laboratory provides the extensive analyses of soil and plant tissue samples required in all the projects. Because soil samples must be taken before and after each treatment, the laboratory must process about 4,000 soil samples annually.

The Future Depends On Water
Now in its fourth year, the project is scheduled to continue through the 1989 crop season. The challenge is clear: to preserve the quantity and quality of water for the future while maintaining crop production capacity and profitability. ▲

Putting It All Together

Joe Makuch
Extension Water Quality Specialist, Chesapeake Bay Program, Department of Agricultural Engineering, Penn State University, University Park

Manure can be a valuable farm resource. Spread on cropland properly, it can increase crop production by improving soil structure and providing nutrients. But mismanaged manure can pollute streams and groundwater.

Manure Management for Environmental Protection, a manual published by Pennsylvania's Department of Environmental Resources (DER), is helping farmers obtain maximum benefits from manure while minimizing potential water quality problems. The manual is the result of a major revision project headed by Robert Graves, Penn State professor of agricultural engineering with Extension responsibilities.

The original manual, published in 1977, was oriented primarily toward dairy operations and thus did not adequately reflect the diversity of the State's agriculture. So in addition to a need for updated material in the dairy section, there was a need to add detailed manure management recommendations applicable to swine, poultry, and beef production.

Cooperative Effort

The spark for revising the original manual came in late 1984 from a DER agricultural advisory committee made up of representatives from federal and state agencies, the state's major farm organizations, the legislature, and Penn State. Funding from the Chesapeake Bay Program provided the necessary resources.

As editor, Graves consulted with a manure management work group. The director of natural resources for the Pennsylvania Farmers Association chaired the group, which also included Extension specialists and Soil Conservation Service (SCS) staff, who wrote and technically reviewed the new manual.

Penn State's Agricultural Information Services provided the expertise necessary to ensure that the manual was attractively designed and easy to read and understand. By May 1987, Pennsylvania had a comprehensive, usable reference to help farmers properly manage manure.

The Finished Product

The manual is really eight separate handbooks. Two of them, *Manure Management for Environmental Protection*, and *Field Application of Manure*, cover general areas of manure management, such as construction of manure storage, fly control, and proper application rates.

Separate handbooks cover each major type of livestock operation in Pennsylvania: poultry, swine, veal calf, beef, and dairy. The remaining handbook discusses manure management for horses, sheep, goats, and various small animals. The individual sections are made up of stand-alone fact sheets.

This format offers several advantages over a single, large volume. Farmers can get the handbooks and fact sheets that are specific to their individual operations. At the same time, Extension and other agencies have the complete manual as a reference for the broad range of questions they receive. This format also makes it possible to easily update and reprint separate sections as necessary.

The manual is also available on PENpages, the computerized information retrieval network of the Penn State College of Agriculture. PENpages can be accessed by anyone who has a home computer, modem, and appropriate software.

Getting The Word Out

Extension produced a brochure to inform farmers and others about the new manual and sent news releases to the farm press. Each county Extension Service, SCS office, conservation district, and DER regional office received the complete manual. Five orientation meetings introduced the regional and county staffs to the manual. The orientation sessions also fostered cooperation among the many agencies that work with farmers in manure management.

Using The Manual

"The manual serves as a good starting point for farmers to learn about nutrient management," says Mitch Woodward, Extension regional manure management agent with the Chesapeake Bay Program. "I take copies with me whenever I go on a farm visit. I also send copies of sections as followups to phone calls on manure management." Woodward sees the manual as a valuable tool in the effort to prevent water pollution from agricultural sources.

Another audience for the manual is local government officials. "Especially in areas with both high animal densities and a growing suburban population," says Woodward, "local officials are concerned with what happens when manure is improperly managed. They want to know how to prevent problems with odors, flies, and contaminated drinking water."

Woodward has worked with Graves and others to conduct training sessions for local officials on use of the manure management manual. "The sessions have also served to sensitize them to the realities and challenges that farmers face in properly managing manure," he says.

Putting together the manure management manual required commitment and cooperation from many individuals. But as a result, Pennsylvania farmers, and those who work with them, now have access to a single reference that will help them make better use of a farm resource while protecting water quality. ▲

The Water Sampling Of Clark County

Chris Mechenich
Extension Groundwater Education Specialist, University of Wisconsin Central Wisconson Groundwater Center, Stevens Point
and
Mary Ellen Sjolin
Extension Home Economist, Clark County, Wisconsin

Take 90 Extension homemakers and 15 other community volunteers, add them to the usual mix of local officials and technicians who work on groundwater issues in a county, and an exciting new product emerges. In this case, the product is the Clark County Groundwater Project—a locally supported effort to educate residents about current water quality and options for the future in this north central Wisconsin county. To date, the efforts of the Extension homemaker volunteers have resulted in the collection of approximately 1,400 water samples in a county of 32,000 people and 3,500 farms.

Clark County, Wisconsin's second largest dairying county, is 1,224 square miles of rolling hills and prosperous dairy farms. In late 1984, county conservationist Keith Foye and the Clark County Land Conservation Committee (LCC) became concerned about the lack of groundwater quality data for the county.

Foye contacted Fred Madison, soil scientist with the UWEX-Wisconsin Geological and Natural History Survey. Madison observed that the combination of soil types, geologic factors, and land uses made the county's groundwater potentially susceptible to pollution. But how great was the risk? "We really don't know," Madison says.

Early Samples

In 1985, Arv Dopp, the county agriculture agent, held a drinking water education program for four townships in the county. Residents were invited to collect samples from their private wells on a specified date, using bottles provided by University of Wisconsin's Stevens Point lab. The samples were analysed, and the results mapped. About a month later, an educational program was held to inform residents about the significance of the results.

The sample size was small — only 42 samples were collected. However, within that small sample Dopp saw evidence of potential problems. Twenty percent of the samples—one in five—tested positive for coliform bacteria, an indicator of pollution from surface water or the feces of humans or animals. In addition, 14 percent of the samples exceeded the U.S. Environmental Protection Agency drinking water standard for nitrate, thus posing a health risk for infants.

In addition to these human health hazards, Dopp also recognized a significant threat to the county's dairying industry. High nitrates in water, in combination with high nitrates in feed, could cause adverse health effects in dairy herds.

Beyond the immediate water quality concerns, most of the participants had little or no information about the status of their water wells. Sixty-seven percent—two-thirds—did not know when their water had last been tested. Over 50 percent had no information about the type of well construction they had, or the depth to water in their wells. Dopp became increasingly concerned about the quality of the rest of the estimated 5,500 private wells in the county.

Clark County Board Acts

In April 1987 these parallel efforts coalesced when Foye, Dopp, and Madison approached the Clark County Board, which appropriated $22,000 for a study of the county's groundwater.

Leadership And Visibility

Mary Ellen Sjolin, county Extension home economist, University of Wisconsin, quickly recognized that the Clark County Extension Homemakers group, with 528 members in 42 clubs, could be a vital force in the project.

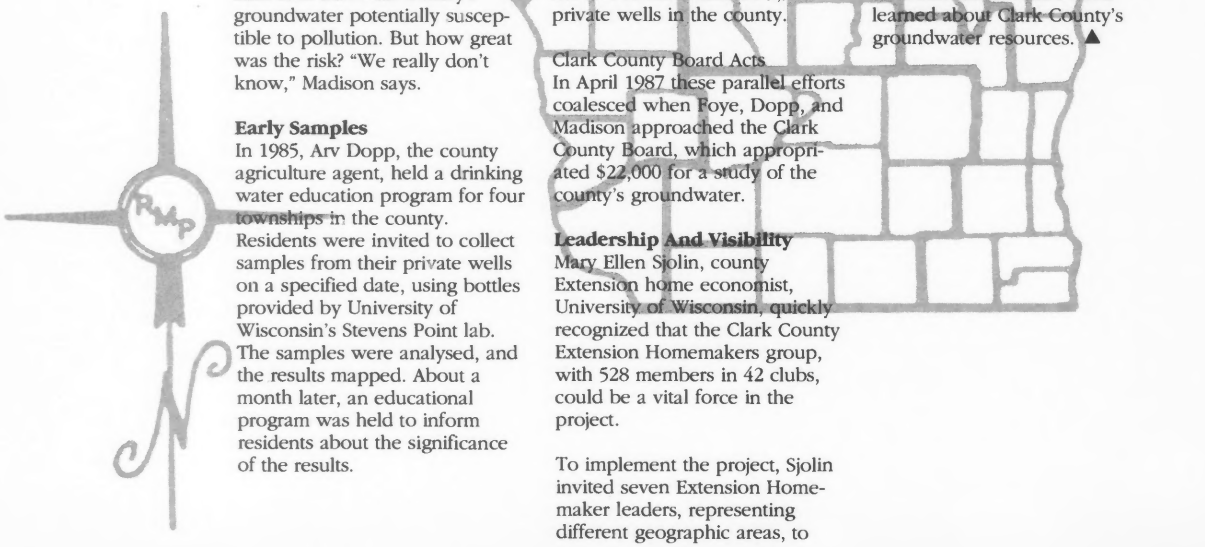
To implement the project, Sjolin invited seven Extension Homemaker leaders, representing different geographic areas, to serve on a planning committee. The committee's tasks were to decide on promotional strategies, sample bottle distribution and collection methods, and evaluate educational opportunities and needs.

The group quickly mobilized a core of 105 volunteers. They received training from Madison, the county staff, and Chris Mechenich, Extension groundwater education specialist, Central Wisconsin Groundwater Center, on the reasons for the project, and the details of gathering all the information needed to produce the water quality maps. County residents were informed about the project through newspaper ads, radio programs, and 6,000 brochures mailed with ASCS, The Aging office, and Extension newsletters.

Early Benefits

With 20 percent of the county Extension Homemaker membership involved in the project as volunteers, and the county organizations as a cosponsor, Sjolin believes that the visibility and influence of the group has increased.

Four education programs are scheduled for July to let county residents know what's been learned about Clark County's groundwater resources. ▲



Bay Projects— Teaching Youth Resource Awareness

4-H club members place a piece of wax paper in front of them. The volunteer leader places a drop of an "unknown" liquid on the wax paper. (The leader knows that it is water but the 4-H'ers do not.)

The youth eye the drop critically and use a toothpick to move it around, as instructed.

"Why does the drop stay round? How does the drop behave as you pull the toothpick through it?" asks the leader.

The leader asks the 4-H'ers to dip their toothpicks into a "special" chemical (actually liquid detergent). Then, as they touch their toothpick to the drop, the drop disintegrates and spreads over the wax paper.

Gasps of wonder and amazement follow; then a lot of questions.

This is one of the activities from the 4-H Marine Project—"What is Water?"

Junior Project Publications
A series of 4 marine/aquatic education projects has been developed for youth ages 9-12. They provide a variety of hands-on and group activities related to water resources.

Originally sponsored by the Virginia Sea Grant Program in 1984, the four existing units and accompanying leader guide have been rewritten and reprinted this year by a grant provided by the National Science Foundation. In addition, five more projects are planned for 1989.

The second project, "A Stream Becomes an Ocean," follows the flow of water from mountain to ocean by picture and story. Participants also follow 95,000 cubic miles of water through the water cycle. The third project, "What is an Ocean?", describes major ocean features, how the oceans became salty, and how the ocean floor is mapped. Tides are also explained with pictures and activities. The final project, "Marine Resources," investigates seafood, mineral, and other water-related resources.

All of the projects use word puzzles and activities to emphasize important terms. In addition, games are used to stress important concepts covered by the units.

Chesapeake Bay Projects
• Collect, compare, and identify examples of underwater aquatic plants.

• Research how animals use aquatic plants.

• Study the amount of sediment carried by local streams and rivers.

• Use Best Management Practices to help reduce soil erosion in your yard.

• Set up a demonstration plot to show the proper use of home and garden fertilizers.

These are a few of the activities from a series of intermediate 4-H project publications about the Chesapeake Bay.

The Chesapeake Bay, North America's largest and most productive estuary, is in serious trouble. The Environmental Protection Agency's 6-year study of the bay found four major problem areas threatening biological production and water quality: soil erosion, loss of submerged aquatic vegetation (SAV) nutrient enrichment, and toxic pollution.

To help educate youth about these issues, the Virginia Department of Conservation and Historic Resources has funded the development of 4-H project publications about each of these issues. Presently, projects concerning soil erosion and SAV have been developed. Designed for youth, ages 12-14, the projects contain information about each environmental topic, suggested project activities, and describe how youth can help reduce pollution threatening the Bay. In addition, leader guides are provided for each project. The two remaining projects will be completed this summer.

4-H youth, under the guidance of a marine agent in a Virginia marine/aquatic education project, learn to carve scrimshaw and make articles that resemble those fashioned by American whalers out of ivory over a century ago.

Paul Davis, Extension Bay Education Coordinator, serves as the liaison with the Virginia Division of Soil and Water Conservation, and has been instrumental in getting the publications funded.

The author has relied on a number of researchers and specialists to review the publications. "The information in the publications is current and the issues are most critical," says Fox. "I feel it is important that we educate youth about the Bay as well as help them develop a greater awareness and appreciation for this magnificent natural resource," he adds.

Environmental Awareness
The rapid urbanization of America, loss of critical wildlife habitat, and increasing pollution pressures on the environment, make it imperative that youth develop a concerned attitude about the natural world.

To do this, the Bay projects combine information with hands-on activities. Participants are encouraged to go out and observe. Youth develop an understanding of what has happened to Bay resources and what will continue to happen unless the current rate of environmental deterioration is reduced. ▲

Barry W. Fox
Extension Specialist, 4-H,
Marine Education,
Virginia Tech,
Blacksburg

North Carolina—
50 Years Of Progress

For the past 50 years, water quality has been an integral part of the Extension Biological and Agricultural Engineering program at North Carolina State University. In the 1930s and 1940s, emphasis was on conservation measures to control erosion for improved water quality and increased farm productivity. In the 1950s and 1960s, emphasis was on irrigation and land forming to improve yield and surface drainage.

During the 1970s and 1980s, programs were added on livestock waste management; land application of agricultural, municipal, and industrial wastewaters; on-site wastewater management; nonpoint-source pollution control; and household water conservation. Recent years have seen a renewed interest in the priorities of 50 years ago—conservation techniques to improve water quality and increase farm productivity.

The success of Extension's water quality programs has resulted, in part, from (1) strong cooperation between Extension and research programs, encouraged by the fact that many faculty members hold joint Extension-research appointments and (2) strong interagency cooperation.

Livestock Waste Management

A major goal of Extension's livestock waste management program has been to nurture cooperation among commodity professionals, conservationists, technical service agencies, agricultural advisory associations, and regulatory agencies. The program emphasizes

• **Education**—A primary focus has been on methods for making maximum use of manure nutrients and methods for reducing wastes.About one-third of the 1,000 North Carolina dairy farms have used Extension-developed plans to build liquid manure storage systems.

• **Economic incentives**—Extension's emphasis on the need to match manure nutrients with crop needs has led to an inexpensive organic waste analysis service offered through the State Department of Agriculture.Use of this service by a 100-cow dairy farm in conjunction with sound management and agronomic practices can result in annual savings of $3,000 to $5,000 in fertilizer expenses.

• **Regulation**—Extension led the establishment of cooperative strategies for implementing the North Carolina regulatory program for livestock waste discharge elimination.

• **Nonpoint-source Control**–The emphasis on land application of wastes has necessitated Extension programs to evaluate the water quality impacts of runoff from such lands and to recommend best management practices (BMP's) for control of

nonpoint-source pollution. These BMP's have been shown to reduce runoff by about 50 percent, nitrogen and phosphorus losses by more than 90 percent, and sediment loss by more than 95 percent.

Water Quality
The water quality group, supported by grants and cooperative agreements, monitors water quality literature, analyzes data from nonpoint-source projects, and prepares reports on state-of-the-art technology. The group is conducting a national water quality evaluation project and provides analysis for many state and federal nonpoint-source projects.

The group advises Extension and other agencies about management, assessment, modeling, and other aspects of nonpoint-source programs and also develops and maintains databases. Projects at the state level include the development of educational materials for sediment control and pesticide management.

Water Watch
Through its water conservation program called "Water Watch," Extension provides educational and technical assistance for installation of low-volume plumbing fixtures. More than 100,000 North Carolina households are implementing Water Watch recommendations for a total annual savings of about $20 million.

Wastewater Management
Many factors, such as restrictive requirements in environmentally sensitive areas, difficult topography, and high water tables, have led to great demand for information on acceptable alternatives to standard septic tank systems. The department has responded by cooperating with the Extension soil science department to develop and demonstrate alternative systems and produce educational materials about them.

Land Application Of Wastes
Extension's educational efforts have led to widespread use of land application systems for wastewater and sludge. More than 1,000 farmers throughout the State are using either wastewater spray irrigationsystems or land application systems.

Farmers report that application of wastewater sludges results in savings of $50 to $70 per acre. The first 18 wastewater spray irrigation systems installed saved an estimated $7.2 million in construction costs compared to costs for comparable stream discharge systems. The fertilizer value for this wastewater resource is about $2.5 million per year.

Extension and the state regulatory agency have produced a series of publications to facilitate the planning, regulatory approval, installation, and operation of land application systems. Extension cooperates with health and regulatory agencies to provide training for certification of system operators.

Water Management
The total water management program emphasizes integrated water management systems for enhanced production and water quality. Key areas include irrigation, drainage, water conservation, water supplies, erosion, and water quality.

Water management programs help growers select and use efficient systems that are tailored to site-specific needs. Training programs emphasize use of practices that collectively improve production efficiency, water conservation, and off-site water quality. Educational programs include, for example:

- **Water Table Management**—promoting such practices as controlled drainage and subirrigation for poorly drained soils.

- **Training** for Extension agents and SCS personnel—focusing on soil and site evaluation to determine suitability for water management practices, including use of DRAINMOD (a computer-based water management simulation model).

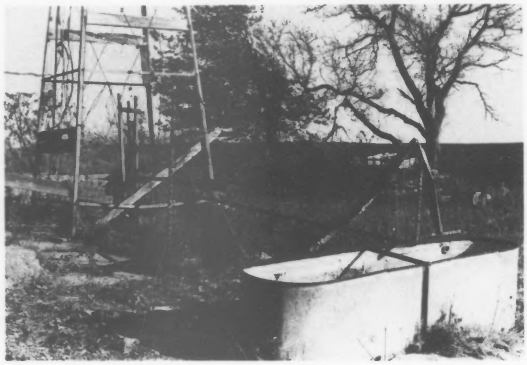
- **Water Control Structures**—working with the soil science department, SCS, and the Soil and Water Conservation Commission to encourage drainage control. The more than 1,500 structures already installed provide controlled drainage on nearly 60,000 acres and reduce nitrogen loadings to streams by nearly 1 million pounds annually.

- **Irrigation**—educating producers about (1) irrigation techniques that provide optimal water and energy conservation and (2) equipment selection and design. Extension advises growers not only about soil-water control, but also about using irrigation for frost/freeze protection, evaporative cooling for high-value crops, and for chemigation and fertigation. In the past 4 years, expanded uses of irrigation have added an estimated $2.25 million to the state's gross agricultural income.

- **Supporting The National Initiative**—North Carolina supports the Extension national initiative on water quality by a comprehensive Extension program, cooperative agency activities, and legislative funding. ▲

Co-authored by the following staff of the Department of Biological and Agricultural Engineering, Agricultural Extension Service, North Carolina State University, Raleigh: *James Barker, Livestock Waste Management Specialist; Robert Evans, Water Management Specialist; A. R. Rubin, Water and Waste Management Specialist; Ronald E. Sneed, Irrigation Specialist; Michael Smolen, Water Quality Group Leader; and Frank J. Humenik, Specialist In Charge.*

...and Not A Drop To Drink?



Morgan Powell
Extension Natural Resources Engineer, Kansas State University, Manhattan

Kansas officials are aware that abandoned wells may pose a contamination threat by direct connection to the groundwater aquifer below. Extension specialists from Kansas State University conducted a farmstead well survey in cooperation with the Kansas Department of Health and Environment.

Water quality—an important public concern—is one of nine national priority initiatives of the Cooperative Extension System. It is also one of six priority concerns for Extension at Kansas State University. Clearly, water quality has become a public issue.

In Kansas, public water systems serve four of five residents and groundwater provides more than half of that supply. For several years, the Kansas Department of Health and Environment (KDHE) has examined public water wells for volatile organic compounds (VOC's) and pesticides, as mandated by the new regulations of the Safe Drinking Water Act to be implemented during 1988-91. Because of what it found in the water, KDHE has shut down 40 of 1,700 public water supply wells checked to date. (There are 2,100 such wells statewide.)

Task Force Formed

Growing concerns about water in Kansas led Kansas Extension administrators and specialists to offer a public educational program on water quality. They formed a five-member Water Quality Task Force to examine problems related to private water supplies and the impact of agriculture on water quality. In 1986, Kansas Extension added five more professionals to the task force to include all Extension program areas. Household water quality has emerged as the primary program.

To help determine the scope of the problem in Kansas, scientists from Kansas State in cooperation with the KDHE conducted a random farmstead well survey. Of the 187 wells tested, 37 percent exceeded the maximum contaminant level (MCL) for some inorganics. Nitrate was the most common contaminant; 28 percent of the wells exceeded the safe drinking water standard. The survey also showed selenium and fluoride exceeded the standard in some wells.

Pesticides or VOC's, or both, were found in 10 percent of the wells. This figure is cause for concern because organics are of relatively recent use. Their presence may be increasing and may pose a greater problem in the future.

Kansas has about 126,000 private water supplies consisting of mostly wells, drawing from groundwater. An estimate based on the farmstead survey shows that 500,000 people, or about 20 percent of the population of Kansas, depend on private water supplies. The state has few regulations and no testing requirements for these systems. The user or owner is responsible for the quality of the water. Although the user or owner is also the operator and sanitarian, few well owners have their water supplies tested more than once.

Rush County Survey

A 1988 project in Rush County, Kansas, involved testing supplies from 186 water wells. County Extension Homemaker Club helped the Water Quality Task Force in the survey effort. Results for Rush County mirrored those of the statewide farmstead well survey; 28 percent of the wells exceeded the drinking water standard for nitrates and one well exceeded the limit by 13 times. Such wells are potentially hazardous to humans and livestock.

Although the Rush County survey did not include bacteria testing, about 25 percent of the wells would be expected to also contain bacterial contamination, based on bacteria tests from private wells by some laboratories.

Abandoned wells are another concern in Kansas. The number is uncertain, but Kansas may have 500,000. Abandoned wells represent a safety hazard and many also serve as a direct pathway for contamination of the aquifers below. The task force is concerned that these wells be found and plugged properly.

Last fall we trained about 150 agents, health specialists, and lay leaders in water quality. Our goal: To help them become community resource persons. In early 1988, the task force and Extension's Department of Communications began a weekly 30-minute radio program and a weekly newspaper question-and-answer column on water quality issues and topics.

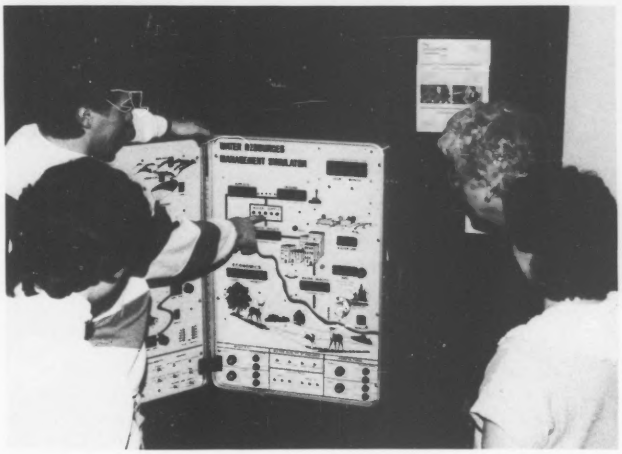
We have also launched (Water Education for Teachers), WET and will hold 10 training sessions this fall. We plan to offer 50 to 60 lesson plans and training for grade and middle school teachers. Yet another project will involve countywide followup meetings in response to anticipated increases in water well testing.

Future Educational Efforts

Safe drinking water is an important public issue. The Extension water quality program at Kansas State University addresses this question by helping people evaluate their problems and find solutions. For example, we will hold 24 meetings in 20 counties (one-fourth of the state's counties) this fall. At these water quality clinics, people can bring results from a test they will have made of their household water, and they can get ideas on how to improve its quality, if needed. ▲

Watershed In A Suitcase

John R. Amend
Professor of Chemistry,
Montana State University,
Bozeman
and
Jack Watson
Extension Water Specialist,
The University of Arizona,
Tucson



A Groundwater Management Simulator—a "watershed in a suitcase"—is examined by participants at a water management workshop. The simulator is used to model the hydrologic and economic behavior of a watershed, an aquifer, and a water use area.

Effective management of water is a problem that crosses the traditional disciplines of science, engineering, economics, and social science. Montana State University and the University of Arizona have been working with a number of other agencies in a long-term project to improve public and legislative understanding of the major water problems, associated hydrologic concepts, and strategies involved in management of the Nation's ground and surface water resources.

Computer Simulation

A unique feature of this project is its use of a Ground Water Management Simulator—a "watershed in a suitcase." This "user-friendly" program is used in workshops to model the hydrologic and economic behavior of a watershed, an aquifer, and a water use area involving both municipal and agricultural use of water.

The simulator poses supply, demand, and quality problems to workshop participants, who are placed in management situations involving real problems and alternatives. They are not offered solutions, but instead an opportunity to experiment with alternative solutions and to endure and evaluate the consequences of their actions.

After observing the results of the simulation, participants discuss the strong and weak points of their strategy, revise their management plan, press the reset button, and try again.

Workshop leaders become facilitators rather than lecturers. Scarce time with learners is used efficiently.

Because the response of water resource systems to both destructive forces and constructive management practices is often measured over generations, a public education program must deal not only with today's voters and policymakers, but also with the youth who must deal with these problems tomorrow.

Program Content

Knowledgeable public participation in development of water management policy requires an understanding of basic hydrologic principles as well as the economic and political aspects of water management. To provide this understanding, the content of this program is organized around six conceptual areas: the supply of water; the uses of water; water quality issues; water management strategies; economic factors in water management; and development of water management policy.

The Simulator In Action

All of these conceptual areas are included in the design, calibration, and operation of the Water Resources Management Simulator. The simulator may be easily programmed to represent the precipitation, stream flow, groundwater, and water uses that are characteristic of specific regions of the country.

To honestly model a natural resource system requires 10 to 30 variables. Since few people can handle more than three interacting variables at one time, this simulator provides control simultaneously to five groups of people, each with three controls and a different managerial role in the simulation.

One group, for example, is responsible for reservoir management. Another group selects the source of water for the municipality, drills the well if needed, and makes sure that there is a sufficient supply of water. A third group selects per-capita water use for the city and handles treatment of incoming water and waste water. Two other groups handle water-supply and water-use decisions for the agricultural area.

The groups must work together to supply water of adequate quantity and quality at the lowest cost. Their success is indicated by the computer's assessment of the cost/benefit results of their efforts.

The political aspects of water management are well illustrated by the roles these groups play and the cooperation that must exist between the groups to successfully manage the system.

Water Issues Are People Issues

Throughout the simulation, the workshop leader serves as a resource person, providing information as questions and "teachable moments" arise.

Participants are left with an understanding that water issues are people issues and that decisions made by ordinary people create the situations in which water managers must work. ▲

Protecting The Environment

Del Marks
Extension
Communications
Specialist,
Iowa State University,
Ames

Randy Killorn (left), Extension agronomist, Iowa State University, takes soil sample at a field demonstration with Joyce Hornstein, Extension associate. Marco Buske (right), area crop production specialist, assisted with plot supervision during the 1987 crop season.

Crops that grow in cleaner environments and take smaller amounts of fuel to produce may soon become a way of life for Iowa corn and soybean farmers. An innovative program funded by the Iowa legislature and carried out by a consortium of public and private agencies is demonstrating how to use less energy in producing crops and how to reduce risks to the environment.

Field Demonstrations
Iowa State University (ISU) has been awarded two contracts in connection with the program: "Demonstration of Energy and Environmental Benefits Through Tillage, Nutrient, Pesticide, and Water Management," and "Education and Best Available Technology Assistance."

The ISU Agricultural Experiment Station and Cooperative Extension Service jointly conducted replicated field demonstrations at 59 locations in 32 of Iowa's 99 counties during the 1987 crop season. Work has started on a similar number of demonstrations this year at locations that include about 20 new counties. The long-range goal is to locate at least one demonstration in every county by the time the project ends in 1991.

Farmer Cooperators
About two-thirds of the 1987 demonstrations were on private fields of farmer cooperators; the rest were at various Iowa State University research centers.

The large number of farmer cooperators is an essential element in getting the demonstration information into the hands of other farmers, says Gerald A. Miller, Extension agronomist and coordinator of the Extension component of the program.

Focus On Key Concerns
Fertilizer production and application account for the largest amount of energy consumed in grain production. Fertilizers, pesticides, and fuels are some of the largest nonland variable expenses that the farmer can adjust. Therefore, these are key elements in the Extension demonstrations. The demonstrations also focus on the growing concerns for the farm family's exposure to toxic and hazardous chemicals.

The demonstrations are designed to increase the understanding of farmers and the general public about groundwater quality issues, including the condition of groundwater supplies and the causes of nonpoint-source contamination. They identify ways to maintain efficient production while reducing contamination of groundwater by chemicals, nutrients, and sediment.

Best Management Practices
Another phase of the project is the development of Best Management Practices (BMP's) that farm operators can use to protect groundwater and increase farming efficiency, energy conservation, and farming profitability. Two 1,100-acre watersheds were selected for BMP activities in 1987.

Some of the BMP activities include: insect scouting as part of an integrated pest management program; making good use of soil testing; assessing current and past crop management and land management practices; taking inventory of livestock; calibrating sprayers; implementing alternative tillage practices; keeping crop enterprise records; and sampling wells.

Attitude Survey
In conjunction with the BMP activities, Extension surveys farmer attitudes toward groundwater issues and conducts followup studies to determine changes that result from the educational efforts. Preliminary data on fertilizer application rates at 21 sites in 1987 indicated that, on the average, farmers applied 90 pounds of nitrogen per acre more than the crops could use to obtain optimum economic yields. These results were for 1 year only; the demonstrations will be continued for 3 more years to test the validity of the 1987 findings.

Statewide Effort
The Extension project is part of the statewide Integrated Farm Management Demonstration Program administered by the Agricultural Energy Management Advisory Council of the State of Iowa. Other participants include the Iowa Department of Agriculture and Land Stewardship, the Iowa Department of Natural Resources, the USDA Agricultural Research Service, and the Iowa Natural Heritage Foundation. ▲

The Long Island Sound Study

Norman Bender
Extension Program Leader,
and
Kathleen Rhodes
Extension Public Participation Coordinator,
and
Chester Arnold
Marine Extension Agent,
Connecticut Sea Grant Marine Advisory Program,
Groton

Tim Visel (left), Extension marine agent, dumps oyster "cultch" (clean oyster shells) from his boat onto an oyster bed in the Pattagansett River near Long Island Sound, New York, to stimulate oyster growth. Assisting Visel are Dennis Murphy (middle), first selectman of East Lyme and Craig Andrews, a volunteer. One of Extension's goals is a clean Long Island Sound that will allow for the continued growth of the oyster industry.

Long Island Sound is an estuary stretching 110 miles from the densely populated New York City area to the less developed eastern areas of Long Island and Connecticut. Often called the "Urban Sea," its coastline is home to over 5 million people.

Recently, concern over the health of the Sound led to the initiation of the Long Island Sound Study (LISS), a cooperative effort of federal, state and local public agencies, academic institutions, industry, environmental groups, and the general public. The study is part of the National Estuary Program, which was established by the 1987 Clean Water Act to preserve and restore the health of the Nation's estuaries. Areas where salt and fresh water mix, estuaries are highly productive in terms of marine life.

The 5-year Long Island Sound Study began by addressing two questions of concern to the public: "1) how healthy is the Sound today? and 2) Is the Sound getting cleaner or more polluted?"

Educating The Public

The LISS public participation and education effort addresses the need to integrate research findings and public concerns into LISS recommendations. Sea Grant programs in Connecticut and New York State were chosen by the U.S. Environmental Protection Agency to develop a public participation project that would: 1) broaden the study's contact with user groups; 2) strengthen the Citizens' Advisory Committee by expanding its representation; and 3) implement a broad program of public information to increase public awareness of current environmental issues, research findings, and proposed solutions.

Chester Arnold, marine Extension agent in Connecticut, initiated the project in 1987 by serving as acting public participation coordinator for Connecticut and New York.

Arnold, together with Kathy Rhodes who assumed the full-time coordinator's role in January, 1988, organized a variety of educational activities designed to reach hundreds of thousands of people involved with Long Island Sound.

Thousands of people learned about the goals of the LISS through Arnold's participation on a statewide public television program and in four radio interviews. And seventy State and local Connecticut officials from Stamford to Stonington learned about the LISS and its potential impacts upon their communities at a workshop co-sponsored by Connecticut's U.S. Representatives.

Fact Sheet Series

In addition, a fact sheet series which addresses critical issues was begun. The first fact sheet, *Hypoxia in Long Island Sound*,reviews the impacts and possible causes of low levels of dissolved oxygen in western Long Island Sound.

Rhodes and Arnold will be joined by a public participation coordinator for New York State in late 1988. This will allow coastal residents in both states to have regional access to project staff. A formal mechanism for the participation of user groups with the LISS is the Citizens' Advisory Committee (CAC). Sea Grant Marine Advisory staff assisted the Committee in expanding its membership base to include 25 members representing a wide variety of municipal, industrial, environmental and educational interests.

Involving Scientists

Slide presentations for symposia, festivals, and conferences are being developed by Public Participation Staff, Rhodes, and Arnold, as well as by the members of the Citizens' Advisory Committee, and offered to civic groups and municipal commissions.

Road Tour

The successful Long Island Sound lecture series format, initiated at the University of Connecticut, Avery Point Campus, will be sent on a "road tour" to reach the public in western Long Island Sound (Fairfield County, Connecticut, and Westchester County, New York) and along the Long Island, New York coastline (Nassau and Suffolk Counties). The series will tap the expertise of marine researchers and resource managers from the University of Connecticut, State University of New York system, and local, state and federal agencies.

Summary

Connecticut's and New York's Sea Grant Marine Advisory Programs are developing new ways of bringing together marine researchers, educators, resource managers, environmental and civic association representatives, and the public to share knowledge and concerns. The public education efforts will continue with increased emphasis on documenting public views regarding alternative solutions for protecting the environmental quality of the Sound. ▲

New Answers For Nevada Water Problems

Lora Minter
Extension Publications Writer,
University of Nevada-Reno

Because of the explosive population growth in the Las Vegas Valley, experts agree that southern Nevada will face a water crisis by the year 2000. If water conservation efforts are not taken to heart, the steady stream will slow to an undependable drip.

Many decisionmaking Las Vegans are aware of the impending crisis. A 1986 poll conducted by the College of Agriculture at the University of Nevada showed that water management was the leading concern among the interviewed civic leaders and government officials.

Research Priority
In response, the college's Plant Science Department and Southern Nevada Cooperative Extension moved water efficiency issues to the top of the research list.

Dale Devitt, a soil and water scientist based at the University of Nevada-Las Vegas, devotes a large part of each day to researching water—its quality, quantity, and clarity.

Calculating Water Saved
Devitt has started an innovative experiment at two Las Vegas golf courses, Spanish Trails and the Sahara Country Club, and at Horseman's Park. At these sites he has developed irrigation systems that use meteorological data to predict eva_t otranspiration (the total water loss from the soil, including direct evaporation and the water lost from plant surfaces). As a result, Devitt will be able to determine the actual amount of water saved by comparing the quantity of water he applies to the amount of water that employees at the site apply.

Once crop coefficients are calculated they will be distributed to the valley's 500,000 water users by Extension Horticulturist Robert Morris (in cooperation with the National Weather Service, local media, and the local water district). This new information will allow consumers, turf managers, and personnel in government agencies to cut water costs by increasing their efficient use of water. "We are estimating potential water savings as high as 50 percent," Morris reports.

Drip Irrigation
Devitt is experimenting to discover whether drip irrigation can increase water use efficiency. He believes subsurface drip irrigation has potential to increase efficiency in very windy areas and in areas where turf is utilized 24 hours a day.

Water Allocation
A long-standing problem in Northern Nevada continues to be the question of water allocation.

To partly resolve water conflicts, the Bureau of Reclamation has proposed certain Operating Criteria and Procedures (OCAP) to be followed by the farmers and ranchers of the Truckee Carson Irrigation District (TCID).

Rangesan Narayanan, associate professor in the college's Agricultural Economics Department, and Tom MacDiarmid, a graduate research assistant, have been working on research that will provide information to the TCID. Their study has resulted in relevant economic analyses that can be used in making long-term decisions that affect the Newlands Project. Rangesan and MacDiarmid chose to investigate one method of increasing efficiency—concrete lining of canals.

Optimization Model
Through statistical analysis and data provided by the TCID, Rangesan and MacDiarmid compiled all the physical data for the area and constructed a computer optimization model. The model describes the Carson Division's irrigated agriculture area and the main canal system between the Lahontan Dam and Stillwater Wetlands surrounding Fallon.

According to MacDiarmid, the computer model will choose the canal segments that need to be lined by comparing the dollars earned by the acreage served to the costs of lining the canals. ▲

Extracted from articles in ***AG-FORUM****, a quarterly newsletter published by the Agricultural Information Office, College of Agriculture, University of Nevada-Reno.*

Sewage System Strategies

Roger E. Machmeier
Former Extension Agricultural Engineer, University of Minnesota, St. Paul

When Minnesota's Shoreland Management Act was passed in 1968, the Extension water quality specialist already had established an educational program on onsite sewage treatment for homeowners and local government officials.

Because the act gave particular emphasis to onsite sewage systems, local officials requested more intensive training on all aspects of such systems. Extension responded with a 3-day workshop which proved so popular that it will have been presented approximately 100 times by the end of 1988.

The workshops provide local government officials with the information they need in order to issue permits for the installation of onsite sewage treatment systems and to inspect the construction of those systems, and they help sewage treatment professionals keep up to date on the latest technology and do a better job.

Developing Effective Standards
When the Minnesota Pollution Control Agency proposed changes in the state standards for onsite systems in 1973, their plan met with severe objections. In 1974, agency personnel began making presentations at Extension's onsite sewage treatment workshops. The proposed standards for individual sewage treatment systems were discussed at the workshops each year, modified as appropriate suggestions were made by workshop participants, and finally adopted by the state in 1978.

Workshop Format
Workshops have been held throughout Minnesota in locations selected on the basis of local interest and in consultation with local government officials such as zoning administrators, sanitarians, and inspectors.

The staff of special programs at the University of Minnesota handles all the arrangements; the Extension engineer provides the technical content and makes workshop presentations; and staff members from the university's soil science department and the Minnesota Pollution Control Agency conduct the workshops.

Broad Range Of Topics
Workshop topics have been adjusted over the years to ensure that they cover the full range of information needed by people who work with onsite sewage treatment systems. The first day provides basic information on designing a drainfield trench system in soils which are suitable for sewage treatment.

The second day covers sewage system design for problem soils; mound design and construction; preliminary site evaluation procedures using soil surveys, maps, and other pertinent information; field site evaluation procedures, including soil borings and percolation tests; septic tank construction and operation; and pumping stations.

The third day includes a discussion of small collector systems serving up to 12 residences and using a common soil absorption system. Septic tank cleaning and the land application and utilization of septage is the final workshop topic, with emphasis on the importance of proper maintenance of onsite systems.

Voluntary Certification
At the conclusion of each workshop, the Minnesota Pollution Control Agency gives a 4-hour written examination for participants who wish to become certified in the field of onsite sewage treatment. Certification is not mandatory statewide, but since the program began in 1980, 17 of Minnesota's 87 counties have instituted a certification requirement.

Positive Results
Local officials and experienced contractors have observed a dramatic improvement in both the level of knowledge about onsite sewage treatment and the quality of system installations. As a whole, the improved practices have not only had a profound effect on the design, installation, and maintenance of onsite systems, but also have proven cost-effective.

Basic Program Requirements
Minnesota has learned that a program such as this one has several fundamental requirements:

- An Extension specialist who is technically competent in the area and who will keep up to date on new technology;
- A sound set of state standards around which to develop an educational program. The standards must be dynamic and always open to challenge and change. Extension may need to be the catalyst for developing these standards;
- A broadly representative advisory committee to make recommendations to the state agency responsible for onsite systems;
- A commitment in time and money by the state agency responsible for onsite systems, and a close working relationship between that agency, local government officials, and sewage system installers;
- Demonstration-research to prove the local applicability of new or unfamiliar technology; and
- Informed taxpayers who are willing to provide the land-grant university and the State agency enough money to put sound onsite sewage treatment technology into effect. ▲

Florida Focus On Water Quality

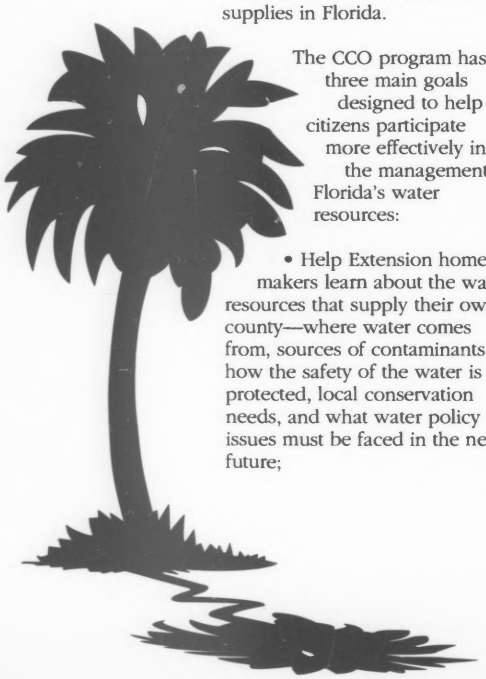
Virginia Peart
Special Advisor To The Florida Extension Homemakers Council, and
Extension Housing Specialist,
University of Florida, Gainesville

Although Florida is considered to be a water-rich state with more rainfall than most other areas of the country, groundwater is limited in many areas. Why is water quantity a problem? The population has escalated from 3 million in 1950 to about 12 million in 1988. It continues to grow at the rate of 700 to 900 new residents per day. Sixty percent of these new residents settle in the already densely populated coastal areas.

Florida also has widespread water quality problems. The sandy soils permit contaminants that have been used or disposed of on land surfaces to move into the aquifers that are the source of water for the state.

Recognizing The Problems

The Florida Extension Homemakers Council (FEHC) has made the state's water problems a high-priority concern. Through its Citizenship and Community Outreach (CCO) programs, the Council is attempting to make its 8,400 members aware of the importance of citizen responsibility for the preservation, development, and fair allocation of water supplies in Florida.



The CCO program has three main goals designed to help citizens participate more effectively in the management of Florida's water resources:

- Help Extension home makers learn about the water resources that supply their own county—where water comes from, sources of contaminants, how the safety of the water is protected, local conservation needs, and what water policy issues must be faced in the near future;
- Lead local citizens in preserving the quality and quantity of local water supplies through individual and group action; and
- Promote appropriate water policy development in local, district, and state agencies.

Planning for the 3-year Water Quality and Public Policy Program started in 1986. Leadership came from CCO Chair Doris Glover, Polk County; Polk County Agent Advisor Ann Rye; and Florida State Specialist Advisor Virginia Peart.

Initial activities included identifying county CCO chairs, establishing a time schedule, developing a situation statement, and planning activities to equip potential Homemaker Leaders to plan and present state, district, and county programs on water quality and public policy.

Training The Trainers

Early in 1987 each county CCO chair and county Extension home economist received an explanation of the 3-year program and an invitation to enroll in the June training session.

That meeting consisted of two 3-hour workshops. The first included a discussion of current news concerning water problems, a slide presentation on "Florida's Water Resources," and an illustrated talk entitled "Causes and Consequences of Water Contamination in Florida."

The second day's workshop dealt with water management in Florida. Beginning with background presentations on the laws and institutions that serve as the basis for water management, the session progressed to an exploration of "Water Policy: How Does It Happen?" Participants in that segment of the workshop included a state legislator, a representative of a state regulatory agency, and a county commissioner.

The program ended with a discussion of "What FEHC Can Do in Your County." Participants received a packet containing information on how to order slide sets and fact sheets, copies of community action guides on groundwater and drinking water, and the addresses and telephone numbers of the five Florida water management districts and the six district offices of the Florida Department of Environmental Regulations.

Putting Training To Work

The trained leaders are now carrying the message about water issues to others throughout the State. A water management workshop that took place in Tampa in January 1988 is a good example. The 2-hour program on water management in Southwest Florida was presented by a panel of speakers from the University of Florida, the Florida West Coast Regional Water Supply Authority, the Southwest Florida Water Management District, and the Pasco County Citizens Water Advocacy Council.

Participants learned about the hydrologic cycle, how to minimize water quality impact, how water is allocated in their area, and indoor and outdoor conservation. Other areas are planning similar workshops and other activities designed to involve citizens in water issues.

Program Impact

As the program continues in its second year, FEHC members are building confidence in their abilities to understand Florida's fragile water resources. During the third year (1989-90), the county CCO chairs will be evaluating the program's success and writing their final reports. However, the interest they have generated may lead them into more efforts to participate in the protection of Florida's water quality. ▲

A Water Quality Weekend

Marcus R. Butterfield
Extension State 4-H Leader,
University of Delaware, Newark

Extension 4-H specialists at the University of Delaware wished to teach younger 4-H'ers such basic concepts of water quality as the hydrologic cycle, the movement of both surface and groundwater, and how groundwater becomes polluted.

To accomplish this, they decided to hold younger-member weekends—overnight camping programs for 8-to-12-year-olds—involving approximately 200 4-H'ers in three counties.

Once the campers were gathered, 4-H agents gave presentations to several classes of approximately 25 to 30 4-H youth each. The 4-H agents began each class by explaining to the youth that water is one of the three essentials for life. They showed campers information about the earth's supply of water. They discussed such terms as "surface water," "groundwater," and "aquifers." They gave the campers a description of the hydrologic cycle.

Taste-Testing Panels

Following this introduction, each participant was given three water samples in three-ounce paper cups. They asked youth to role-play as members of an "international water-quality taste-testing panel." The 4-H'ers were instructed to taste each water sample, make notes about it, and then rank the taste of the sample on a scale of one to three.

Based on their rankings, the 4-H'ers took a show-of-hand vote on which sample rated first, second, or third and then discussed their three selections.

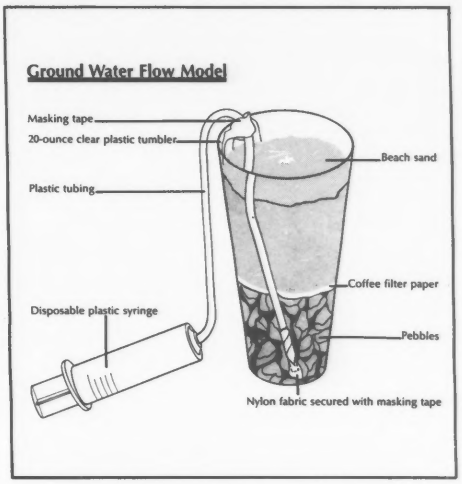
At this point, the sources of the water were then revealed to the "taste-testers." (Two of the samples had been drawn from the water supply at each of two Extension offices, and the third was bottled spring water.) This exercise clearly demonstrated to the group that there was a distinguishable difference in water quality in terms of taste. It also provided an opportunity to point out that good-tasting water isn't necessarily good-quality water. One of the samples had a higher-than-normal nitrate level, yet was one the youth had rated high on taste.

Maps And Flow Models

The second major activity of the program was designed to help the class understand the movement of groundwater. Using a geological map of the state, leaders explained aquifers and groundwater movement to the youth.

To help the 4-H'ers visualize the movement of pollution through the ground, small groups of five or six 4-H'ers built a ground water flow model. This model was made of a 20-ounce, clear plastic tumbler, a 12-inch length of clear plastic tubing, a small piece of nylon fabric, masking tape, small pebbles, clean beach sand, and a 3-inch circle cut from a coffee filter.

The piece of nylon was fastened with masking tape over the end of the tube to act as a strainer. The tube was then taped to the inside of the tumbler,



with the strainer at the bottom. The tumbler was filled approximately one-third with the pebbles, topped with the filter paper, and then filled nearly to the top with clean beach sand.

A recycled window-washing pump-spray bottle filled with water was used to make "rain" fall onto the sand. A disposable syringe connected to the plastic tubing provided a pump by which water could be drawn from the bottom of the model.

Working as a team, the 4-H'ers established a flow of water from the sprayer though the sand, into the pebbles, and back into the syringe.

Leaders then applied a drop of red food coloring to the top of the sand, to represent any of several kinds of pollution: improperly managed animal waste, a faulty septic system, an oil spill, improperly disposed household chemicals, or hazardous waste.

Pollution Made Visible

As they continued to cycle water through their model, the 4-H'ers could see the red coloring moving down through the sand and into the water coming from the bottom of their model. The participants could thus easily see the impact of surface problems affecting the groundwater supply.

The concluding discussion centered around what these young people, as individuals, could do to prevent groundwater pollution through the proper handling and disposal of household chemicals. Each 4-H'er was given a chart showing the recommended disposal methods for a variety of home and garden chemicals.

The 4-H'ers responded enthusiastically to the class. The simplicity of the program makes it easily adaptable to a variety of other settings such as other 4-H clubs or primary school classrooms. ▲

Connecticut—
A Community Response

Roy F. Jeffrey
Community Resource Development Agent, New London County Extension Office, Norwich, Connecticut

Detection of contaminated groundwater during the early-to-mid-1980s left residents of many Connecticut communities concerned about the safety of their drinking water. By 1985, an estimated 10 percent of the population (150,000 citizens) had been exposed to contaminated water sources.

With a new awareness of this issue, and limited experience and knowledge about how to prevent contamination at the local level, over 300 community officials responded to a comprehensive educational program about community groundwater management developed by Extension at the University of Connecticut.

Connecticut has long been a national leader in the environmental protection arena.

Although these and other state-level programs went a long way in reducing the potential for groundwater contamination, opportunities for future contamination still existed. Local communities needed to do much at their level to protect groundwater sources.

As contamination episodes became more publicized, it became evident that a needexisted for an education program on groundwater for local officials if communities hoped to comprehensively deal with protecting their groundwater resources.

Program Developed
Beginning in 1985, the University of Connecticut Cooperative Extension Service, through its Community Resource Development Program, developed a short course for local decisionmakers on groundwater management. During 1986 and 1987 the short course was offered on a two-evening basis at several locations across the state.

Rating Schedule
Since a variety of potential groundwater contaminants exist, Extension used a rating schedule developed by the Connecticut Department of Environmental Protection (DEP) which identified and ranked contaminant sources according to land use.

Three-Step Process
The short course emphasized that a groundwater protection program should consider not only planning matters, but also other day-to-day land use and operational/management activities by the commercial, industrial, residential, and government sectors that are not necessarily affected by planning and zoning matters.

With the practial knowledge gained through the CES program, informed local decisionmakers are better able to consider groundwater concerns as they deal with a variety of community issues. ▲

Water Conservation In Frederick City

Mike Sowell
Community Resource Development Agent, Frederick County, Maryland

In Frederick City, Maryland, Extension is responding with workshops and demonstrations to illustrate the benefits of water conservation to individuals and to the community as a whole.

Growth Necessitates Conservation
The population of Frederick city increased between the 1970 and 1980 censuses and growth is expected to continue. The city's water supply, which comes from the Monocacy River, is limited.

The mayor's office, anticipating the need for water conservation, approached Extension for guidance on reducing water consumption. Working with the mayor's representative and a registered plumber, Extension began developing a pilot water conservation program.

Selecting Cooperators
The pilot program was to be conducted with 120 homes representing a cross-section of dwellings throughout the city. Homeowners in these representative dwellings would be encouraged to install water-saving devices such as low-flow shower heads, aerators, and toilet dams. The devices would be left in the homes for 18 months, during which time the water consumption would be monitored.

Thirty-three residences served as the final basis for the analysis.

Measuring Results
During the first year, 33 homes saved a total of 236,000 gallons of water and $1,091 in water, sewer, and energy bills—an average of 7,200 gallons of water and $33 per household.

The devices paid an equivalent of the installation cost in about 7 months making them a reasonable investment for any household.

This data enabled the committee to project potential savings in water and sewer costs for the city's entire residential population. If 10,000 households (about three-quarters of the total) installed and used water-saving devices, the city could reduce water consumption by approximately 800,000 gallons daily and could save $150,000 in treatment costs over a 4-year period. The 10,000 homeowners collectively could save $1.2 million in water, sewer, and energy bills during the same period.

Adopting The Program
When Extension presented the findings of the pilot project to city officials, they unanimously agreed to implement a comprehensive water conservation program throughout the city.

In the first year more than 1,000 homes have been equipped with water-saving devices. The program is expected to last 5 years, and has the objective of involving 10,000 households. ▲

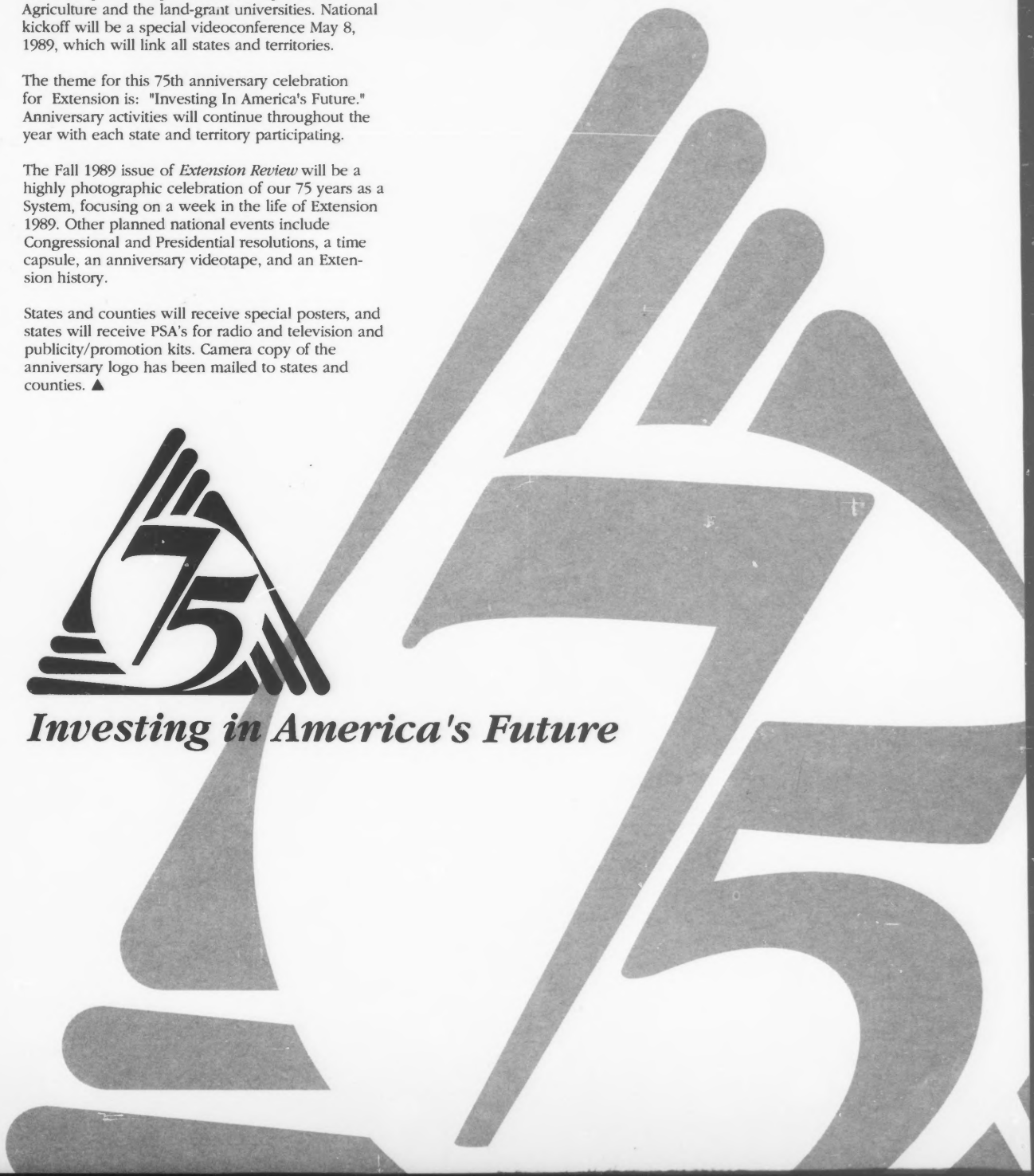
75th Anniversary Of The Cooperative Extension System

In 1989, the Cooperative Extension System will celebrate its 75th anniversary. It was established in 1914 as a partnership of the U.S. Department of Agriculture and the land-grant universities. National kickoff will be a special videoconference May 8, 1989, which will link all states and territories.

The theme for this 75th anniversary celebration for Extension is: "Investing In America's Future." Anniversary activities will continue throughout the year with each state and territory participating.

The Fall 1989 issue of *Extension Review* will be a highly photographic celebration of our 75 years as a System, focusing on a week in the life of Extension 1989. Other planned national events include Congressional and Presidential resolutions, a time capsule, an anniversary videotape, and an Extension history.

States and counties will receive special posters, and states will receive PSA's for radio and television and publicity/promotion kits. Camera copy of the anniversary logo has been mailed to states and counties. ▲



United States
Department of Agriculture
Washington, DC 20250

extension review

United States Department of Agriculture Winter 1988

Economic Development

Rural Economic Development—No One Can Do It Alone

Economic development cuts across all of Extension's programs. This issue of ***Extension Review*** will demonstrate how Extension is making a difference in communities across the Nation. But we cannot do it alone. We need cooperation and support from many other organizations, such as multicounty development districts and local governments. We are pleased to have guest editorials in this issue from Aliceann Wohlbruck and Jeffrey Schiff, executive directors of two organizations representing such entities.

Aliceann Wohlbruck
Executive Director,
National Association
of Development
Organizations (NADO)

The members of the National Association of Development Organizations (NADO) are delighted with Extension's commitment to Revitalizing Rural America. For the last 20 years NADO's members have worked to encourage economic development and create private sector jobs in rural communities and we have always welcomed active participation by our colleagues in Extension.

The development districts and councils of governments who are NADO members are locally-controlled multicounty planning and development organizations serving rural and small metropolitan governments and businesses throughout the country. From their founding in the 1960's these organizations have been based on involvement of the public and private sectors in local-regional-state-federal partnerships designed to improve rural economic conditions. Today, they are a vital part of the "institutional infrastructure" in most rural communities. The professional staff expertise they provide is not otherwise available to part-time volunteer locally elected officials of rural governments.

While most rural-oriented attention in Washington is focused on agriculture, NADO and our members have long understood the importance of nonfarm employment to the economic well-being and indeed *survival* of rural America, including small farmers. Manufacturing is the dominant economic base in rural areas, accounting for over 36 percent of personal income and nearly 40 percent of employment in 1984. The farming sector provided only 12 percent of personal income and nine percent of the employment in 1984. The recent decline in both farm population and nonfarm jobs is leading to an overall decline in rural residents in many states as young people migrate to major metropolitan areas to seek employment.

To be concerned primarily with nonfarm rural America is not "anti-agriculture" but rather "pro" economic diversity and equality of economic opportunity for all our citizens. During the past 20 years substantial public investments helped bring about urban and suburban renewal. NADO's members believe that there needs to be a continuation of the federal-state-regional-local financial and professional partnership. Rural residents should have the same opportunities for revitalization that metropolitan communities have had.

Members of the Joint Economic Committee noted in 1986, "...rural residents have lower incomes...fewer job opportunities, higher joblessness rates and are more likely to be in poverty or live in substandard housing. These conditions are cause for significant federal assistance, yet rural areas receive a disproportionately small share of federal programs."

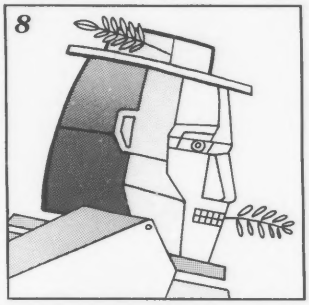
These facts are not news to those who are involved in rural economic development. But the rural development community must work harder at broadening understanding of the realities of rural America rather than fostering the myths, including the image of rural America as solely agricultural. The recent efforts of Extension and the Economic Research Service to study and disseminate information on nonfarm rural America are important contributions to this better understanding by our national policymakers.

NADO hopes that the focus of this issue of ***Extension Review*** on economic development signals the beginning of a national effort to bring about revitalization and job opportunities in rural America.

(Continued on page 43)

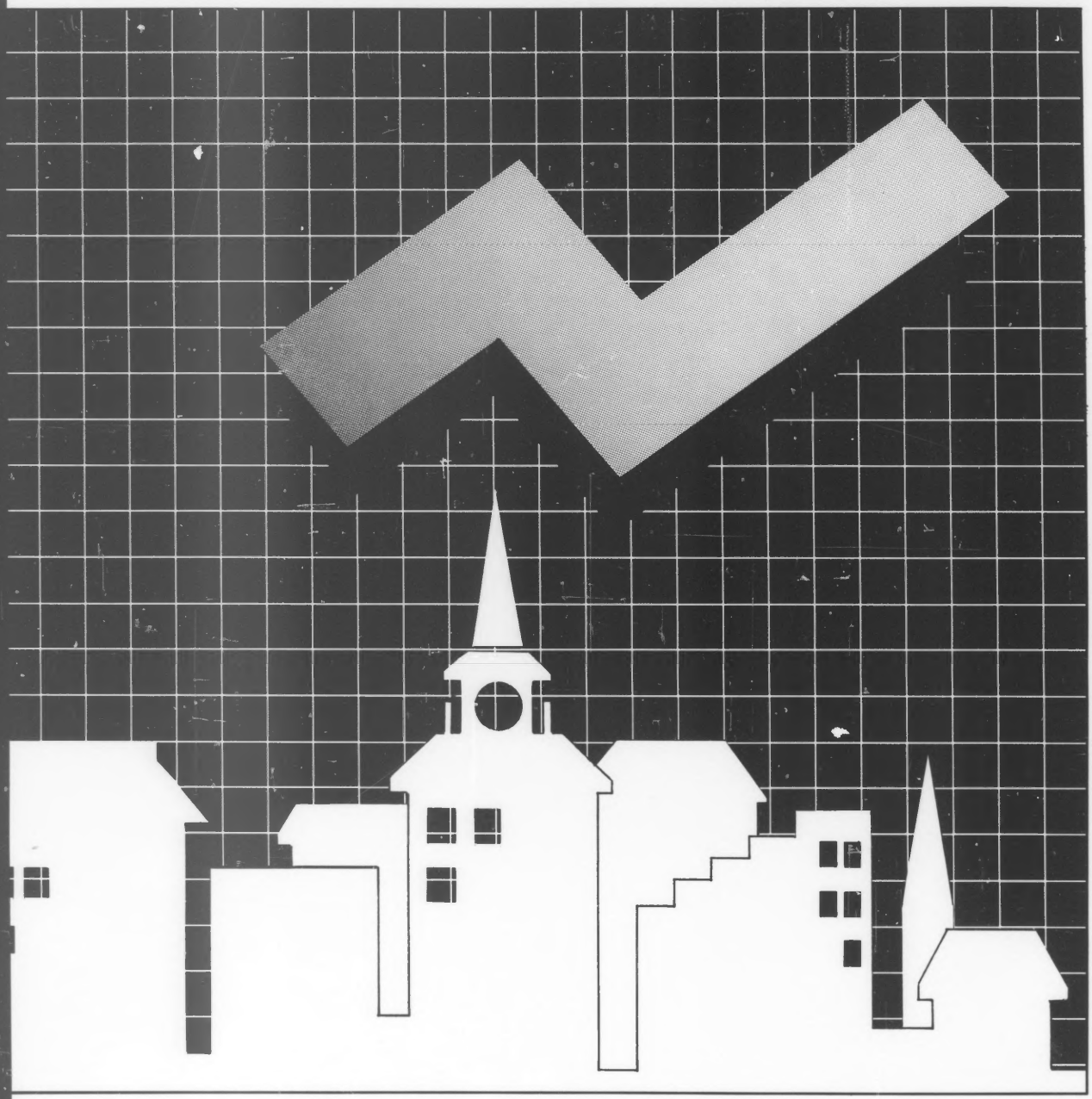
Vol. 59, No. 1
Winter 1988

Extension Review



The **Extension Review**, quarterly publication of the Extension Service, is for Extension educators in county, state, and USDA agencies. The Secretary of Agriculture has determined that the publication of this periodical is necessary in the transaction of the public business required by law of the Department. Use of funds for printing this periodical has been approved by the Director of the Office of Management and Budget. The Review is issued free by Law to workers engaged in Extension activities. For sale by the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402. Send manuscript inquiries to: Editor, Extension Service, USDA, Information & Communications Staff, Room 3428-S., South Bldg., Washington, D.C. 20250. Telephone (202) 447-4651.

Extension Education For Economic Development



The Cooperative Extension System is providing assistance our Nation's communities need to achieve their economic development goals. This economic development involves cooperation between the public and private sectors to create jobs, income, and government revenues. At the same time, communities, with the help of Extension, seek to achieve this development while maintaining concern for clean air and water, open spaces, and good schools.

Extension is improving its ability to deliver economic development programs. Last spring, nearly 500 Extension professionals from 34 states participated in a national audioconference on community economic development. Training at this conference included educational videotapes, handbooks, and a live panel discussion aimed at teaching Extension professionals a comprehensive approach to economic development.

Economic Development Projects
The following are some examples of Extension education projects across the Nation related to economic development:

• In September 1987, the Rural Information Center (RIC), located at the National Agricultural Library (NAL), Beltsville, Maryland, which will serve as an information and referral service for rural local officials, opened with demonstration phone calls from local officials in St. Joseph, Missouri, and Jessup, Georgia. The RIC is a joint program of NAL and Extension Service, USDA, and is accessed through county Extension offices. Two priority areas for the new Center are economic development and local government.

• The Ohio Cooperative Extension Service trains "retention and expansion" consultants who work with owners of local businesses to help them solve problems affecting their business survival and expansion.

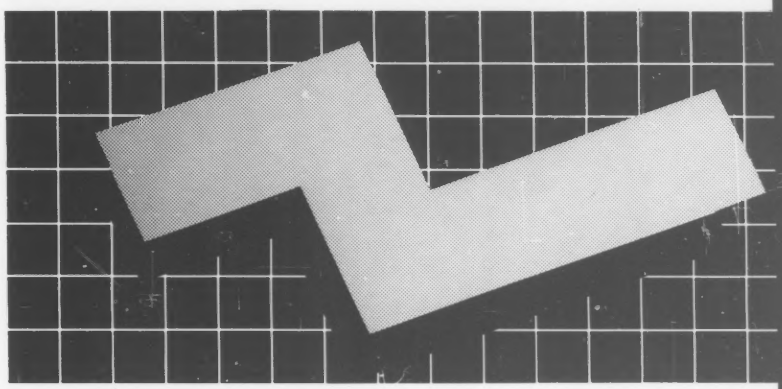
• In Decatur County, Georgia, Ernest S. Purcell, then county Extension director, was part of a delegation that convinced a Chicago-based peanut processor to relocate to that county. In January 1987, a groundbreaking ceremony for the 20,000-square-foot plant initiated a $10 million investment. Approximately 200 local citizens will be employed by the new plant.

• In the four "foothill" counties in California west of the Sierra's (Amador, Calaveras, Mariposa, and Tuolumne), an Extension pilot education program conducted by the University of California to develop home-based industries and small businesses has assisted over 250 different business operations in startup, management, and marketing. Extension is currently distributing a followup questionnaire for business participants in the education workshops held in Calaveras, Mariposa, and Tuolumne Counties, reports Nancy Feldman, Extension area home economist for the three counties.

• At Cornell University, in Ithaca, New York, Extension specialists in biotechnology are working with the owners of over 100 biotechnology firms throughout the state. Their objective is to link these firms with basic and applied researchers at Cornell University as well as with researchers at other centers for advanced technology in the state.

• In February 1986 in Lincoln County, Nevada, Extension conducted a workshop in small business education for leaders in the business community. As a result, a small chain of variety stores has been established at various locations in the county and new businesses are planning to relocate there.

Beth Walter Honadle
National Program Leader,
Economic Development,
Extension Service, USDA



• In Dushore, a small community (population 700) in Sullivan County, Pennsylvania, David Kinsey, county Extension staff, worked with William Gillis, Extension state specialist, to assist volunteer leaders in revitalizing the downtown area. Following this effort, 10 new businesses opened in the area.

• At the University of Wisconsin, Madison, Extension conducts a variety of economic development programs for business. A survey conducted by the Small Business Development Center in Madison for 1983-84 revealed that Extension efforts for that period resulted in increased sales of $10.7 million. Also, during this period there were 1,515 new enterprises, 2,373 new jobs, and an expansion of 1,010 enterprises.

• Extension at the University of Illinois has initiated the training of community volunteers in economic development strategies and techniques.

All Extension program areas are making important contributions to economic development that will inevitably lead to increased prosperity in distressed communities. ▲

Wisconsin: Where Rural and Urban Revitalization Meet

Ayse C. Somersan
Extension State Program Leader, Community, Natural Resource and Economic Development
University of Wisconsin, Madison

On the surface, more than distance seems to separate the small Wisconsin village of Tigerton (population 900) and the state's sixth largest city, Wauwatosa (population 60,000). Yet, positive economic development efforts in both communities are proving that community economic analysis programs of Extension at the University of Wisconsin can work in all Wisconsin communities, regardless of their size and location. More than 60 Wisconsin communities have participated in economic analysis programs led by Glen Pulver and Ron Shaffer, both Extension specialists at the University of Wisconsin, Madison. But in some ways, both Tigerton and Wauwatosa posed real challenges to this successful university Extension program.

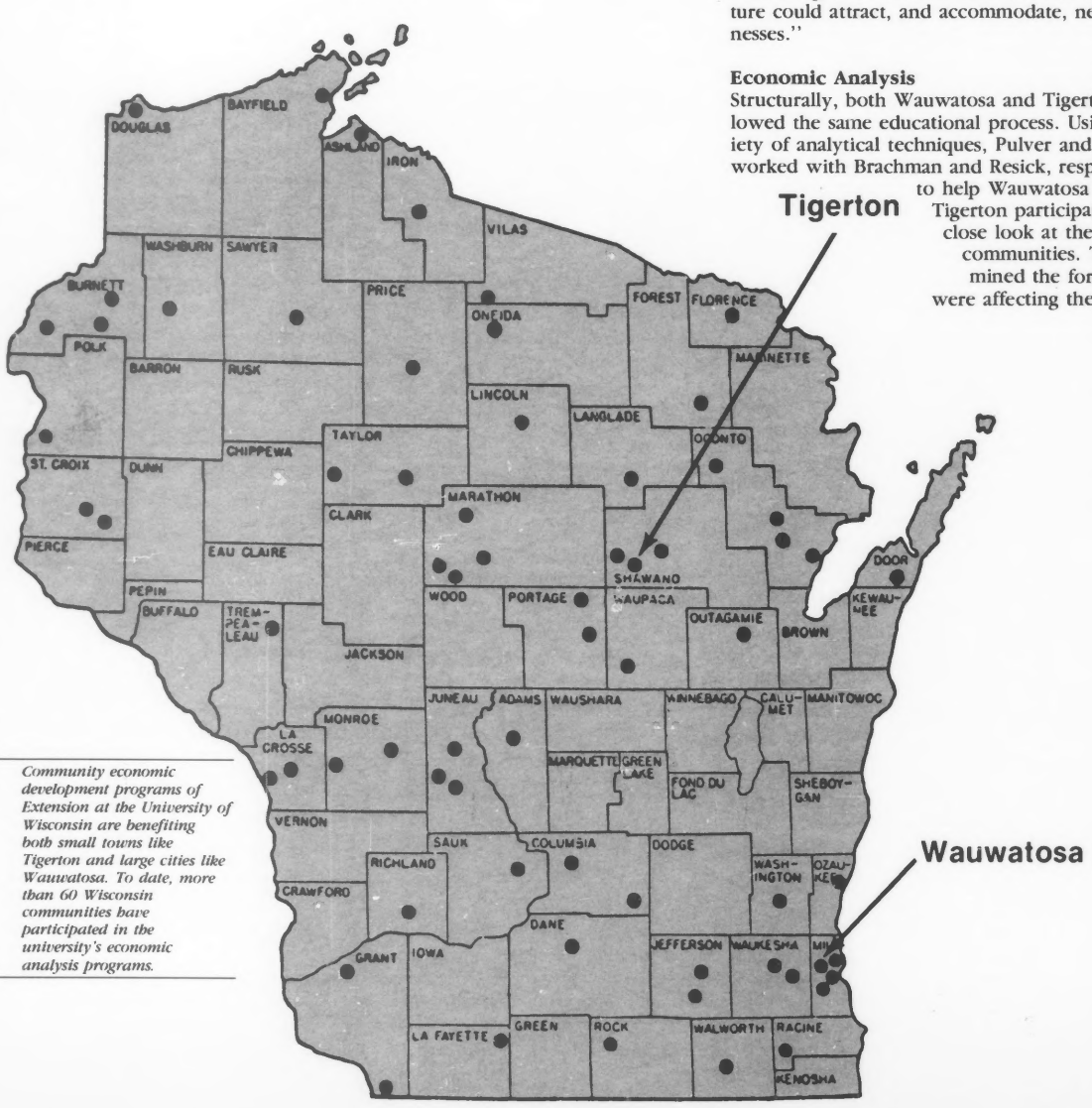
Contrasting Approaches

"Wauwatosa is a highly sophisticated, highly developed city located in the most urbanized part of the state," notes Milwaukee County CRD Agent Steve Brachman. "Local leaders were as concerned with developing an agenda that would help to maintain a solid economic base as they were with developing one that would bring in new industry."

By contrast, Tigerton had to start with the basics, according to Jim Resick, Shawano County CRD agent. "Tigerton had some major infrastructure needs—sewers, sidewalks, and roads—that demanded attention," says Resick. "Even before any significant economic development could occur, Tigerton had to ensure that its infrastructure could attract, and accommodate, new businesses."

Economic Analysis

Structurally, both Wauwatosa and Tigerton followed the same educational process. Using a variety of analytical techniques, Pulver and Shaffer worked with Brachman and Resick, respectively, to help Wauwatosa and Tigerton participants take a close look at their communities. They examined the forces that were affecting their econo-



Community economic development programs of Extension at the University of Wisconsin are benefiting both small towns like Tigerton and large cities like Wauwatosa. To date, more than 60 Wisconsin communities have participated in the university's economic analysis programs.

mies and explored strategies for improving job and income capabilities. In each case, the community economic analysis was recognized as the primary reason for the development of stronger communication among local leaders.

"The community economic analysis almost single-handedly bridged the communication gap among leaders in Tigerton," explains Jeff Gillis, a member of the Village Board of Trustees and a catalyst in Tigerton's revitalization. "The process helped generate a willingness on the part of Tigerton's public and private sectors to work together."

The Wauwatosa Chamber of Commerce cosponsored that city's community economic analysis. According to Bill Tetzlaff, the Chamber's executive director, "While we had undertaken studies and made plans before, this time it was different, thanks to Steve Brachman and Glen Pulver. Not only did they reaffirm some of the planning that we were doing, but they also provided some much-needed focus for our efforts."

A Transition Community

Tetzlaff's comments are echoed by Wauwatosa City Planner Gordon Rozmus. "The city of Wauwatosa is 98.2 percent developed," observes Rozmus. "Thus, we're not actively recruiting major manufacturers whose space needs we could not accommodate. Rather, we see ourselves as a transition community where an expanding business can grow and develop for a few years and then perhaps move on. What we are actively seeking is quality development which can best utilize our strong infrastructure, location, access, and quality of life."

The concept of a "transition" community was one of several outcomes of the Wauwatosa community economic analysis. In addition, local leaders agreed to: prepare a comprehensive economic development plan, create a private/public group to advocate local development, develop and implement a marketing plan and a major conference and meeting center, publish a promotional brochure, analyze present businesses to stimulate their growth, and create a Greater Wauwatosa Committee.

As a result of the community economic analysis, Wauwatosa Mayor James Brundahl has convened his own economic development committee to look at the issues raised during the community economic analysis.

"Right now, two subcommittees are looking into the issues of employer retention and database collection, and I expect these two elements will play an important part in the design of a Wauwatosa development plan," says Brundahl.

Business Recruitment

Economic development is taking a different design in Tigerton. According to Dennis Dehne, president of the First National Bank of Tigerton, water and sewer issues are currently receiving attention, but attracting new business is still a major priority.

"We'll be focusing on businesses that can best match the resources of Tigerton," says Dehne. "Right now, forestry is just such an industry."

Dehne credits CRD Agent Resick for much of Tigerton's renewed excitement and enthusiasm. "He's been very helpful and very informative," he adds.

Regional Development

Like Jeff Gillis, Dehne believes that part of the economic development thrust in Tigerton and Shawano County will be a regional one. "Recently, a banker in Marion, Wisconsin (about 20 miles southeast of Tigerton), referred a prospective firm to me," Dehne says. "This kind of cooperation is happening throughout the area."

"If our efforts here result in new employment opportunities in nearby communities like Wittenberg, Marion, and Gresham," adds Gillis, "then we all will be beneficiaries. That's what has been so helpful about the community economic analysis—Tigerton leaders now see themselves as part of a larger economy and are now making decisions from this new perspective."

New economic development perspectives are abundant in Wisconsin, thanks to the community economic analysis efforts of Extension at the University of Wisconsin. As Wauwatosa embarks on business retention strategies and promotes its tourism potential, and as Tigerton stabilizes its infrastructure and begins to attract new businesses, it seems apparent that urban and rural economic revitalization interests can—and do—coincide. ▲

Extension: Catalyst For Growth

Ralpb F. Webrmann
Extension Business and Industry Specialist,
University of Missouri
Saint Louis County Extension Center
Clayton,
Missouri
and
John M. Amos
Professor Emeritus,
Department of Engineering Management
University of Missouri—Rolla

In St. Louis, as in the Nation as a whole, large corporations have reduced their employment. But total job opportunities are increasing because small businesses are expanding or being established. These small businesses are the primary focus of the University of Missouri's effort to stimulate economic growth through Extension education.

Intellectual Property

For 14 years, Missouri inventors, entrepreneurs, and small business owners and managers have looked to an annual Extension-sponsored conference for advice on protecting and profiting from their creative efforts. Popularly dubbed the "Patent Conference," the educational session covers legal and business factors concerning all forms of intellectual property—patents, trademarks, copyrights, and trade secrets.

The conference, which meets in St. Louis, is a cooperative effort between the Business and Industry category of University of Missouri Extension and the Continuing Education component of the School of Engineering, University of Missouri-Rolla.

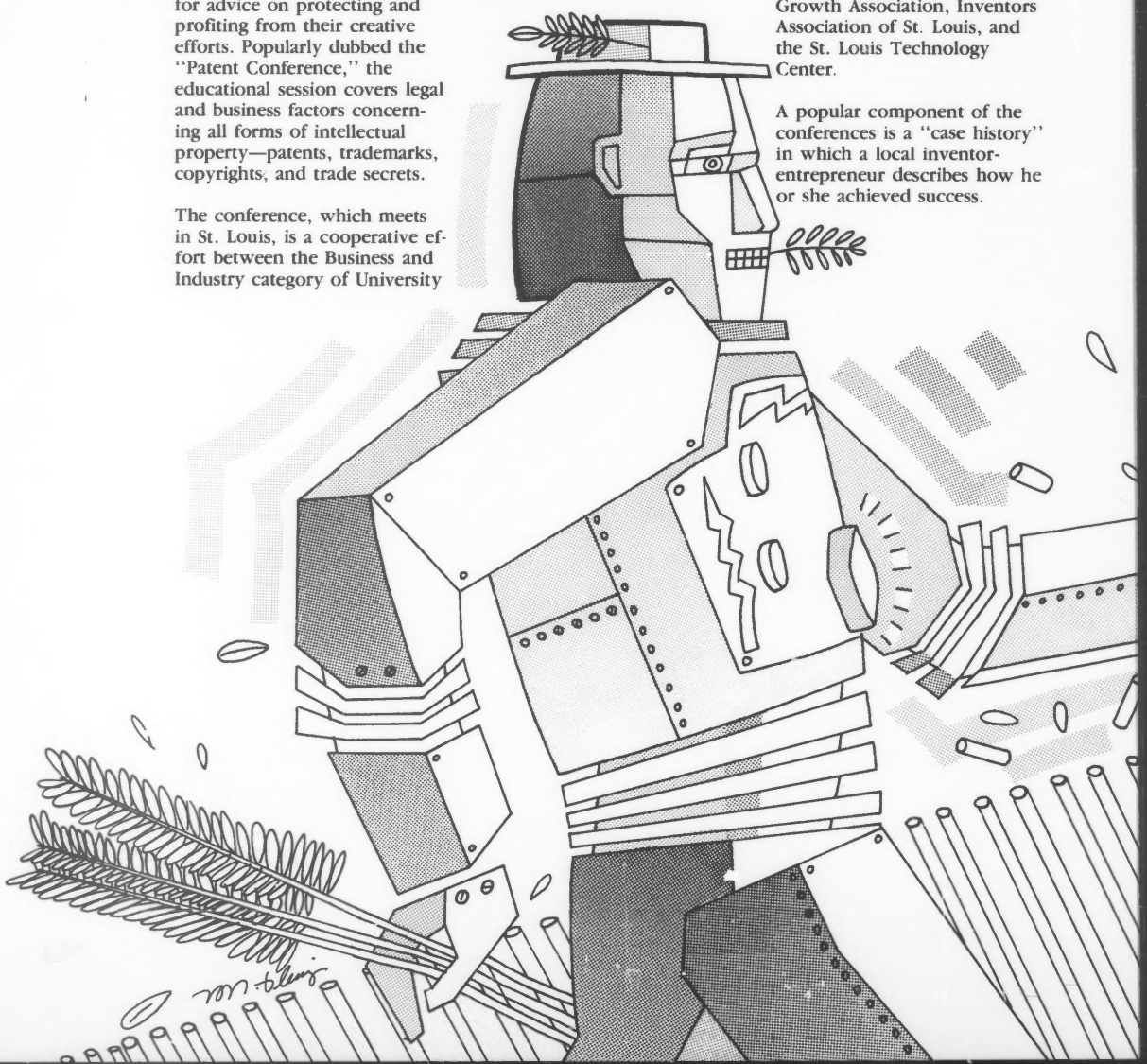
Interdisciplinary Participation

From the inception of the program in 1974, Extension knew that adequate treatment of the subject matter would require the expertise of attorneys. They readily enlisted the help of local patent attorneys, both from private practice and from the St.Louis-based Monsanto Company, at least four of whom have spoken at each conference.

The U.S. Commissioner of Patents and Trademarks was the keynote speaker at the first conference, and either the commissioner or his designee has addressed each of the subsequent sessions. The interest by local media in the commissioner's appearance has created excellent publicity for the conference.

The U.S. Small Business Administration is also a sponsor. Others include the Missouri Division of Community and Economic Development, Small Business Councils of the St. Louis Regional Commerce and Growth Association, Inventors Association of St. Louis, and the St. Louis Technology Center.

A popular component of the conferences is a "case history" in which a local inventor-entrepreneur describes how he or she achieved success.



The format and agenda of the St. Louis presentations have come to serve as a model for local, regional, and national conferences concerned with creativity, invention, and entrepreneurship. The conferences also spurred the development of the 700-member Inventors Association of St. Louis, which helps people find ways to transform their ideas into commercial realities.

Small Computers

When small computers appeared in the late 1970's, Extension began sponsoring conferences and "hands-on" workshops to help business and industry people learn about this new technology. Instructors included university faculty and experts from the computer industry, and St. Louis vendors cooperated by supplying the equipment and software.

Robotics

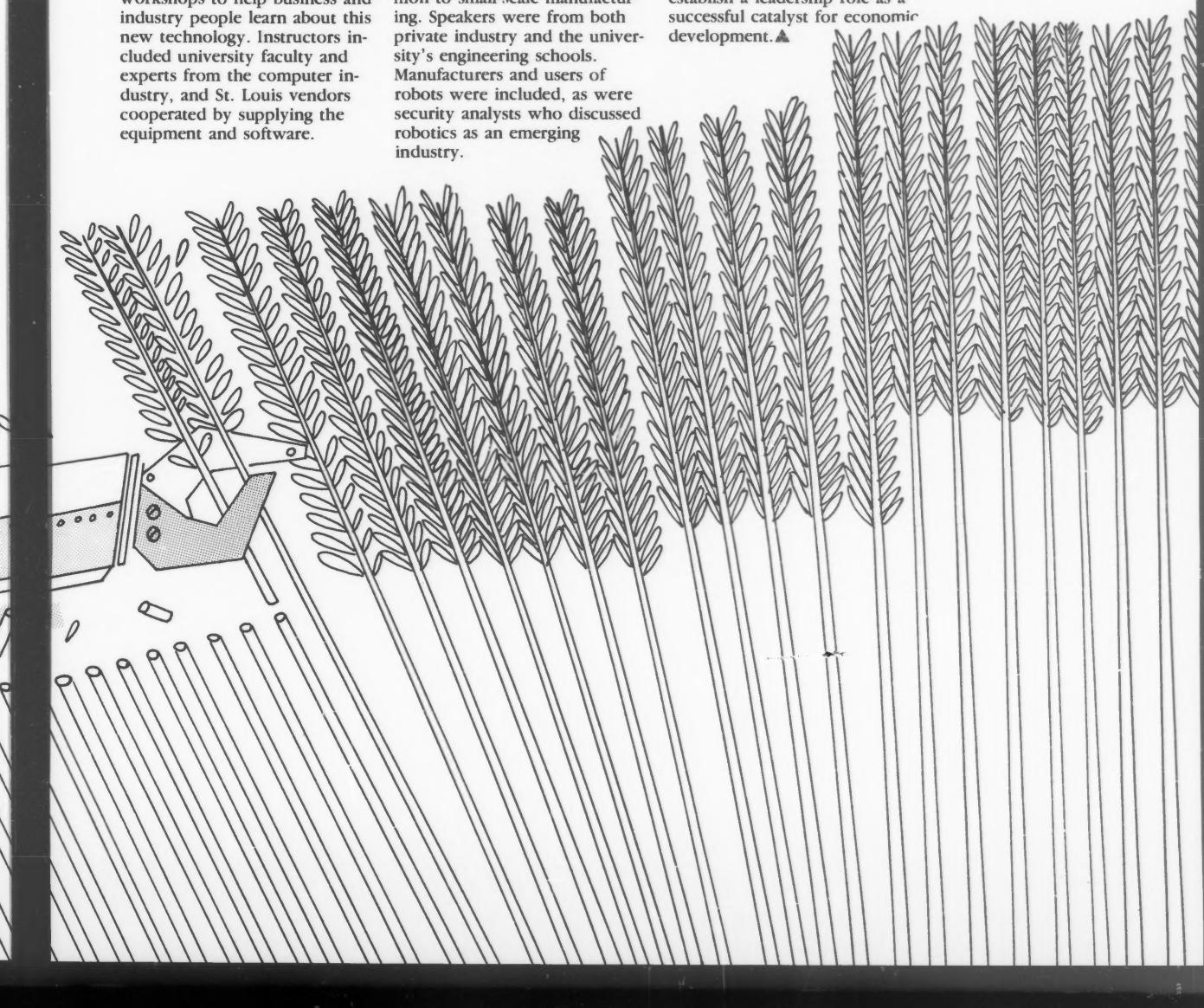
About 10 years ago, the use of robots for manufacturing applications started attracting serious attention. Although large corporations led the way in the practical application of robotics, other firms also became curious about the role this technology might serve.

In the early 1980's, Missouri Extension conducted a series of educational programs to help owners and managers of smaller companies understand the nature of robotics and its possible application in at least some of the processing common to small-scale manufacturing. Speakers were from both private industry and the university's engineering schools. Manufacturers and users of robots were included, as were security analysts who discussed robotics as an emerging industry.

Meeting Business Needs

Although these three subject-matter areas are concerned with state-of-the-art technology, Missouri Extension is involved with a broad spectrum of business needs. The educational programs cover management, finance, productivity, marketing, personnel, legal matters, taxes, and governmental regulations. In addition to conferences, workshops, short courses, and seminars, Extension provides one-to-one counseling.

Over the past two decades, this combination of activities has enabled Missouri Extension to establish a leadership role as a successful catalyst for economic development.▲



FRED: Colorado Key To Business Development

Katherine Timm
Extension 4-H, Youth Editor
Colorado State University,
Fort Collins

In LaPlata County, Colorado, Rick Gruen, Extension agriculture/horticulture agent, developed the program for Functional Rural Economic Development (FRED) to promote integrated economic development. Gruen was inspired by the efforts of the Extension program in El Dorado County, California.

"The integration of agriculture, business, and tourism is the key to maintaining a strong local economy," says Rick Gruen, Extension agriculture/horticulture agent, Colorado State University, LaPlata County. "The support of local agricultural goods and services in conjunction with the business and tourism opportunities that already exist is a critical first step toward the revitalization of Colorado's rural communities."

Gruen developed a comprehensive program for Functional Rural Economic Development—or FRED—as a means of promoting the idea of integrated economic development.

FRED, Gruen points out, is designed to improve the economy by attracting complementary business, capturing existing markets, developing new markets and producers, improving the efficiency of existing businesses, and reacquiring dollars lost in taxes.

"The main ideas of the Extension program in El Dorado County, California, were the inspiration for FRED," Gruen notes. "That program showed that tourists must be offered diversity to be attracted to an area and thus improve the local economy."

Resolution

In September 1987, the LaPlata County Board of Commissioners approved a resolution to facilitate the integration of the agriculture, business, and tourism sectors within the county. The board also made a commitment to stimulate economic development efforts by establishing a regional revolving loan, cross-sector recognition, and education.

In addition to the Board of Commissioners, FRED is receiving support from Durango Area Chamber Resort Association, the Hotel/Motel Association, the Restaurant Association, the Durango Herald, and the Office of Local Affairs. Also backing the program are many area business proprietors, ranchers, and farmers.

Recently, in LaPlata County, locally grown food donated by area producers was prepared and served—during a promotion dinner named "A Taste of LaPlata County"—to more than 425 people, including Colorado Governor Roy Romer, Tim Schulz, director, Office of Local Affairs, and several legislators.

Tapping Into Tourism

Rural producers have begun charging for use of their land for hunting, fishing, and cross-country skiing. Others are charging people for the experience of working on a producing ranch or farm. The next phase of FRED involves producing and distributing a rural ranch and farm recreation guide.

Getting The Message Out

Extension agents can increase acceptance of economic development programs in agricultural communities, according to Rick Gruen, Extension agriculture/horticulture agent, La Plata County, Colorado. "Extension agents need to market their programs," Gruen says. "Agents need to share ideas, listen to feedback from their counties, and then attempt to fill needs so the program as a whole is well received. This acceptance must come not only from the agricultural community but also from the business community and local and state governments."

Gruen, who successfully launched an economic development campaign in LaPlata County, believes involvement on the part of many organizations is essential. "For our program to succeed," he says, "we needed the participation of representatives of the Southwest Economic Development District, the Office of Local Affairs, Fort Lewis College, the Economic Development Council, and many other local and state offices."

Reaching Producers

Gruen thinks that the message Extension agents need to communicate to producers is that economic development can benefit them directly. "Many producers believe that economic programs benefit only urban areas," Gruen says, "while at least part of the funding is generated in rural areas. When LaPlata County recently expanded its airport many producers felt the expansion cost them more in tax dollars, yet they did not personally gain from the investment. You can't argue with that viewpoint. And yet, if agents work with producers who want to try something different such as a bed and breakfast establishment, every plane load of tourists become potential clients.

"Discussing the concept of economic development in terms of personal economic gain places it in a more positive light," Gruen emphasizes, "and makes it more palatable to producers."

"Producers are looking to expand their operations," Gruen says, "to tap into the tourism experience. They are discovering that a ranch is a new environment for tourists who are willing to pay money to pick beans or ride horses. At the same time, hotel and motel operators hope to expand their businesses. Working ranches—not dude ranches—will give tourists an opportunity to experience life on a farm."

LaPlata County, Gruen believes, is gaining statewide attention because of the efforts of local citizens to develop programs that strengthen ties among the agriculture, business, and tourism sectors. "We believe we can provide common goals for the community," he says, "by implementing programs that promote cross-sector recognition and obtain benefits through integrated rural economic development." ▲

Katherine Timm
Extension 4-H Youth Editor,
Colorado State University,
Fort Collins

Many local residents (left) were among the 425 people attending "A Taste of LaPlata County"—a dinner promoting food grown by area producers. Colorado Governor Roy Romer greets guests before delivering a talk on economic development.

Sowing The Seeds Of Economic Development

Diane Banegas
Student News Writer, Agricultural Information
University of Nevada-Reno

Tom Harris, associate professor of agricultural economics, worked closely with Barbara Gunn, Extension family economics and management specialist, both of the University of Nevada, Reno, on a study of emergency medical services and indigent health costs which used Humboldt County as a model. Their efforts facilitated the passage of an Indigent Accident Fund bill which lessens the financial burden on Nevada's rural counties.

In late August 1986, a 19-year-old motorcyclist traveling on U.S. Highway 95 through Humboldt County, Nevada, crashed his bike and suffered massive head injuries. He was taken to Humboldt General Hospital and 2 hours later transported to Washoe Medical Hospital in Reno where he died after 1 week. Emergency medical services totaled $42,000. The motorcyclist was an indigent.

Under Nevada state law, if a patient or the patient's family is unable to pay for emergency medical services, the hospital may bill the county where the accident occurred. Three years ago, Humboldt County managers would have had no recourse but to use county treasury funds to settle the bill. Today, as a result of efforts by Nevada Cooperative Extension and the Office of Rural Health at University of Nevada-Reno, (UNR), an indigent fund exists in the state, removing a heavy financial burden from Nevada's economically depressed rural counties.

Indigent health costs had been a problem for Nevada counties for some time when the Office of Rural Health, at University of Nevada-Reno, and Nevada Cooperative Extension pooled funds and commissioned Tom Harris, associate professor of agricultural economics, and Barbara Gunn, Extension family economics and management specialist, both of UNR, to study emergency medical services and indigent health costs.

Harris and Gunn used Humboldt County, a rural community, as a model. Their study revealed that emergency medical care for indigents was a financial drain on Nevada's counties—including Clark and Washoe—but especially affected rural counties, which have a smaller tax base from which to draw funds.

Indigent Accident Fund Bill

An outcome of this study was the passage of Assembly Bill No. 218, which established the Indigent Accident Fund through an *ad valorem* tax. This is one example of how economists at the College of Agriculture, UNR, are working to help rural Nevadans survive during current hard times.

As an agricultural economist, Harris believes helping rural Nevadans is an important part of his research for the college. He initiates research projects himself, or, as in the case of indigent health care, a study may be requested by an outside source. "We get quite a few calls from Extension faculty," Harris says. "They know firsthand what the needs and problems of their communities are. They serve as liaisons between clients and researchers at the college."

Fiscal Officer Robert Hanks of Lander County contacted Harris through Extension's Community Resource Development Program needing facts to develop new industry in the area when Battle Mountain and other communities had suffered setbacks due to mining shutdowns. Harris conducted a two-part study assessing the business community and the labor pool. Harris' study revealed existing zoning laws in Battle Mountain might be unfavorable in attracting new industry.

Collecting A Database

In Pahrump in Nye County, county officials asked Harris and Michael Mooney, state Extension specialist, economics, to conduct a Community Atlas Survey to determine if the community was attracting an older populace. This type of survey gives community decisionmakers an information database in areas such as age and sex distribution, community attitudes and priorities. The survey revealed that the age 55 and older population had increased from 33 percent in 1975 to 42 percent in 1982. These facts were included in a community brochure developed by Harris and Mooney that enabled the community to lobby successfully for a health care clinic to be built in their area.

"Mooney has always been available and helpful to any economic concerns in the rural areas," says Kenneth Redelsperger, state senator, central Nevada senatorial district, and a resident of Pahrump. "He has always been willing to make the resources of Extension at the university available. This is extremely important for the rural areas because we don't have resources of that nature available to us."

Workshops For Revitalization

To help rural towns accomplish economic development without new industry, Harris has participated in the Small Business Education Workshops at Oregon State University. These workshops were sponsored by the Western Rural Development Center there and by Extension services in 13 western states.

The workshops, Mooney points out, are part of a nationwide Extension effort to revitalize rural America. They were created to educate and inform rural westerners of business opportunities available in their own communities. After a Small Business Education Workshop in Caliente, the town developed an economic development council. Michael Mooney has been a guiding force in the creation of the committee.

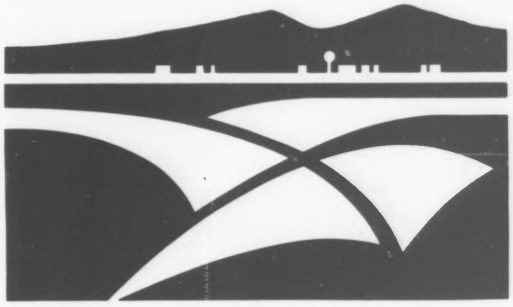
Rural people who have traditionally relied on farming, mining, or another resource-based industry, often face obstacles when attempting to establish new businesses as a primary or supplementary source of income. They may lack the skills and information needed to develop a viable business plan or prepare financial statements when approaching money lenders. Skills in management, marketing, and customer relations may also be lacking.

By participating in the workshops, Harris and Mooney helped local Extension agents work with chambers of commerce to develop and evaluate surveys of merchants and customers. "Evaluations of the workshops were favorable," Mooney says. "People who missed the first workshop kept calling us back for more information."

Harris contributed substantially to the 1985 State Plan for Economic Development and Diversification with a thorough analysis of rural needs. "Nevada's whole economic development program is based on the plan," says Andrew Gross, executive director, Nevada Commission On Economic Development. "The state's economic development plan is nationally recognized as one of the best in the country. Tom Harris gave us a lot of insight and assistance. He is probably more responsible for the analysis and organization of the rural economic development proposals than anyone."

Harris and his Extension associates continue giving rural Nevadans educational and other forms of assistance to help them not only survive but thrive in their communities.

Extracted from an article in **AGFORUM**, a quarterly newsletter published by the Agricultural Information Office, College of Agriculture, University of Nevada-Reno.



Revitalizing Rural America

Food And Fiber Center—Processing For Added Value

Barry W. Jones
Extension Managing Editor, News,
Mississippi Cooperative Extension Service
Mississippi State, Mississippi

While Mississippi has long ranked with the best among food and fiber producing states, it has lagged far behind in processing raw products into consumer-ready goods.
To work on reversing that trend and to capitalize on projections that beyond-the-farm-gate activities will grow in importance to the Nation's economic health, the Mississippi Cooperative Extension Service established a Food and Fiber Center in 1974. The mission: to provide "added value" to the state's economy through new and expanded processing and marketing of Mississippi's agricultural, aquacultural, forestry, and marine products.

Keeping Dollars At Home
By the 1980's, Mississippi's long-standing problem of keeping dollars at home was confronting the Nation as a whole. As a result the Food and Fiber Center has become a testing ground for programs other states, and perhaps the Nation, will need to capture a greater share of processing, marketing, and distribution dollars.

"It is expected that roughly three-fourths of the retail value of food, fiber, and forestry products (up from two-thirds in 1984) will be represented by processing, marketing, and distribution activities by the beginning of the 21st Century," said former Secretary of Agriculture John Block in 1984. "The beyond-the-farm-gate sector of the U.S. economy will become increasingly critical to national employment, the inflation rate, and the balance of payments."

Because so much of Mississippi's farm production is shipped out of state for processing, Mississippi agribusiness leaders have recognized the positive impact that further processing could have on the state's economy.

If all of Mississippi's $3 billion dollars' worth of farm production, with an estimated consumer-ready value of $15 billion, could be processed in-state, Mississippians might realize another $12 billion each year and bring economic growth and stability to one of the Nation's poorest states.

Successful History
In 13 years the Food and Fiber Center has enjoyed some dramatic successes—creating thousands of new jobs, introducing numerous new food products into the marketplace, and saving hundreds of thousands of dollars for agribusinesses through improved management, production, and marketing.

"Adding value to our agricultural and forestry products will continue to be a broad and challenging area for us," says Joe McGilberry, manager of the Food and Fiber Center.

Unlike traditional economic development organizations, which most states have, the Food and Fiber Center has sought to focus its activities on expanding and enhancing agri-industries and agribusinesses already located within the state.

Information For Decisionmaking
McGilberry points out that the center's accomplishments have come mainly through the staff's ability to focus on providing information for decisionmaking purposes to entrepreneurs and leaders within Mississippi firms and industries.

"We work with all segments of the food and fiber processing and marketing system," he says.

This means the Food and Fiber Center staff is deeply involved in educational activities with industries such as seafood, poultry, beef, catfish, forestry, feed and grain milling, vegetable, fruit and nut operations, speciality food products, and furniture manufacturing.

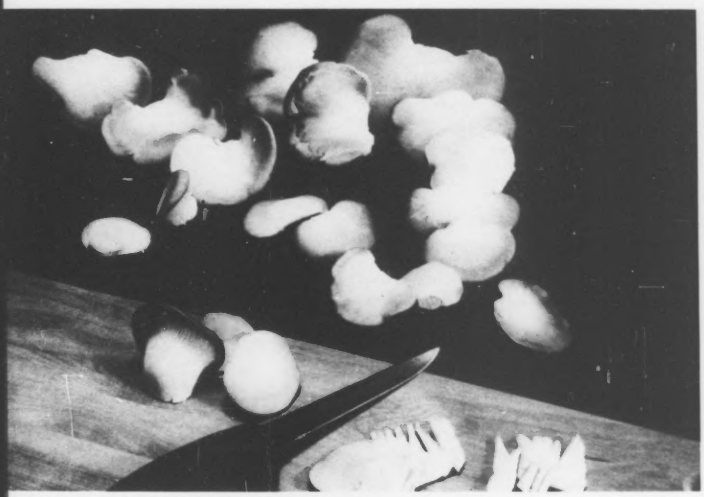
To meet the needs of these diverse industries, the center maintains a multidisciplinary staff of specialists. Staffers also can call on the expertise of others within Extension and on the faculty resources of the Division of Agriculture, Forestry, and Veterinary Medicine at Mississippi State University.

Support For Agribusinesses

Food and Fiber Center staff members have so far provided support for agribusinesses in five broad areas: new ventures, business management, homegrown industries, new product development, and economic development.

The center has supported new ventures by offering feasibility studies and economic analyses intended to chart a more certain course for agribusinesses or individual entrepreneurs willing to try new ventures.

In the area of business management, the center staff provides services in areas such as business plan development, economic analysis, financial controls, in-plant productivity improvements, waste control and use, and market analysis.



By providing this support, the center helped a seafood processing firm avoid bankruptcy and provided information to corporate decisionmakers who doubled the capacity of a catfish processing plant and brought about 250 new jobs to Mississippi.

Similar business management help has been provided, McGilberry notes, to numerous industries involved in processing and packaging.

New And Improved Products

Center activity with homegrown industries includes such diverse subjects as product development, packaging, marketing and distribution, and management information systems. The 60 firms and individual entrepreneurs with whom the center worked during a recent 18-month period introduced 31 new products into the marketplace. Work in this area also led to the formation of a Mississippi Speciality Foods Association. The center also supports product development among more traditional agricultural food and fiber processors.

"As a result of this work, three new beef and ham products, four new poultry products, two pastry products, five catfish and seafood products, and three dry mixes have been developed and introduced into the marketplace," McGilberry says.

Four studies relating to the cotton industry have improved the quality and the profitability of ginned cotton for a group of cotton farmers.

Catfish Industry

If one commodity can be singled out to demonstrate how the Food and Fiber Center has aided Mississippi, the farm-raised catfish industry would be the best example. The center has developed techniques and databases necessary for the farm-raised catfish industry to project investment costs and risks and many other needs for potential catfish processing investors.

"We conducted 11 major feasibility studies for catfish processing plants between 1979 and 1986," McGilberry notes. "Four of these plants are now in operation. Total capital investment will be about $26 million, with more than 2,000 new jobs created."

Activities of the Food and Fiber Center have convinced many agribusiness leaders that this one-of-a-kind economic development concept offers a strategic key to solving problems in Mississippi's distressed economy. ▲

Opposite and left: A major goal of the Food and Fiber Center is to find ways to process such Mississippi-grown products as oyster musbrooms, pecans, fish, and bread products in-state. Below: Gladden Brooks, food technologist at the center, helps to develop and introduce new products made from traditional as well as non-traditional raw products grown in Mississippi.

A Home-Based Business— Key To Self-Sufficiency

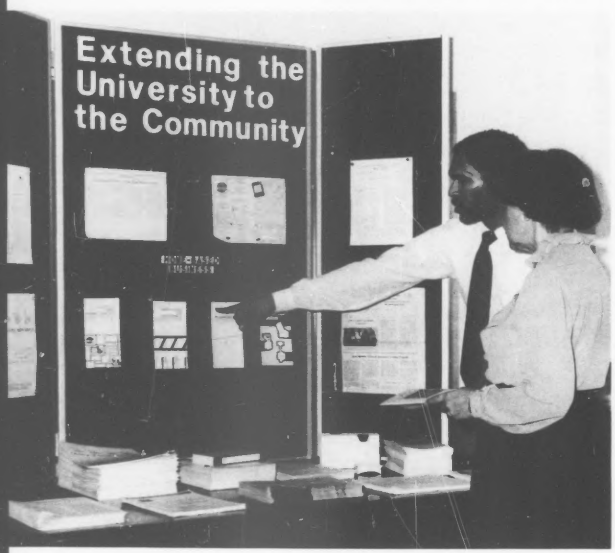
Maurice W. Dorsey, Cochair, Extension Home Economics Agent, Wards 5 and 6, and Marechalniel W. Dennis, Cochair, Extension Home Economics Agent, Wards 7 and 8, University of the District of Columbia, Washington, D.C.

Maurice Dorsey, Extension home economics agent and cochair, Wards 5 and 6, University of the District of Columbia, Washington, D.C., suggests an appropriate business publication for a participant during a 1-day conference on starting a home-based business. The conference was cosponsored by the District's Office of Human Rights and the Minority Business Opportunity Commission.

Although the District of Columbia's 1985 unemployment situation was an improvement over 1983, the 8.5 percent unemployment rate meant that the city still had 27,000 unemployed persons. In Ward 8, the unemployment rate was 13.3 percent, and Wards 5, 6, and 7 also had a higher than average number of job seekers.

The people in these areas of the city needed help in finding ways to earn money to increase their incomes. Extension knew that for some people who had marketable skills and know-how, a home-based business could be a possible alternative.

Many of the more than 1 million people in the United States who have businesses in their homes share some common problems, however: (1) they lack sufficient management skills, (2) they lack marketing skills, and (3) they have difficulty obtaining operating funds. The latter can be a particular problem for women, who often have trouble obtaining credit.



Avoiding Problems

To help people avoid some of these problems while starting a home-based business, Extension home economists planned a 1-day conference, aimed primarily at clients in Wards 5 through 8. Titled "Home-Based Business: A Key to Self-Sufficiency," the event was cosponsored by the city's Office of Human Rights and the Minority Business Opportunity Commission.

Objectives of the conference were to: identify personal goals, understand space needs and legal and financial requirements, understand the importance of marketing knowledge, and learn about available resources.

The agenda included a keynote address by the chair of the City Council's Housing, Business, and Economic Development Committee as well as lectures and workshops focused on starting, organizing, and maintaining a business. Government agencies, the private sector, and nearby colleges and universities provided guest speakers, printed materials, and mass media coverage.

Assessing Capabilities

The conference successfully enabled participants to assess their capability for operating a home-based business, and it prepared Extension agents to do a better job of advising clients about the advantages and disadvantages of this approach to increasing income. Conference-goers met others with similar home-based business interests as well as many resource people to whom they could turn for assistance and information.

Evaluations showed that the most useful part of the conference was the opportunity for "networking" among home-based business owners.

Participants also believed that two days should have been allotted for the conference, and that indepth followup sessions should be held on specific topics.

Participation

Information on the participants' background revealed that 33 percent already owned a home-based business and 37 percent were planning to start one. Of the existing businesses, 66 percent were part-time. Thirty-three percent of the businesses provided partial but substantial support, and 31 percent provided full support. Most of the businesses were in the areas of design, office services, and management consulting.

Future Plans

Wards 5, 6, 7, and 8 of the home economics staff will take active leadership to develop further linkages with the community and both private and public cooperating agencies. Future workshops will focus on expansion efforts with a followup to determine adoption of recommended practices. ▲

West Virginia Targets Unemployment

Supplementing income is essential for many families in West Virginia, the state with the Nation's highest unemployment rate. With Extension's help, some West Virginians are earning additional money by establishing home-based businesses that provide needed services and products.

Custom Dressmaking

In 1981, West Virginia University's Extension Service began providing workshops and seminars on home-based businesses. At that time, Extension at West Virginia University received a USDA special needs grant to fund workshops on custom dressmaking as a home-based business. Over the next 2 years, 261 people from 37 of West Virginia's 55 counties attended nine such workshops.

An interdisciplinary Extension committee planned and conducted the workshops. The group included specialists in business education, business management, consumer education and family management, and clothing and textiles. Two days of each workshop emphasized financial, legal, and other business concerns, and the third day concentrated on the skills needed for custom dressmaking.

Cooperation from professional volunteers was a vital part of the endeavor. Local attorneys, independent insurance agents, representatives from the U.S. Small Business Administration, and a graduate assistant hired under the grant presented parts of the workshops.

A final questionnaire mailed to all participants at the end of the workshop series revealed that 17 of 23 businesses established before the workshops were held were still operating, as were 10 of 11 new businesses started after the workshops. As a result of the grant, by 1984 17 new home-based businesses had been established.

One participant, who has a home-based alteration business, complains good-naturedly, "Business is so great I don't have time for anything but sewing. I have 200 customers and have done as many as 60 garments per person."

As another woman wrote, however, "I've decided that a small business is not for me at this time." Helping people make such decisions was a vital part of the workshops.

Prototype Seminars

In 1984, the success of the custom dressmaking workshops led to the organization of a state home-based business task force (two Extension specialists and three county Extension home economists) which developed two prototype seminars. The seminars had two purposes: (1) to provide a format for Extension agents to follow in helping people plan and implement home-based businesses and (2) to provide information to established and potential entrepreneurs.

The first seminar covered custom crafts, home maintenance, and bed and breakfast operations; the second presented those three plus personal services, dressmaking, and food services. Local entrepreneurs and professionals cooperated in the seminar presentations, as did the Small Business Development Center; State Departments of Commerce, Insurance, and Taxes; Women's Commission; Women and Employment, Inc.; and a private college. More than one-third of West Virginia's county Extension home economists attended one of the two prototype seminars.

Bed and Breakfast

Since tourism is the second largest industry in West Virginia, the task force decided to concentrate next on developing "bed and breakfast" businesses. Many West Virginians have large homes which are ideal for such operations and which are located in areas that have major festivals, fairs, state parks, colleges or universities, and other tourist attractions.

Since September 1986, a team made up of Extension specialists, county Extension home economists, and representatives of the State Department of Commerce have reached about 270 people from 30 counties with 10 one-day workshops on starting a bed and breakfast business. A panel of bed and breakfast hosts participated in nine of the 10 workshops.

Before the workshops, there were 26 registered bed and breakfast businesses in the state; now there are more than 50. With guidance from evaluations of the earlier workshops, Extension planned followup sessions for fall 1987 and spring 1988. Volunteer professionals were scheduled to discuss the business aspects of operating a bed and breakfast, including taxes, management skills, insurance, marketing, networking, recordkeeping, and shopping for loans.

Economic Opportunity

Home-based businesses are indeed an economic development opportunity for West Virginia residents. Extension plans to continue assisting county and multicounty groups as they explore ways to improve this vital part of the state's economy. ▲

M. Kate Clark
Extension Consumer Management Specialist,
Division of Home Economics and 4-H
West Virginia University,
Morgantown

M. Kate Clark, Extension consumer management specialist, at West Virginia University, (left), chats with Ruie Crawford, Lost Creek, West Virginia, about Crawford's bed and breakfast operation. The workshops on home-based businesses provided by Extension at West Virginia University have helped many established and potential entrepreneurs with information vital to their success.

Master Teachers Turn Skills Into Profit

Margaret A. Duffy
Extension State Specialist,
Home-Based Business,
Division of Home Economics
University of Massachusetts,
Amherst

Extension home economists and trained volunteer "Master Teachers" in Massachusetts have reached over 8,000 participants with the Home-Based Business Master Teacher Project. The one-year pilot project, which employed personal counseling, workshops, and other special events, was designed to provide practical start-up help and business basics to those with special skills and talents.

The project emphasized five profit-making businesses: Sewing And Related Arts. Family Day Care, Bed And Breakfast Operations, Food Preparation, and Housecleaning. The objective was to help Extension clientele either start or expand a home-based business, or, decide not to go into business.

Opposite and above: Clientele with skills in family day care and crafts were among 8,000 participants in Massachusetts provided with practical start-up help and business basics by the Home-Based Business Master Teacher Project. This one-year pilot project, featuring a week-long conference conducted by Extension at the University of Massachusetts, resulted in the training of 60 master teachers whose volunteer time was worth an estimated $42,000.

Need For Information

"In the past, home-based business related to home economics was not a major educational thrust," says Elsie Fetterman, state program leader, Extension home economics at the University of Massachusetts. "However, we were surprised to discover that Extension clientele in Massachusetts were already earning an average of $1,500 per year, per household, using home economic skills.

"In addition, our statewide Sewing As A Business conferences were a huge success," adds Fetterman. "This showed us there was a need for more information about how to turn a special skill or hobby into a profit-making business."

The following factors contributed to initiating the Home-Based Business Master Teacher Project: the successful use of the master teacher concept in other Extension areas to train volunteers and thus reach a wider audience; Extension expertise in home economic subject areas and the organizational skills to offer educational assistance in a wide range of business areas; acknowledgement that home-based businesses were becoming an important part of the economy; and the realization that no other educational organization was providing practical start-up help to home-based entrepreneurs with special skills and talents.

Organization And Funding

The Home-Based Business Task Force, consisting of Extension home economists from across the state, first had to organize the 13 participating counties. They needed to identify funding sources, develop resource materials, and recruit qualified master teachers. In addition, project support materials had to be developed as well as evaluation tools.

Seventeen thousand dollars was obtained through university endowment and private sector funding that permitted the training of 15 home economists and 70 master teachers. To provide start-up assistance and business basics, 17 factsheets were prepared in five special home-economic-related areas. (These factsheets were honored in 1986 with an Agricultural Communicators in Education Award for Excellence.)

County home economists, it was determined, would both recruit and supervise their own master teachers. In return for intensive instruction, each master teacher would be required to volunteer 100 hours to aid potential and existing home-based entrepreneurs in their community.

Major Phases

The project had four major phases: A two-day inservice training period for Extension home economists that oriented them toward the subject of home-based business and the "master

teacher" concept; a week-long conference at the University of Massachusetts for supervising home economists and master teachers at which 35 hours of comprehensive instruction were provided on such topics as Developing A Business Plan, Pricing For Profit, Obtaining Financing, and more; a 9-month period where each master teacher worked under the supervision of the county home economist on such home-based business activities as workshop development, organizing network groups, and conducting personal counseling sessions; and the evaluation of the project by the county home economist, the master teacher, and the client.

Selection And Recruitment
The task force developed strong criteria for

selecting and recruiting master teachers. For example, candidates were expected to have a strong interest in home-based business and, preferably, business experience. They were required to have good people skills and carry out the 100-hour volunteer commitment with minimal supervision. As a result, 150 individuals applied to become master teachers but only 70 were accepted into the program.

Project aids developed for the master teachers included radio and cable TV P.S.A.'s, posters to advertise the free assistance, master teacher recognition award certificates, and project evaluation tools.

Project Results
Sixty master teachers successfully completed the training and their 100-hour commitment. The time they volunteered was worth an estimated $42,000.

Over 8,000 Massachusetts residents were reached through more than 200 workshops and special events, one-to-one counseling, and factsheet requests. The project received excellent media attention—coverage included nearly 200 newspaper articles and 46 radio and TV shows statewide.

A followup study was conducted 6 months after the project ended to measure its impact on potential and existing entrepreneurs. Questionnaires were mailed to 1,309 of the 8,000 participating individuals. Eighty-two percent of respondents who answered stated they found the information helpful, 51 percent replied that they were now operating a business in the home (a 12-percent increase), and 43 percent stated they were now earning income (a 20-percent increase). Total dollar earnings by home-business entrepreneurs who participated in the project more than doubled.

Measuring Impact
At present, Extension is examining the feasibility of continuing the Home-Based Business Master Teacher Project. In the interim, however, home economists continue to respond to client needs through workshops, counseling, newsletters, and factsheets.

The effectiveness of the project remains evident from county activity. In Franklin County, Extension helped to organize a professional association of bed and breakfast operators who combine their resources for both advertising and bulk ordering of supplies. In Middlesex County, as a result of the project, master teachers helped to establish a clothing cooperative to provide those with sewing skills an outlet to sell hand-crafted clothing and accessories. In Berkshire County, the project spurred residents to assist in the formation of a business incubator for small business start-ups.

A home-based business that can survive, prosper, and grow will have a positive impact on a vigorous small business community. In Massachusetts, we believe the Home-Based Master Teacher Project achieved that impact when it reached thousands of potential and existing entrepreneurs. ▲

Expanding The Powell River Project

Sherrie R. Whaley
Extension Information Officer,
Virginia Tech,
Blacksburg

Opposite top: Students from Virginia's coal-producing counties visit the headquarters of the Powell River Project where Extension researchers from Virginia Tech find new ways to transform surface-mined land to improve the region economically. Below: Virginia Tech's radio-TV unit interviews Extension animal scientist John Gerken. Above: At the project, Tom Nichols (left), Extension forestry specialist, measures tree growth aided by assistants. Note "highwall" in background left by surface mining.

For over a century, the coal reserves—the "black diamonds"—of southwestern Virginia provided a livelihood for many citizens. However, in recent years, the coal industry labor force has been scaled back as improved production techniques and modern machinery replaced human labor. Faced with high unemployment rates and rising poverty levels in the region, state and local leaders began to look to the land once again for solutions.

Since its creation in 1980, the Powell River project has become a nationally recognized model of cooperation between industry, academia, and government at all levels. Through the project, Extension specialists and researchers from Virginia Tech are searching for ways to transform surface-mined land into productive sites for industry, agriculture, and tourism.

The Powell River Project offers possible answers to the region's dilemma by focusing on a variety of environmental, social, and economic issues. For example, Virginia Tech engineers are studying the effects of erosion and land slope on crop potential and water quality. Horticulturists have planted a variety of crops on mine spoils, including fruit orchards and vineyards. Animal science specialists are employing forages grown on abandoned strip mines to raise beef cattle. Mining engineers are studying the surface effects of underground mining.

Human Resources Study

The human resources of the mining community are also receiving deserved attention. Thomas G. Johnson, Extension rural development specialist at Virginia Tech, recently completed a 3-year study of the quality of life in Virginia's coal region. "The quality of life in the coal-producing counties generally lags behind the rest of the state," Johnson says. "Unfortunately, the gap is growing wider."

Johnson points out that the region's traditional dependence on the coal industry, and its narrow economic base, has an overwhelming effect on quality of life and how coal field residents view the future. Despite improvements in the coal fields, the region leads the state in such categories as suicide, unemployment, percentage of families below the poverty line, and welfare and disability payments.

Without the confidence that their levels of income will remain secure, southwest Virginia residents are hesitant, Johnson found, to invest in either human or physical capital. This failure to invest in the future, he believes, is apparent in many of the region's problems: lower educational achievement; more health problems; and less adequate water, sewer, and road systems when compared to the rest of the state. "The coal region must have this investment," Johnson says, "to broaden its economic base."

Education, Johnson notes, is also of particular importance to the area. Historically, the school dropout rate in the coal-producing counties has been much higher than the state average. Over the past few years this gap has been narrowing.

"The educational level of the workforce is important," Richard M. Bagley, state secretary for economic development, emphasized at the 1987 Powell River Project Field Day. Speaking before 700 students from across southwestern Virginia, Bagley urged the students to "educate themselves both about the coal industry and economic diversification."

Unfortunately, Johnson discovered in his study, the majority of talented students from the coal-producing counties leave the region after earning their degrees.

Easing Economic Hardships

Powell River Project activities, says H. John Gerken Jr., Extension animal scientist and project coordinator, Virginia Tech, are aimed at easing these economic hardships, not only for Virginians but for residents throughout the Appalachian coal states.

"Much of our research is also applicable to mining regions in neighboring Kentucky, West Virginia, and Tennessee," he points out. "We plan to expand our mission to include the confrontation of problems that are common to the entire Appalachian coal region."

Leaders of the Powell River Project recently endorsed an ambitious plan to expand the project and increase its impact on the coal industry and coal communities. The project goals include:

- Increasing the yearly budget of the project from $300,000 to $2 million within a 5-year period.

- Hiring a full-time project director and establishing a Powell River Project field office. (Plans call for the eventual construction of a reclamation center to serve as a clearinghouse for ideas in the Appalachian coal states.)

- Developing an outreach program with workshops and publications to ensure that lessons learned from the Powell River Project are put to work.

- Conducting a heightened information program to educate local citizens about the project and its mission.

Project research has proven that mined land can be effectively reclaimed for numerous uses, while simultaneously providing protection for the environment. Through the use of long-range planning and foresight, leaders of the Powell River Project are shaping it so that for years to come it will remain a force for positive change in the Appalachian coal region. ▲

POWELL RIVER PROJECT

Changing Directions: The Choice Is Theirs

Jane A. Scherer
Extension Program Coordinator, Consumer and Homemaking Education Program
University of Illinois, Urbana

The average worker can expect to change careers three to five times and work for 10 different employers. Whether forced or voluntary, these changes require people to reassess their abilities and enhance their job-searching skills.

In Illinois, major employers have laid off or terminated thousands of workers. At the same time, an increasing number of farm families are being forced to find supplemental off-farm employment or to leave the farm and seek new careers. Rising living costs are forcing homemakers and retirees to seek part-time or full-time employment.

Many of these people do not know how to prepare for a successful job search. The Cooperative Extension Service is in a unique position to provide them with decisionmaking training and job search support.

Exploring Options

Looking at career options is difficult for farm families, since most have spent their entire life on the farm. They have never had a job interview or evaluated their skills and abilities.

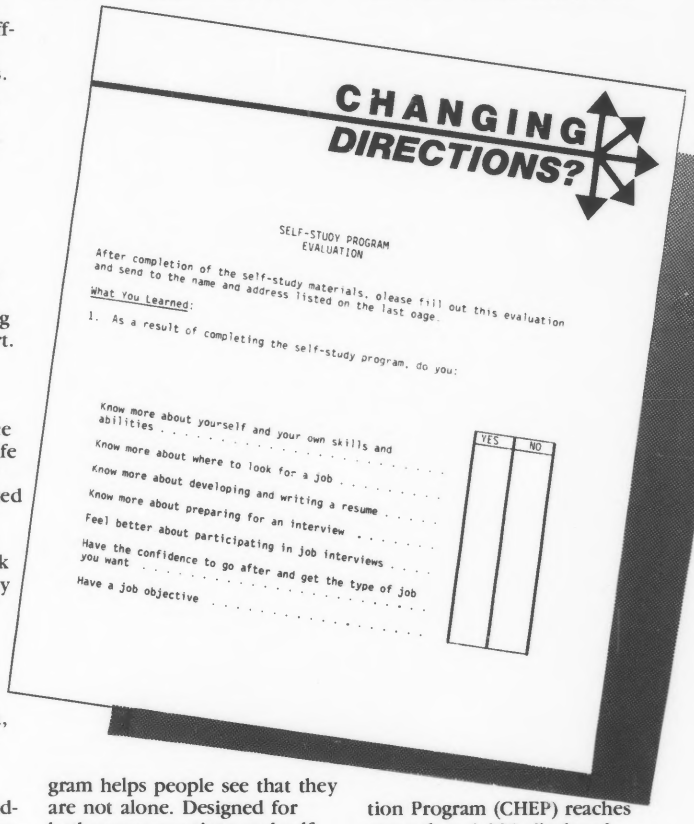
"Our job is to help them think it through and realize that they have many marketable skills," says James Morrison, Lee County Extension advisor.

Farmers have strong skills in time management, supervision, handling many tasks at once, problemsolving, financial management, working with public officials, and understanding their environment. They are self-starters, ambitious, and detail-oriented, and they take great pride in their work.

Changing Directions

As part of their "Changing Directions ... The Choice Is Yours" Program, Illinois Extension specialists Marjorie Sohn and Jane Scherer included a series of activities and worksheets to help farmers recognize their unique traits and talents.

With the help of a 19-minute videotape-which profiles five Illinois farm families, the program helps people see that they are not alone. Designed for both group meetings and self-study, the videotape discusses how people began new careers, returned to school, compiled a resume, established an onfarm retail business, determined the costs of a job, and conducted a successful job search.


CHANGING DIRECTIONS?

SELF-STUDY PROGRAM
EVALUATION

After completion of the self-study materials, olease fill out this evaluation and send to the name and address listed on the last oage.

What You Learned:

1. As a result of completing the self-study program, do you:

	YES	NO
Know more about yourself and your own skills and abilities		
Know more about where to look for a job		
Know more about developing and writing a resume		
Know more about preparing for an interview		
Feel better about participating in job interviews		
Have the confidence to go after and get the type of job you want		
Have a job objective		

Other program components include sample resumes, interview questions, local resource directories, and evaluation instruments. When the best option is to go back to school for retraining, the program helps farm families make the necessary connections.

Low-Income Clientele

Each month, the Illinois Consumer and Homemaking Education Program (CHEP) reaches more than 1,000 displaced homemakers who are on public aid. The employment aspect of CHEP prepares participants for the job market by improving their job search skills; helping them to develop marketable skills or to see how their exist-

ing skills could be transferred to paid employment; and building their self-confidence about finding, getting, and keeping a job.

State specialists have trained 35 CHEP paraprofessionals to help clients assess their skills and locate jobs, and they have developed employment-related teaching materials for this audience. In the past year, the program reached 125 low-income clients with education about preparing for the job market.

Changing Lives

All of the 26 participants who were surveyed about their continued education reported that they had returned to school as a result of the CHEP lessons. More than one-fourth of the group said that their educational advancement had led them to a job.

Of the 48 homemakers who were questioned about the results of their participation in CHEP employment lessons, 54 percent have been placed in a job—a high placement rate, considering the extremely high percentage of unemployment in the CHEP target communities.

When asked how their lives changed after they found a job, homemakers listed several positive results, including more self-confidence, more income, less illness, and fewer family arguments.

Success Stories

The CHEP program can cite many notable achievements. For example, a 19-year-old resident of a drug and alcohol rehabilitation center had job skills, but no idea of how to market them.

"When he had jobs in the past, he had trouble keeping them," says Sarah Pashia, CHEP community worker. "I taught him how to write a resume, conduct a job search, and prepare for an interview. After five lessons, he was very confident. He got a new job as a mechanic and is happy to be back in the workforce." ▲

Farmer's Market Line—Connection To Quality

Bruce M. Barbour
Senior County Agent,
Rutgers Cooperative Extension,
Sussex County
Newton, New Jersey

Because of high land values, taxes, and scarcity of affordable labor, New Jersey growers must work as hard as any in the Nation to stay competitive.

The Farmer's Market Line, the newest project of Rutgers Cooperative Extension, is aimed at increasing the efficiency of wholesale and retail marketing in the state.

The market line is a computer-based information exchange service designed to bring together buyers and sellers of agricultural commodities. The pilot project, initiated and coordinated by Bruce Barbour and John Dumschat, Sussex County agricultural agents, is opening new markets for the growers involved. Eleven counties in the state are participating in the project which is conducted in cooperation with the Sussex County Economic Development Commission, the New Jersey Department of Agriculture, and several county boards of agriculture throughout the state.

A telephone and a personal computer are used to keep a running inventory of agricultural products available on farms in the marketing region. Growers submit their information over a special phone line which has a message recorder operating 24 hours a day, 7 days a week.

Buyers who inquire about farm products receive a printed list of farms that records show have the desired commodity on hand. Buyers receive a response within 12 hours of receipt of any call, Monday through Friday. To date there have been 470 registered users and 2,500 phonecalls. There is no charge for the use of the market line.

Some examples of "farm products" that are sold through the market line are fruit, vegetables, livestock, flowers, hay, firewood, sod, and nursery stock. There is a listing for farm machinery. All agreements are negotiated directly between the buyer and the seller.

In October 1987, Rutgers Cooperative Extension instituted an online computer bulletin board version of the Farmer's Market Line. Rutgers Extension factsheets on various agricultural subjects are also posted on the computer bulletin board.

Career Assistance For Farmers

Thomas W. Ilvento and Paul D. Warner Extension Community Development Specialists, Community Affairs University of Kentucky, Lexington

Dewey Crawford, Toyota personnel director, discusses procedures for employment at his company with farmers and their families. Career Assistance For Farmers (CAFF), a University of Kentucky pilot project, targets employability skills training for farmers in the off-farm job market.

Most farmers have a strong desire to continue farming, but insufficient profits or burdensome debt have caused many to reevaluate their status. Although some will be able to "weather the storm" by modifying their farming practices, others will find that farming is no longer a viable option.

Career Assistance For Farmers (CAFF) is a University of Kentucky pilot project designed to provide guidance to farmers, farm family members, and farm workers who must shift to off-farm employment.

Overcoming Disadvantages
Farmers are at a disadvantage in the off-farm job market for two reasons: 1. Many farmers have had limited off-farm work experience, so they may not understand the process for obtaining a job; and 2. many employers do not understand how farm-related skills can be applied in the off-farm sector.

The primary component of the Career Assistance For Farmers program is employability skills training. A series of six training modules guide clients (either singly or in groups) through the entire job search process. The modules cover: skill identification, job search strategy, writing a resume, the job application, the interview, and accepting and starting the job.

Pilot Project
A 16-county region in central Kentucky where a major manufacturer had announced plans to locate was the site for the 1-year CAFF pilot project, which began in July 1986. Major funding came from Title II-A of the Federal Job Training and Partnership Act (JTPA) for the economically disadvantaged. Extension at the University of Kentucky made in-kind donations of staff time and services.

Each of the three career assistance specialists who were hired to implement CAFF was responsible for a five- or six-county area; two Extension specialists were project leaders. The main focus of the program was a series of seminars presented in each county.

The career assistance specialists developed extensive contacts with local civic and business leaders, both to educate them about the problem and to allow them to make suggestions for the seminar programs.

Program Results
More than 60 farm families took advantage of the training seminars, and another 25 people asked for Extension's assistance with specific job-search problems. The career assistance specialists contacted representatives of more than 120 businesses and spoke about the program to more than 1,250 professionals and lay leaders throughout the state and at national conferences.

About 80 percent of the program participants were men. They represented a wide range of farm situations, from those still engaged in farming to several who had recently participated in the dairy buyout. Most either owned or worked on family farm operations.

A Positive Approach
The seminars stressed to farmers the idea of "selling themselves" to employers and the importance of a positive attitude and persistence.

By talking to employers, the specialists discovered that many do not understand what skills farmers have or what jobs they are capable of doing.

Dispelling Misconceptions
The seminars revealed that many farmers have misconceptions about various aspects of off-farm employment, such as what employers look for when hiring, pay scales, benefits, and employer expectations. Many had unrealistically high wage and benefit expectations, for example, and some older farmers were unnecessarily pessimistic about their ability to compete with younger job applicants.

Speakers from local companies were helpful in discussing many of these sensitive issues and in giving farmers a better perspective on the job market. By the end of the seminars, many farmers were much more optimistic about their chances of finding employment and were actively writing resumes and applying for jobs.

Followup
A followup survey revealed that more than half of the seminar participants had completed a resume and 78 percent had submitted a job application; however, only 45 percent had been interviewed for a job. None had enrolled in training programs, despite the fact that many had expressed interest in career training. Seven percent had begun working on a high school equivalency degree.

Fifty-six percent of the participants who were unemployed at the time of the seminars and who were actively looking for work were employed by the time of the survey, most in full-time positions.

Many others were optimistic about obtaining employment at the new manufacturing plant scheduled to begin operation in the area soon. A few people were continuing to farm.

Publication Availability
The CAFF staff is revising the training modules into a teacher's manual format. The manual will be published by the Southern Rural Development Center at Mississippi State University and made available for use by other states. ▲

Community Economic Development Workshops

Charles Gratto and Daniel Otto
Extension Economists, Department of Economics
Iowa State University, Ames

Monona, Oskaloosa, and Northwood are three of the 60 communities which have participated in Iowa's Community Economic Development workshops. Their local leaders are unanimous about the benefits to their communities after their participation.

Since the workshops, the economic development group in Monona, located in northeast Iowa (population 1,530), has acquired new businesses, is advertising the community to prospective businesses, erected a new sign welcoming visitors, reviewed other communities' development programs, participates in programs of the Iowa Department of Economic Development, and produced a videotape to promote the community.

"The workshop helped create community awareness about what the development group was doing," says Monona banker Jim Burger. "It helped create positive feelings in the community."

Following the workshop in Oskaloosa, located in southeast Iowa (population 10,989), that community opened a new shopping center, garnered two new industries, achieved dramatic improvement in attitude and community self-image, started community image activities (litter control, cleanup, flowers), and initiated a Main Street renewal.

"We've really tackled the community problems with some positive results," comments Warren Fye, Oskaloosa Chamber of Commerce executive.

In Northwood, Iowa (population 2,193), Mayor Eine Lunde reports the community has erected a building to recruit business prospects, received state grants to recruit industry and help a local cabinetry firm expand, and created a seed capital firm that has raised more than $30,000 in investment capital to help local businesses.

Workshop Requirements
Before a workshop is scheduled, three conditions must be met: All participants must agree to commit an entire day to the workshop; the community must have a strong local sponsor to convene the workshop and to provide a core of leadership for followup activities; and participants must pay a modest fee (usually around $12) to defray a small part of the workshop costs.

Who Participates?
The 12 to 20 local participants generally include: (1) members of the board of the local development corporation; (2) representatives from the Chamber of Commerce; (3) local government officials; (4) officers of local financial institutions; and (5) others who can make some special contribution to the process.

Iowa State University participants include Charles Gratto and Daniel Otto, Extension economists; Stuart Huntington, planning and development specialist; the area community resource development specialist; and the county Extension director. State, area, and local Extension staff members all have important roles in the workshops.

A Typical Workshop
All of the workshops contain many of the same elements:

- An opportunity for university participants to tour the community, meet with local and area Extension staff, and talk with community leaders.

- A discussion of standard economic development strategies and the need for balance among strategies.

- Completion of a 23-question "community self-assessment" audit concerning actions communities can take to enhance growth prospects.

- Presentation of data on the local, Iowa, and U.S. economies and how they interact to affect the economic situation of the community.

- Creation of a ranked list of actions the community can take to enhance prospects for economic growth. The list is limited to actions which are within the power of the community and which can be completed within about 6 months.

- Dividing into work groups, each of which prepares a detailed plan on how to accomplish two or three of the projects from the priority list. Group members decide what will be done, when it will be done, and who will do it.

- Sharing plans among groups so efforts can be coordinated.

- Choosing a time to meet again to hear progress reports. Sometimes the sponsoring group sets up future meetings; sometimes the workshop participants create a new organization to take charge. In either case, Extension remains ready to support the work.

A Versatile Model
The format for these Iowa Community Economic Development workshops was adapted from Wisconsin's successful experience. Because the workshop model is applicable in a variety of situations, other State Extension Services may find it as useful a community development tool as Iowa has. ▲

Rusty Bucket Strategies In Missouri

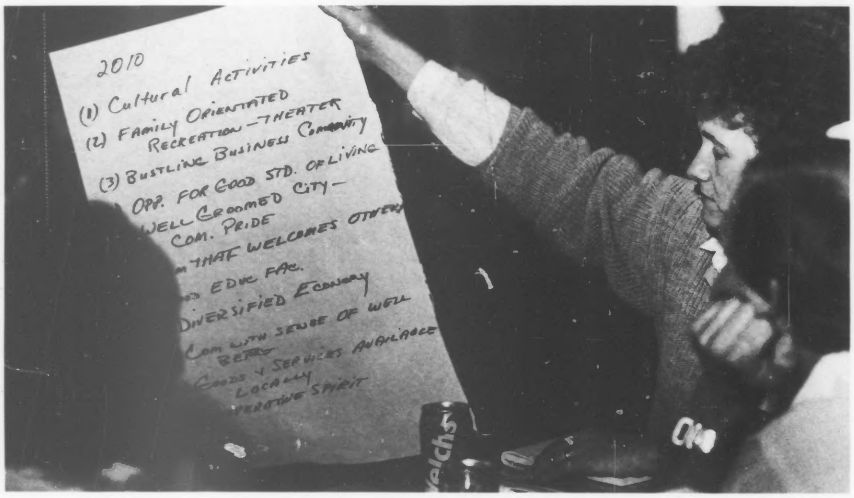
Mary Simon Leuci
Clearinghouse and Tool Kit Manager, and
Jerry L. Wade
Extension Community Development Specialist and
Workshop Director, Missouri Community Economic Development Projects
University of Missouri, Columbia

Many Missouri community groups are discovering that community economic development depends on them. Through Rusty Bucket Workshops and a *Tool Kit For Alternative Economic Development*, they are seeing their community, its resources, and its options in a new light. The "can-do" emphasis of this Extension economic development program helps communities build on their current capacities.

Jerry Wade and Mary Simon Leuci, both members of Extension's community development staff, University of Missouri, Columbia, originated the program. They use a rusty bucket to illustrate how money flows and leaks through a local economy. Next they help the community identify local economic development strategies that the rusty bucket analogy suggests to plug the leaks and bring jobs back home, regardless of the community's size. These strategies are the basis for identifying potential alternative economic activities that will diversify and stabilize the local economic base.

Methodology for Development

Wade says that his "rusty bucket" workshop evolved along with the Clearinghouse for Community Economic Development and the *Tool Kit for Alternative Economic Development*, both of which are managed by Leuci. Together, they present a methodology for community economic development and a supportive set of multimedia educational materials.



resources and capacities and develop ideas for using these to rebuild the community.

Import substitution, value addition, and resource enhancement are three internal economic development strategies that the rusty bucket analogy suggests to plug the leaks and bring jobs back home, regardless of the community's size. These strategies are the basis for identifying potential alternative economic activities that will diversify and stabilize the local economic base.

The Tool Kit, designed and developed by Wade, Leuci, and Carolyn Cook, provides the means for others to replicate the Rusty Bucket Workshop. It also contains supplementary materials for followup to the workshop and resources for studying, developing, and successfully pursuing these activities.

During the past 2-1/2 years, Wade and Leuci have demonstrated the effectiveness of the rusty bucket strategies in over 25 workshops. These have been hosted by community groups in Missouri, Iowa, and South Dakota and presented at regional and national meetings of agriculturalists, community developers, and energy officials.

Their work has resulted in international inquiries and the purchase and use of Tool Kits by groups in 20 other states. Several states—Texas and Georgia, in particular—have made extensive use of the Tool Kit in their economic development programming.

Making A Difference

The workshops and use of the Tool Kit have made a difference in Missouri in both dramatic and subtle ways. As a result of a workshop conducted in Stone County, Wade and Leuci were asked to present the workshop to the Missouri Legislative Conference on Rural Economic Development in August 1987. The 30 legislators who participated left the conference excited about the possibilities for revitalization of their home communities.

The rusty bucket strategies appeal to groups for several reasons. The program's commonsense approach encourages people to dig right into participatory sessions. They come away with hope for the future of their community—whether its population is 100 or 500,000—and with a mechanism for generating ideas to bring about this future.

For example, people in Pettis County, Missouri, are exploring the importance of growing more vegetables and fruits locally instead of importing them from California. The community of Mexico, Missouri, is studying the feasibility of generating power and new jobs from its wastes. And a locker plant in Hamilton, Missouri, is butchering and selling locally grown beef to the school system.

Cooperation for Renewal
As the concepts of economic development have fermented within communities, new community organizations have sprouted, and existing organizations have assumed more responsibility.

The Tool Kit, like the workshops, has given people hands-on opportunities in community economic development. What are the "tools" which provide these opportunities? A videotape replicates part of Wade's workshop presentation and introduces the underlying principles and strategies of internal development. Through a semiannual bulletin, communities and organizations can share ideas for community development activities.

A computerized *Catalog Of Ideas*, updated semiannually, contains case examples and resources. The case examples illustrate successful alternative economic activities from around the country. The resource database lists organizations, publications, audiovisuals, software, and conferences.

Alternatives For The 80's
The foundation for the rusty bucket methodology of community economic development rests in the experience of Extension Community Development Specialists Jerry Wade and Jack McCall in Missouri communities.
Their work underpinned the Alternatives for the 80's project begun in 1985 in response to Missouri's declining rural economy.

That project, cooperatively supported by the university of Missouri, university Extension, and Lincoln University, provided seed money for innovative projects that would strengthen Missouri communities' economies through application of Wade's internal strategies.

Since July 1986, the Tool Kit has been available in Missouri's county University Extension offices. The Clearinghouse has collected numerous community economic development materials, developed a community economic development bibliography, and functions as a referral/information source for persons throughout the country.

For more information about the workshop or the *Tool Kit For Alternative Economic Development*, contact:

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Extension specialists at the University of Missouri, Columbia, initiated the Rusty Bucket Workshops to help communities develop by using internal economic development strategies. Opposite: Participants list their projected community goals at a workshop in Maryville. Top: Participant at Maryville workshop jots down ideas in a futuring exercise. Below left: Jerry Wade, Extension community development specialist and workshop director, who developed the program with Mary Simon Leuci, Extension community development specialist and clearingbouse manager, both of the University of Missouri, Columbia, instructs on business economic development at the Maryville workshop. Right: Maryville workshop participants discuss resource enbancement, one of the internal economic development strategies.

Watchword For Rural America

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and
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Economic development has become the "watchword" for rural America as local leaders struggle to revitalize their communities. Their goal is to maintain and enhance the quality of rural life by diversifying the economy and creating additional jobs and income.

To be effective, rural leaders need to understand and have an impact on the many national and state issues that are critical to both rural and urban development. They also need to know what policies and strategies are possible at the local level.

Workshop Series
The Oklahoma Cooperative Extension Service has created a community economic development workshop series to help local decisionmakers plan and implement development strategies. The purpose of this pilot program is to explore tools and techniques used in strategic planning for economic development. Specifically, its objectives are to (1) present and discuss alternative economic development strategies; (2) identify external forces as well as local forces at work in the local economy; and (3) initiate a specific strategy for economic development activities to be conducted at the community level.

After determining that the community is interested in such a program, Extension organizes a planning team (local leaders and teaching team) to build an agenda and curriculum tailored for the community.

A Team Effort
The teaching is a team effort involving Extension professionals and representatives of planning districts, the U.S. Small Business Administration, State Department of Commerce, and other state and U.S. regional agencies. The team approach ensures that all avenues for assistance will be explored and also reduces community confusion about sources of help.

Extension involvement has included county agents, state and area rural development specialists, home economists (home-based business), and agricultural economists (marketing and agricultural diversification).

Since each topic is taught by a different member of the teaching team, the workshops provide the community with a wide exposure to economic development alternatives and techniques from many points of view.

Overview
The audience for the overview session is the local community economic development team—usually 15 to 25 people including business owners, chamber of commerce members, industrial trust members, local government officials and employees, and other local leaders.

The overview session previews the subsequent workshop series, which normally consists of nine weekly 2-hour evening meetings. Some communities have chosen to have the workshops presented in four sessions instead of nine; others have covered all the material during a 2-day "retreat."

Workshop Topics
Topics include: basic economic data and analysis; economic development strategy; home-grown business and industry; attracting new business and industry; community team development; financing economic development; and community impact analysis. Several of the topics include "working" sessions with community team involvement, and the final session explores the community's commitment to work. The result is intended to be a "blueprint for action" produced by the community.

Extension or the planning district provides participants with a notebook containing supplemental material on each topic as well as a report of the strategy which the community developed during the series. The intent is to provide tools and techniques to allow local leaders to follow up with viable economic development efforts on their own. The agencies and groups represented on the teaching team are available for followup assistance as well.

Effort Will Continue
Over the past year, about 15 communities, groups of communities, or organizations have participated in the training. The response has been enthusiastic, and evaluations have been positive. Some communities have attracted new industries, formed development committees, or accomplished some other goal contained in their strategy.

Ten to fifteen more communities have expressed an interest in the training, and the Oklahoma Association of Rural Electric Cooperatives plans to work with Extension to train people in rural areas.

The challenge and opportunity are there—Cooperative Extension has an important role to play in economic development. ▲

TCAP—Successful Texas Tool

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Texas Agricultural Extension Service
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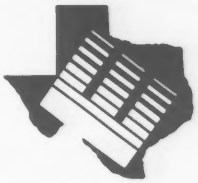
Texas



For community development to be effective, citizens must first take a hard look at existing conditions and then determine the priorities for improvement. The Texas Agricultural Extension Service has devised a needs assessment and planning program to help communities look at long-range planning in a new way.

Texas Cities Analysis and Planning (TCAP) is a self-analysis, planning, and development program for nonmetropolitan towns and cities—usually those with a population of less than 20,000. It encourages broad-based involvement of elected and appointed municipal officials, city employees, leaders, and citizens.

Profile And Survey

TCAP includes two major components: (1) a profile of 20 community facilities, services, and functions and (2) an opinion survey.

The community profile evaluates the adequacy and quality of community facilities, services, and functions. It is developed from information provided by city administrative staff and others who are knowledgeable about particular facilities and services.

The major categories in the profile are: arts and cultural enrichment; retail business management; city codes and ordinances; community appearance; communications; fire protection; fuels and power; health and sanitation; housing; industrial development; municipal administration and planning; parks and recreation; police protection; schools; streets; tourism development; transportation; water; waste water; and solid waste management.

Collectively, these factors provide a comprehensive profile of the community which governing bodies can use to determine current status and to plan for improvements. The profile is also an excellent tool for attracting industry and encouraging economic development.

The community opinion survey allows citizens to express their views about community services. Residents selected in a random sample answer 60 questions about the community leadership and the ability of the leaders to plan and implement programs.

Coordinated Effort

A successful TCAP effort requires coordination among many organizations and groups. Since a major portion of the community analysis relates to municipal services and facilities, Extension does not recommend that a community undertake a TCAP program without official city council approval.

The city government must provide the leadership, direction, and impetus, but they need solid support from such groups as the chamber of commerce, industrial foundations, schools, financial institutions, utility companies, other businesses, and the news media, as well as from individual citizens.

City administrative officials and management personnel in other cooperating organizations collect most of the data needed for TCAP. Then Extension community development specialists or other economic development professionals analyze the data and present a report to the city council and other groups responsible for economic development.

The report serves as a planning document which can help the city develop a comprehensive long-range plan or update an existing plan.

TCAP In Action

Over the past 3 years, several Texas communities—ranging in population from 700 to 11,000—have started TCAP programs. Not all city officials have fully utilized the findings in the reports, but several have used them as the basis for new programs to satisfy community needs.

Lindale, a northeast Texas city of 3,000, began a TCAP effort in 1986. The needs they identified included street improvements, industrial development, traffic control, park improvements, and more doctors and medical services. Using the report as a planning document, the city has made considerable progress in the following areas—

- The city annexed a 100-acre site for commercial and industrial development and has issued $850,000 in bonds for construction of waste water services. The state is upgrading traffic signals at the nearby intersection.

- Survey work has begun on a downtown water and street improvement project.

- The city council obtained a state matching grant of $188,000 (which the city can match with labor and materials) for parks and recreation projects.

Other cities with TCAP programs have had similar results. People throughout Texas are finding that TCAP provides them with a way to get involved in determining their communities' needs and to take the action necessary to correct the problems and improve the quality of life.

Opportunity Is Spelled Big South Fork!

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and
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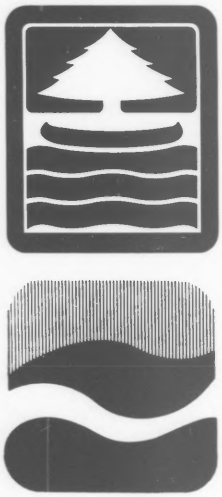
Scott County Extension Leader, Oneida, Tennessee



More than 3 million people annually are projected visitors to communities around the Big South Fork National River and Recreation Area in north-central Tennessee and southeast Kentucky.

The Big South Fork of the Cumberland River flows north from Tennessee's Cumberland Plateau into Kentucky and its junction with the main river channel in what is now Lake Cumberland. Along its course, the river has cut a spectacular 500- to 700-foot-deep gorge through the sandstone and shale of the plateau.

Development Through Tourism

Economic development was one reason why Congress authorized creation of the 123,000-acre national river and recreation area in 1974. Because the economy of this rural Appalachian region has been based on timber and coal, it has been subject to booms and busts. The region's isolation, rugged topography, and relatively small population make it difficult to base economic development on manufacturing. But the limitations for industrial development can be advantages for economic development based on tourism and outdoor recreation.

At first, people had mixed feelings about the recreation area, and they wondered how it would affect their communities. Growing numbers of local leaders came to Extension with their questions.

In response, the Tennessee Agricultural Extension Service, in cooperation with the Kentucky Extension Service, National Park Service, and Corps of Engineers, organized a workshop for local elected officials and community leaders. The meeting examined the plans for the recreation area and discussed the ways in which the visitors attracted by the project might affect local public services and facilities, private businesses, and community life. Followup sessions revealed that people needed to know more about what to expect and how best to take advantage of the opportunities of the newly designated area.

Responsibility For Development

Development related to the new recreation area had two aspects: (1) development within the boundaries of the national area, and (2) development of services, facilities, and businesses in the surrounding area. The first was the responsibility of the Corps of Engineers and National Park Service; it would be up to the communities themselves, however, to ensure the success of the second and to translate economic potential into salaries, profits, and local taxes.

The size of the national area, which includes land in seven counties and three development districts in two states, placed it beyond the authority of the existing infrastructure. The need for a regional coordinating group soon became apparent. With the help of Extension specialists, a charter and bylaws were written, and the Big South Fork Development Association began to function.

Role Of The Development Association

The association's purpose has been to help the region get ready for the national area, take advantage of the opportunities, and anticipate and address problems before they become critical obstacles. It also has provided a channel through which the two state Extension Services and other agencies can work with local groups and individuals.

Early efforts focused on local preparation, including a detailed analysis of the impacts of projected tourist numbers on the local area. The two Extension Services cooperated to conduct workshops on potential business opportunities. Interest generated by these workshops led to two hospitality training programs for restaurants and retail businesses. In addition, the Tennessee Extension Service presented a three-session workshop on marketing a tourism business.

Fostering the development of the national area itself has been a second priority. The association has been a channel for local comments on development plans, has worked for full Federal funding for the project, and has been the local sponsor for groundbreaking and dedication ceremonies for every major feature within the national area.

Promotion Is Important

Promotion has emerged as a third priority and will become increasingly important as development of the national area nears completion. With the help of a Tennessee Extension Service slide program, "Company's Comin'," association members have made presentations to many local groups, informing them of the opportunities and potential benefits of the national area. A visitor's guide, formatted as a tabloid newspaper, is in its fifth year.

Visitor numbers have not yet reached 1 million per year, but increases are steady. The prospect of 3 million visitors annually does not seem as impossible as it did in 1977. Whatever the ultimate number of visitors, however, the region will be better prepared to benefit, thanks to the efforts of the development association and Extension. ▲

Wyoming: Take Charge!

Creative leadership at the local level is essential if rural communities are to overcome persistent and critical problems relating to economic vitality, social services, population trends, and general deterioration in the quality of life.

Community leaders must identify local problems and then develop and implement community improvement programs to address them. But successful development programs don't just "happen." They require planning, organizing, and—perhaps most important—cooperation among all facets of the community.

Several Wyoming communities are pursuing economic development through a program entitled "Wyoming Take Charge." Take Charge is an organized "grassroots" effort to apply the skills and talents of local residents to programs for improving their communities. The Wyoming Cooperative Extension Service provides training and technical assistance for the Take Charge program.

Prototype Council
In 1986, Greybull rancher Stan Flitner worked with Extension to organize the Greybull-Basin Take Charge Council in 1986. The council is a broad-based group composed of local business owners, representatives of civic organizations, local government officials, and interested citizens. It now serves as a prototype for councils in other Wyoming communities.

The Greybull-Basin area has been particularly hard hit by recent declines in the mineral and energy industry. In May 1987, the county's 16-percent unemployment rate was the highest in Wyoming. To address local residents' concern about the economic future of the area, the Take Charge Council has focused on developing strategies for revitalizing the local economy.

Stopping Dollar Leakages
One important strategy has been to increase the community's ability to capture local retail purchases—to keep local money from being spent at larger trade centers instead of at home.

These lost dollars, called leakages, represent a loss of jobs and income to local citizens. The Greybull-Basin Council's project for reducing retail leakage involves estimating the area's retail market potential, determining what factors influence the community's ability to capture retail dollars, and then implementing programs to retain more of these dollars.

Computer software developed at the University of Wisconsin by Glen Pulver and Ron Shaffer helped in estimating the potential retail market. The analysis showed an annual potential of $66 million, only 60 percent of which is being captured by the local economy. This $27 million in lost retail sales represents a significant loss of jobs and income for local residents.

Purchasing Patterns
What influences an area's ability to capture retail dollars? With the help of volunteers, a Chamber of Commerce, and a local rural electric company, the Greybull-Basin Council surveyed local residents to determine consumer purchasing patterns and the reason for them.

Many people had reservations about the local commercial sector. Nearly one-third gave the business community a rating of poor, with the average rating slightly less than fair. The survey indicated that the commercial sector may be able to keep more dollars at home by emphasizing the conveniences and benefits of buying locally and by improving quality and providing better service. The survey also highlighted the importance of retired residents to the local retail market and showed a need to emphasize the competitiveness of local retail prices with those in neighboring communities.

Project Impacts
The Take Charge Council organized a Range Clinic to bring together federal land managers, permittees, and downtown business owners. More than 80 people attended the 2-day tour. Stan Flitner, Take Charge president, comments that the clinic tried "...to get the federal and private sector people together to show we do have some common economic development interests."

The Basin Chamber of Commerce sponsored a workshop on marketing and sales. According to Chamber President Mary Winger, "The survey pinpointed exactly what areas we (downtown businesses) need to work on. It backed up what we'd speculated about for a long time."

The area medical community was the target of many criticisms in the survey. In response, the hospital is publishing a newsletter to inform the public of services and positive activities. Tom Green, chief financial officer, points out that "The survey gave us helpful criticism, not just hearsay."

Overall, the Take Charge project has highlighted the need for communication and for reliance on local talents in order to adequately address community problems.

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and
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Networking Incubator Programs For Small Business

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A small business incubator program is a flexible method of encouraging the development of new businesses and assisting local economic development. Incubators are facilities in which a number of new and growing businesses operate under one roof with reduced rents, shared services, equipment, and equal access to a range of professional, technical, and financial resources.

There is currently some evidence that "incubator saturation" may be occurring. To prevent this saturation, Extension at Auburn University has implemented a plan for establishing a network of small business incubators in rural Alabama.

The centralized Small Business Incubator Program (SBIP) involves federal and state funding sources, the statewide system of small business development centers (located at 13 state universities and colleges), and the statewide Alabama Cooperative Extension Service. The Alabama Department of Economic and Community Affairs (ADECA) has set aside $1 million of grant monies for the acquisition or renovation of facilities to be used as incubators.

Alabama is the first state with the task of a statewide coordination effort in this area. The U.S. Small Business Administration has pledged the resources of the 13-member Small Business Development Consortium to the statewide incubator network. Alabama Extension at Auburn University will handle coordination through the central Small Business Incubator Program.

Evaluation And Criteria
In April 1986, the probability of success of incubator sites throughout the state was evaluated. Initially, 19 municipalities responded to a call for participation in the program. Five municipalities were recommended by the Small Business Incubator Program to ADECA for participation in the program's implementation stage. (For demographics of these municipalities see chart accompanying this article.)

Demographics Of Selected Small Business Incubator Sites

Town	Population	Median Family Income	High-Tech Area	University Nearby	Interstate Access	Ease Of Metro Access
A	28,000	$19,231	No	Adjacent To Major Land Grant	Adjacent	Yes
B	9,000	13,784	No	Regional: 60 miles	Adjacent	Yes
C	43,000	20,882	Yes	Regional: 20 miles	Adjacent	Yes
D	4,500	16,234	No	Regional: 50 miles	Adjacent	Yes
E	4,800	18,399	No	Major: 40 miles	No	No

Nine criteria were used to assess the success potential of the incubator sites: the municipality's ability to financially contribute to the project; the population base of the municipality; the potentially beneficial effect the incubator center might have on the local economy; the availability of local technical support to tenants of the incubator; level of interest in program participation by leaders of local government; suitability of the proposed site; level of infrastructure serving the site; cost factor of proposed site; and "program clarity"—the city's ability to commit to the program.

Strategy
The networking of the rural incubators will be a plus factor to familiar incubator advantages such as reduced rent and onsite shared services.

Technical Assistance
The central Small Business Incubator Program will concentrate onsite technical assistance in business and management to sites within a reasonable distance of Auburn University. Requests for technical assistance from other incubators will be coordinated through the SBIP but serviced by the statewide consortium of Small Business Development Centers.

Alabama Extension has acted as the hub which has permitted access to every area of the state.

Tips For Other Communities
Some points to keep in mind when creating an incubator network are—

1. Approach the task slowly and carefully. Incubator sites that are selected with care will survive.

2. Do not be swept away by the "romance" of incubator popularity. Incubators are not a "cure-all," and they are not appropriate for every town.

3. Coordinate all federal, state, and municipal thrusts. This is not an easy task, but, in the long term, such coordination will prove extremely beneficial.

4. Wherever possible, eliminate local protectionism and foster regional participation. ▲

Agribusiness Park—Economic Hope In The Florida Panhandle

Charles T. Woods
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Editorial Department,
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At a time when almost every city and county is pushing development of a high-tech industrial park, farmers in the Florida panhandle—the state's most economically depressed area—are advocating something different: the southeast's first business park for agriculture.

The Apalachee River Basin Agricultural Park—originally proposed by Calhoun County Extension Director Logan Barbee—will be located on 207 acres between Blountstown and Altha in Calhoun County. The site is expected to become an economic hub for a five-county region that is one of the Nation's poorest.

"We've got all the right stuff to make this agricultural park viable," Barbee says. "It is near a major highway, rail access, and the Apalachicola River. There's a good market for poultry and catfish and there are people who want steady employment."

One year ago, Barbee proposed the project to the Apalachee Regional Planning Council. At that time farmers who grow soybeans, peanuts, corn, and sorghum were reeling from the farm crisis.

A catfish processor has already signed a letter of intent to locate in the park, Barbee notes, and two poultry processors are interested in the park. Contacts from other poultry processors and agribusiness groups are expected.

The poultry and catfish operations would represent an estimated $20-million investment and could employ over 1,000 workers within 5 years. Total economic spinoff from these two firms could number about 3,000 jobs.

Federal Grant Request

Approval has been requested for a $2.7 million grant from the Economic Development Administration for electric, water, sewage treatment, and other infrastructure at the park.

"Senator Lawton Chiles and Rep. William Grant are very supportive of the project," Barbee explains. Once the federal grant is approved, the Calhoun County Commission will exercise its option to purchase the 207-acre park site, he adds.

The park is expected to create an impressive demand for broilers and catfish. "When these processing plants begin operations in the park," Barbee projects, "we estimate they will support 300 or more new poultry and catfish farmers in our five-county region which includes Calhoun, Gadsden, Gulf, Jackson, and Liberty counties.

"These new poultry and catfish farmers in our area will create a tremendous demand for grain, one of our traditional row crops," Barbee says. "We estimate these new farmers will need several thousand tons of grain per week. This demand, in turn, could spur development of a cooperative feedmill owned by the farmers."

Barbee attributes much of the early interest in the park to market research by Institute of Food and Agricultural Sciences (IFAS) economists and poultry specialists, coupled with a 10-minute Extension-produced videotape shown to prospective agri-business clients in the southeast.

Michael Ouart, Extension poultry specialist with IFAS in Gainesville, says the five-county area is ideally suited to broiler production and processing. Winter weather conditions are good, he comments, the market for poultry is strong, and the site is midway between existing production centers.

"Florida's annual consumption of chicken is expected to increase to 808 million pounds by 1990 and 935 million pounds by the year 2000," Ouart says. "The need for additional production capacity is there."

Prospects And Potential

David Zimet and Timothy Hewitt, Extension farm management economists at the IFAS Research and Education Centers at Quincy and Marianna, respectively, conducted a survey of 110 landowners in the five-county area. The survey indicates that 78 individuals would be willing to operate broiler houses under contract for a large regional poultry processor at the park.

"Prospects for a catfish processing plant at the park are also good," reports Michael Ednoff, aquaculture development representative, Florida Department of Agriculture and Consumer Services, Tallahassee. "This project," he says, "has success written all over it because we will not be competing head-on with catfish farmers in Mississippi."

Ednoff believes there is potential at the park for culturing, processing, and distributing other species of fish, such as sunshine bass, sturgeon, and redfish. "By producing a variety of fish products," he says, "the agribusiness park could become a one-stop source in the Florida seafood distribution chain.

"Florida Panhandle Catfish, Inc., the first processor that has agreed to locate at the park, has already set up a marketing agreement with a national seafood distributor," he continues. "The processing plant will need a continuous supply of fish and that's where over one hundred small farmers come into the picture. Of course, byproducts from catfish processing can be used in poultry feed. A unique feature of this processing operation is that they may offer catfish farmers an opportunity to become stockholders in the processing plant."

Future tenants for the Apalachee River Basin Agricultural Park may include processors of shrimp, peanuts, grain, and vegetables as well as other enterprises compatible with the agribusiness park concept. ▲

Framework For Change

James Wolfe
Writer/Editor,
Extension Service,
USDA

At the seminar on community leadership for rural limited-resource audiences—"Community Leadership—A Framework For Change"—held at North Carolina A&T State University, Greensboro, in February, Robert W. Long, Deputy Assistant Secretary, Science and Education, USDA, emphasized "the need for us to work together—to think together—to develop leadership in rural communities." Seated at the speakers' table (left to right) are: Leslie Lilly, Community Development Officer, North Carolina Rural Economic Development Center; Obie Patterson, Program Analyst, Office of Minority Research And Teaching Programs, USDA; Edward B. Fort, Chancellor, North Carolina A&T State University; and Myron D. Johnsrud, Administrator, Extension Service, USDA.

In February 1988, Extension at North Carolina A&T State University, Greensboro, launched the initial phase of a multi-state project for limited-resource audiences: "Leadership Development For Public Decisionmaking."

"The program's leadership aspects—an enhanced understanding of public issues and increased decisionmaking skills—will result in a broadened leadership base essential for economic development," says Dalton McAfee, assistant administrator of North Carolina A&T State University. In addition, McAfee believes an improved capacity to apply and utilize technology, knowledge, and information will enable communities to develop and sustain a local competitive advantage.

Funded by a $1.2 million W.K. Kellogg Foundation Grant to the university, the seminar in Greensboro on community leadership for rural limited-resource audiences—"Community Leadership—A Framework For Change"—was attended by Myron D. Johnsrud, Administrator, Extension Service, and Robert W. Long, Deputy Assistant Secretary of Agriculture for Science and Education.

North Carolina A&T State University is the lead 1890 institution for a program aimed at developing and strengthening the leadership skills of limited-resource audiences. There were approximately 100 participants in the program, including a significant number of rural residents, small-scale farmers, single parents, public-housing residents, and displaced workers.

Program Phases
The leadership program at North Carolina A&T State University is envisioned in two phases.

Phase I, planned for the first year of the project, includes the development of six training modules: situational analysis and needs assessment; leadership; communications; group process; public policy; and impacts and evaluation. (A Request For Proposal will soon be issued for module development.)

Phase II, for years two and three of the project, includes the involvement of three 1890 institutions in training limited-resource community leaders.

Maximizing Effectiveness
Senator Terry Sanford, North Carolina, in a speech delivered at the Leadership Development Seminar, emphasized that Extension has a critical role in delivering successful and innovative economic strategies to "those who are in a position to make use of them.

"We will require a new generation of local leaders," Senator Sanford said, "in those communities that need our help the most. Rural residents must have hope; we must restore their optimism. They must be able to recognize opportunities for success in their own areas, rather than automatically seeking opportunities far from home in our cities. We need to develop more new ideas and demonstrate their effectiveness, but our success or failure will depend on how these ideas are communicated."

Senator Sanford pointed out that the Multi State Leadership Program is important because "leaders will be absolutely essential to reaching so many that are currently out of reach."

By developing leaders, Senator Sanford said in conclusion, "we can get people more involved in making the decisions that affect their communities. And this is the best way to attack a problem—by helping people to help themselves and their communities."

Fiscal Impact Software— New Strategies For Decisionmakers

Thomas G. Johnson
Extension Specialist, Community Resource Development, and
Associate Professor, Department of Agricultural Economics
Virginia Tech, Blacksburg

Local governments—beset by declining tax bases and prospects for economic development—are finding fiscal decisions more complicated. This is occurring at a time when they are being increasingly relied upon to take the initiative in economic development activities.

Leaders of local government are aware of their need for more accurate and comprehensive information on which to make decisions involving economic development. They need information on such diverse issues as the following: advisability of investments in industrial sites and other infrastructure, benefits and costs of different methods of providing public services, relative advantages of one development strategy versus another, preferential property taxation, and protection of agricultural land.

VIP Software Models

Virginia Tech Extension specialists and researchers have developed a series of computer software fiscal models to provide local government leaders with the framework they need to improve and expedite their decisionmaking on these issues and others.

The software models—called the Virginia Impact Projection (VIP) models—are based on analyses of fiscal experiences gleaned from Virginia's cities, counties, and towns. Research for the models was originally conducted to provide Rockingham County with a financial strategy to overcome the loss of a substantial portion of its tax base to annexation proceedings.

To create the model, researchers identify and estimate the relationships between public service expenditures, commuting patterns, and various socioeconomic factors. Then these "estimated" relationships are used to construct a microcomputer simulation model. When the simulation model is fed the specific data for a given community, it simulates the impacts of various changes on the economy of that community. The models measure changes in employment, population, commuting, local expenditures, revenues, quality of life, and economic development policy.

Programs For Local Governments

Extension has developed an economic development program around this software designed to meet the specific needs and capabilities of local governments. Local governments that have the personnel and hardware necessary to set up, run, and interpret the economic development simulations are trained in the use of the model, then assisted in developing the specific model for their jurisdiction.

Extension staff run and interpret economic development simulations for other—usually smaller—communities. In some cases, specialists use the models to explore the feasibility of economic development goals before specific alternatives are even considered.

VIP models have been developed for approximately 40 Virginia cities and counties. The models have been used for a variety of purposes including analyses of annexations, jurisdictional mergers, new and existing industries, residential developments, location of industrial sites, and general development strategies. Several communities have used the models for goal planning—estimating the conditions necessary to bring about a desired set of terminal conditions. The Economic Development Office in Richmond uses the model regularly in conjunction with its other tools to compare alternative development strategies, and development and redevelopment projects.

Training of local planning personnel in the use and interpretation of the models is not always advisable. The use of the models, particularly the development of reasonable scenarios, is not always clear to the uninitiated. However, some involvement by local experts is necessary since their insights into the local goals, resources, and restraints always lead to more realistic scenarios and interpretation. The process has led to significant improvements in the computer model and the Extension program.

VIP—Aid To Teaching

The VIP modeling project has facilitated teaching, research, and Extension. The VIP model is ideal for teaching both formal students, and local planners and officials. Since the models are on spreadsheets they are relatively "transparent," easy to modify, and relatively simple to use.

As a Virginia Tech class project in a senior level course on rural development, student teams "adopt" a community, determine what issues the community faces, and use the VIP and other regional economic tools to analyze the issues. Local officials work closely with the study teams, attend a final presentation, if possible, and receive copies of the final report and a VIP model for their county, city, or town.

As a consequence, local officials in a number of communities have attended VIP model training symposia, and then sponsored small research projects. Some officials have hired students from the class to do impact analyses for them during the summer. Research programs in this area have benefited from increased financial support and by being subject to almost constant field testing.

These fiscal impact models only provide some of the answers and estimates of benefits and costs sought by representatives of local governments. However, the fiscal models do offer decisionmakers and their staffs invaluable information that will help them make some very tough decisions about the economic development of their communities. ▲

Thomas Johnson, (standing), Extension community resource development specialist, discusses the Virginia Impact Projection (VIP) computer software model with Randy Austin, assistant town manager, Vinton, Virginia. Virginia Tech Extension specialists and researchers developed VIP software fiscal models to provide local government leaders with accurate and comprehensive information on which to make decisions involving economic development.

Charter Fishing Boom On The Great Lakes

Carol Y. Swinebart
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Michigan Sea Grant Extension
Michigan State University,
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Opposite: A sports fishing trio just off a Great Lakes charter boat proudly display six of the day's catch that didn't get away. Center: Chinook Pier is the focal point for Grand Haven, a recent waterfront development on Lake Michigan. At right: Charter boat client excitedly swivels his fighting chair as a "bit" bends his rod. Charter fishing boats have a substantial economic impact on the cities and towns where they dock. Michigan Sea Grant Extension is assisting these coastal communities to benefit economically through waterfront development.

Photographs courtesy of Michigan Sea Grant Extension.

A recent boom in the Great Lakes charter fishing industry is helping to spur economic development in several of Michigan's coastal communities. These communities, with assistance from Michigan Sea Grant Extension agents, have recognized the value of this economic impact in their areas. They are making substantial public investments to help the rapidly expanding charter fishing fleet attract additional customers, the vast majority of whom are tourists.

A 1985 marketing study, sponsored by Extension at Michigan State University and supported by Michigan Sea Grant Extension, revealed that the state's nearly 1,000 charter fishing boats—up from 100 licensed boats in 1977—have a substantial economic impact on the cities and towns where they dock. The study showed that a quarter of a million sport fishing customers spent almost $60 million in 1985 at Michigan's coastal communities.

Charter boat customers—in addition to fees paid to charter captains—purchased food, lodging, and entertainment. Each captain has an average $28,000 invested in a boat, in addition to fishing gear and other nautical equipment.

"The additional income generated by charter boat captains places them in a much better position to talk to the local banker or city council about their needs," concludes Edward H. Mahoney, Extension specialist, park and recreation resources, Michigan State University. Mahoney believes more coastal communities should recognize the economic benefits accruing from this industry.

Development At Grand Haven

Grand Haven on Lake Michigan used both state tax increment financing and assistance from the Michigan Department of Natural Resources to construct special dockage and a fish cleaning station to accommodate 16 charterboats.

Charles Pistis, Michigan Sea Grant district agent in southwest Michigan, provided information to Grand Haven officials about the state's tax increment financing arrangement which assisted them in obtaining funding for their public facilities.

These $400,000 charter facilities are one segment of a 2-mile waterfront development that runs along the Grand River to its mouth at Lake Michigan. The complex features shops, restaurants, and an entertainment center as well as a boardwalk, Coast Guard and Corps of Engineer vessels, and a paddlewheel sightseeing boat. Several million dollars have come from the private sector in response to the public incentive to rehabilitate historic warehouses along the river and develop new condominiums and office facilities.

Several coastal communities, aided by Michigan Sea Grant Extension agents, wish to emulate the Grand Haven achievement. The communities of Frankfort, Manistee, Pentwater, and St. Joseph on Lake Michigan and Rogers City on Lake Huron

have heeded the requests of charter boat captains for increased access to their communities. Steve Stewart, Michigan Sea Grant district agent in southeast Michigan, developed a computer spreadsheet model to help communities assess the potential impact of charter development and expansion. In addition, he provided capitalization rate analysis models to captains to guide them in their investment and pricing of services.

Regional Workshops

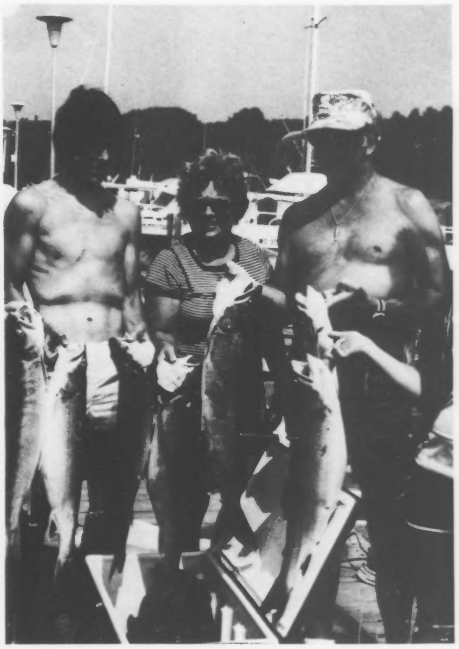
For the past 4 years, Michigan Sea Grant Extension agents have conducted regional workshops for charter boat captains to provide them with an opportunity to discuss various aspects of their economic situation, individually and collectively, with university specialists and other resource people.

Commenting on the effectiveness of the workshops, Charter Captain James Collins of Pentwater says: "We've been able to show the business leaders and others in this community that they have been missing out in such areas as marina and slip development. Recently, the community has responded to this need and we have increased local fishing facilities. We attribute this entirely to the Michigan Sea Grant Extension regional workshops."

Exploring Potential

Sea Grant Extension realizes the coastal communities have differing potential for accommodating the needs of charter captains and that the health of the fishery in general will have a strong influence on its success. However, the agents are committed to helping both captains and communities assess their prospects for mutually satisfying economic development.

Community leaders appreciate the educational and technical assistance provided by Sea Grant agents. Larry Dietjen of Grand Haven recalls the many hours Agent Pistis devoted to helping develop the plans that have resulted in a boost in tourism and millions of dollars in additional income. "He was with us every step of the way," Dietjen says, "and it made a big difference." ▲



Michigan Sea Grant Extension is part of the outreach of the Michigan Sea Grant College Program, a cooperative effort of Michigan State University and The University of Michigan in Great Lakes research, education, and Extension. District Extension Sea Grant agents are employed by Michigan State University's Cooperative Extension Service.

Bed And Breakfast Businesses— New Industry In The Midwest

Robert D. Espeseth
Extension Recreation and Tourist Services Specialist, Coordinator, Illinois-Indiana Sea Grant Program, and
Chris M. Scherer
Extension Communications Specialist, University of Illinois, Urbana-Champaign

A small rural community of less than 1,000 people in the heart of central Illinois corn country is not a likely place for a thriving "motel" business. Nor would travelers traditionally expect to enjoy home hospitality in a large, square brick home in a small southeast Illinois community or a high-rise apartment along Lake Michigan in Chicago.

However, as a result of an economic development program led by Extension at the University of Illinois, bed and breakfast businesses in settings such as these are springing up throughout Illinois, Indiana, and Wisconsin. Similar developments can be found in other midwestern states.

Each Is Unique
Each business is unique. After Thelma's husband died, for example, her five-bedroom house in West Salem, Illinois, was too large for her alone, so she decided to take in guests. Thelma's "B&B" has four rooms and she serves breakfast on a screened porch or in her dining room.

Max and Caroline bought a house that is more than 100 years old. As a part of the historical revitalization of Oakland, Illinois, they turned it into the "Inn On The Square."

In contrast to these two settings, more than 100 B&B rooms are currently available in Chicago each night.

Answer To A Problem
The B&B idea was born when it appeared that Chicago might be the site of a World's Fair in 1990. A group of people in northern Indiana thought that one answer to the expected housing problem might be to provide rooms in private homes.

James Peterson, then co-coordinator of the Illinois-Indiana Sea Grant Program, and Robert Espeseth, who was both a Sea Grant co-coordinator and Extension recreation resource specialist, put their heads together to design a series of Bed and Breakfast workshops. They pulled together a group of experts, including Extension specialists, who could help people plan and make decisions about starting their own business.

Robert Buchanan, Extension specialist in restaurant, hotel, and institutional management at Purdue University, offered his expertise. Linda Brand, small business advocacy specialist from the Illinois Department of Commerce and Community Affairs, made the resources of her office available. Sue Sadowski, from the University of Wisconsin Recreation Resource Center, offered to discuss marketing tips.

Jane Scherer, coordinator of the University of Illinois Consumer and Homemaking Education Program, provided material and led discussions on operating a home business. Others who offered program topics included representatives of local tourism councils and area chambers of commerce, county Extension agents, and operators of existing bed and breakfast businesses.

Workshops And Decisions
More than 500 people from 10 States have attended eight workshops in Illinois, Indiana, and Wisconsin. Most participants report that they plan to start a B&B when they find the right location or obtain the needed financing, or when state regulations are better established.

No studies have provided sufficient data to determine how much economic impact a single B&B or group of B&B's might have on a community. Although B&B's may not be a source of a major financial boom, however, the service they provide can be of important benefit to a community.

Individuality Is The Key
In a time of uniformity in franchise hotel and motel chains, uniqueness is the attraction that draws people to B&B's.

The bed and breakfast concept, which has spread from Europe to the United States since the 1960s, is reminiscent of the "tourist home" of the 1920s and 1930s. Unlike the early tourist homes, however, B&B's provide a breakfast and occasionally offer other meals and snacks.

Impact of Workshops
Workshop results have been numerous. Several states, including Illinois and Michigan, are setting up statewide B&B associations. In some cases, local and area associations have been formed as well.

Other activities resulting from the Extension workshops in the Midwest have included the printing of statewide B&B directories, the establishment of a news documentation center, and the creation of lobbying groups to assist with zoning and other legislative matters.

A North Central Region Publication titled "Developing A Bed And Breakfast Business Plan" is currently in production and should be available during 1988. ▲

Action Plan For Plattsburg

Charles St. Clair
Extension Community Development Specialist,
University of Missouri and Lincoln University
University Extension Center
St. Joseph, Missouri

A curious sight greeted travelers entering Plattsburg, Missouri, last summer—it seemed that every other house along the highway had a ladder leaning against it. Painting, renovating, and restoring have indeed become major activities for homeowners in this northwest Missouri town of just over 2,000 people.

Business owners hope that renovation will spread to the downtown, where empty buildings wait to be fixed up. Seeing those empty buildings repaired and filled with businesses is also a priority of the Plattsburg Chamber of Commerce's ambitious economic development action plan.

Channeling Energy
In 1983, Plattsburg marked its sesquicentennial with a huge birthday party. The Chamber of Commerce officers, impressed with the energy of the people during the celebration, wanted to put that energy to use in addressing the community's economic problems. Unsure of how to put their ideas into a logical framework, they turned to the local Extension office for help.

That initial request put Plattsburg officials in contact with Extension community development specialists at the University of Missouri, who agreed to work with the town to explore the possibilities for economic development.

Goals For 2000
At the first community meeting, Extension specialists helped the participants identify characteristics they wanted the town to have in the year 2000. Among the most significant were: a diversified economy; a community filled with young children; an appealing shopping area; well-preserved older homes; and a community prospering by using its own resources.

"In a small town, you can get a fairly good consensus pretty quickly," says Rev. Bob Dees, president of the Chamber of Commerce, "but making it happen is the tough part."

Getting The Facts
In Plattsburg's case, the assumption was that a good part of its economy was based upon agriculture and that recent business closings were a direct result of the agricultural recession. However, an analysis of the community's economic base, using a computer model developed at the university, indicated that a significant portion of the town's income comes from transfer payments to those over 65 years of age and from the salaries of professionals who commute to work in Kansas City, 30 miles to the south.

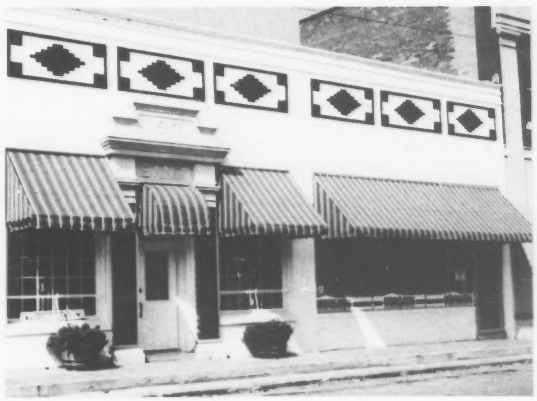
Other studies revealed that Plattsburg was having a significant increase in the number of residents between the ages of 35 and 55. This meant that the community had a potentially strong market for new business growth. But the studies also showed that Plattsburg's economy had considerable "leakage," with money flowing in from a variety of sources but flowing out for a larger variety of consumer goods and services.

Adopting A Plan
A local college student, with the assistance of Extension specialists, prepared a detailed profile of the community and presented it to the Chamber's board of directors. The profile and an accompanying economic development action plan were adopted and are now guiding the activities of task forces in five areas: changing the local economic system; encouraging the retention and expansion of existing businesses; attracting outside firms; capturing outside dollars; and creating new business.

Economic Development Progress
The task force on capturing outside dollars revived a long-dormant "Chautauqua" program. The 3-day festival attracted visitors from throughout the area.

A small business "incubator" is the newest project of the Chamber of Commerce. Professional Business Services offers basic secretarial and bookkeeping services to beginning businesses. Eventually, the chamber would like to lease or purchase a building where they could offer local entrepreneurs space, a pool of shared support services, professional and managerial services, and access to or assistance in acquiring seed capital.

Twenty-eight new businesses have opened in the community since 1985, and 18 new houses have been built in the last year.



Controlling The Future
"We now recognize that we have some control over our economy, and that we can control our future," says Dees.

"The Extension specialists in community development, business and industry, and home economics helped us discover the tools and then learn to use them," Dees emphasizes. "Extension is a resource every community should learn to use."

Educating For Small Business Management

Forest M. French
Extension Business Management Specialist, Agricultural Economics And Business
and
Mary S. Bowie
Extension Computer Specialist, University of Maine, Orono

A barnyard of a dairy in Hancock County, Maine, is used for recreational sledding; other sections of this 600-acre farm are used as a golf course and camping grounds. Maine Extension is implementing an economic development education program designed to meet the needs of small business owners and entrepreneurs in the state.

Organizational changes within the Maine Cooperative Extension Service in 1985 included the formation of an economic development program area, merging functions which had previously been divided between the community resource development and agriculture staffs.

The four Extension economists assigned to work in the economic development area began by compiling state and county data on Maine businesses. The study revealed the economic significance of small businesses in Maine, showing that the state had the largest proportion of small businesses in New England.

From this study grew the Maine Extension Service's economic development mission—developing, organizing, and delivering business management educational programming to owners and potential buyers of small-scale firms (those with five or fewer employees). Educational programs were to be based on research findings concerning the needs of small business owners and entrepreneurs in Maine and on Extension's capability to address those needs.

Involving Faculty
In keeping with its traditional approach of generating programs from the "bottom up," Extension administrators surveyed Extension faculty to determine their involvement with small business development and to assess their interests, needs, and concerns.

The survey provided a way for Extension faculty throughout Maine to provide guidance and direction for overall program development. The survey objectives were:

- To determine who among the Extension faculty were interested in economic development and how they were distributed geographically.
- To determine professional development needs related to economic development.
- To identify the faculty's concerns, issues, and areas of interest concerning economic development.
- To get faculty suggestions for clientele to be served by Extension's economic development programs.

Broad Interest
The survey revealed an interest in economic development among 75 percent of the Extension faculty who responded. Field staff expressed more interest than did campus-based specialists.

Virtually all those who expressed an interest in economic development said they would need inservice training.

Because a special interest in home-based business emerged, Extension economists worked with agents and home economists on a home-based business training program.

Needs Assessment
As one of the first steps in developing its 4-year plan of work, Extension made a statewide assessment of educational needs. Almost 50 percent of the Maine people who participated in the assessment felt that the most important issue was the economy.

This overwhelming response further verified the need to develop an Extension economic development education program. The subsequent plan of work focused on providing small business management educational programs and also on developing 4-H economic and business management training.

To begin implementation of the program, Extension organized an economic development team consisting of two agents, three specialists, and one administrator. Their first step has been to conduct a study that will examine in detail the nature of small-scale entrepreneurship in Maine.

Future Prospects
Maine's new economic development program area is issue-oriented and has the commitment of Extension faculty and administration. Questions remain about the ultimate relationship of economic development to other established programs; the availability of necessary resources; Extension's credibility in the area of business management; and the effectiveness of faculty retraining.

Exploring Possibilities In Stone County

Robert J. McGill
Extension County Program Director And 4-H Youth Specialist, Stone County, Galena, Missouri
and
David H. Reisdorpb Former Extension Area Community Development Specialist, University of Missouri, Columbia

The economy of Stone County, Missouri, is diverse enough to encompass such enterprises as the dairy farm of Chris Tarter (above) and the resort of W. K. Lewis. However, most of the economy in the county provides only seasonal employment. Leaders of local governments in the county sought and received economic development advice from Extension community development specialists. Since then, Stone County's leaders have held two economic development conferences, organized a Stone County Chamber of Commerce, and are exploring various economic strategies.

Located in southwestern Missouri, Stone County features a theme park at Silver Dollar City and picturesque Table Rock Lake. Unfortunately, the tourist/retiree-based economy of the county provides only seasonal employment and low incomes. Leaders of six local governments—frustrated with the lack of economic development—organized to change this economic situation.

In October 1986, these leaders, representing the Stone County communities of Crane, Reeds Spring, Cape Fair, Lakeview, Galena, and Kimberling City, approached Extension at the University of Missouri for answers. Robert J. McGill met with the group and referred them to David Reisdorph and Jack D.Timmons, both Extension community development specialists at the university.

In a series of meetings with Extension the Stone County *ad hoc* group learned about the work of Jerry Wade, Extension community development specialist and assistant professor at the University of Missouri. Wade's model for alternative economic development focuses on how money flows through a local economy. The three strategies he recommends communities use to build their economies are import substitution, value-added production, and resource enhancement.

The *ad hoc* group built on Wade's research and experience with alternative economic development and designed an economic development conference. The purpose of the conference was to explore the economic development possibilities for Stone County, Missouri.

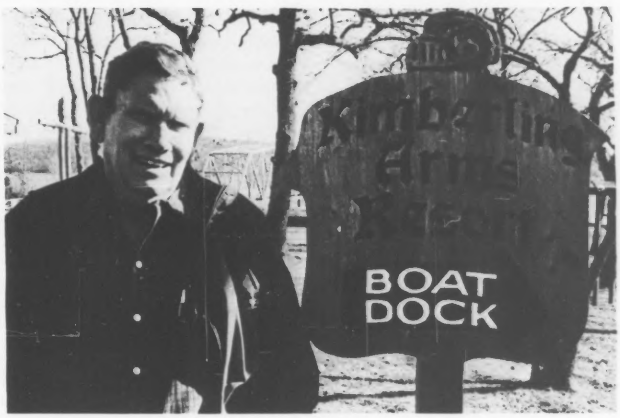
Economic Development Conference

In March 1987, the first Stone County Economic Development Conference became a reality. The conference began with a "futuring" exercise so that participants could imagine an "ideal" Stone County a decade from the present. Then Jerry Wade presented his "Rusty Bucket" model of community economic development and strategies for internal economic development. (See article *Rusty Bucket Strategies In Missouri* on page *26* of this issue.)

At the conference, there were workshops on small business, industrial, and agricultural development as well as development of recreation/tourism in the county.

In February 1988, the Stone County Chamber of Commerce sponsored the Stone County Transfusion Conference in Reeds Spring, Missouri. Three workshops were featured. Jerry Wade offered conference participants points on community economic development with a talk entitled "Community Economics" or "Keep That Money Here." Jack McCall, Extension community development specialist, Chillicothe, Missouri, lectured on "Strategies That Worked For Us." Then, Anthony DeLong of Crane, Missouri, newly elected president, Stone County Chamber of Commerce, spoke on the "Goals Of The Stone County Chamber of Commerce."

Stone County, with the help of Extension, and educational conferences which focus on establishing county goals and an understanding of the local economy, has laid a promising foundation for the future. To date, Stone Countians have avoided the "quick economic fix" while taking the time to understand strategies that will lead to successful economic development. ▲



A New Chamber Of Commerce

In May 1987, the *ad hoc* group held a second mini-conference where participants decided it was time to get formally organized. They established the Stone County Chamber of Commerce and have since incorporated and created committees to begin work. They are planning a road rally to enhance off-season tourism and have begun to explore other economic development opportunities.

Massachusetts Zeroes In On Energy Efficiency

Robert Schrader
Extension Community Resource Development Specialist, Agricultural Economics And Business
University of Massachusetts, Amherst

Home buyers consistently rank energy efficiency among the top two or three qualities desired in a new home. Since the energy cost increases of the 1970s there have been numerous new products and approaches to energy efficient construction, challenging both builders and buyers to balance new product costs with energy savings. But home buyers are often confronted by a lack of comprehensible standards of energy efficiency.

Decisionmaking by both buyers and builders has also been hampered by a lack of information on new products and building techniques, an evaluation of a 1985 pilot workshop and needs assessment revealed.

Training Project
In 1986, to meet this need, Extension Community Resource Development (CRD) specialists at the University of Massachusetts cooperated with builder's organizations and the Massachusetts Office of Energy Resources to conduct one-day workshops throughout the state called: The Builders' Training Project. The workshops were designed to reach home contractors, home buyers, and carpentry students with information on building more energy efficient homes.

Evaluation of these workshops has yielded significant insights into methods of reaching building trades professionals and their adoption of new products. Home builders were concerned about the effectiveness of new products and the willingness of buyers to pay for greater energy efficiency. Many felt that expenditures for energy efficiency were not readily noticed by buyers.

In early 1986, when specialists at the Office of Energy Resources funded a series of workshops, they believed that contractors lacked access to technical training and would attend conveniently located and reasonably priced workshops. Workshops for home buyers and carpentry school students were included to stimulate increased interest from these groups.

Marketing The Program
Home contractors were identified as the primary audience for the project. Extension CRD specialists designed a full-day workshop format and marketing approach with an advisory group representing building officials and contractor associations. Cosponsorship was solicited from local utilities, contractor associations, and trade magazines.

The primary means of marketing was direct mail. Local building inspectors and lumberyard owners supplied names of contractors. Representatives of trade associations and a regional construction magazine contributed mailing lists. In the direct mail brochure, cosponsors were prominently identified. The low $15 registration fee was an added inducement.

For the initial spring 1986 workshops, 75 percent of registrants learned of the workshops through direct mail. Home buyer workshop advertising employed press releases and a county Extension newsletter.

Effective Program Design
The workshop design provided a thorough review of current materials and options for constructing various portions of the home and selecting mechanical equipment.

Sessions on moisture, indoor air pollution, and marketing of energy efficient homes were designed to address significant issues related to energy efficiency. As a supporting document, participants were given *The Super Good Cents Construction Manual*, a publication developed by Extension at Oregon State University.

The Builders' Training Project reached 1,400 building trades persons, 400 students, 80 instructors in woodworking at vocational technical high schools, and 75 home buyers.

Response
For 62 percent of the participants this was their first training conference. Only 28 percent of the builders reported membership in a trade association.

Questionnaires indicated that 98 percent of the participants felt the topics were appropriate for their needs; 74 percent of the participants indicated they wanted to change a construction practice; and of this latter group, 91 percent felt they had received enough information to make the change.

The 2-year duration of the Builders' Training Project provided an opportunity to present to new clientele issues with potential for significant economic benefit. Economic benefits resulting from energy conserving products and construction methods can return fuel savings worth several times their initial costs during the lifetime of a structure.

A followup survey employing a control group is seeking to evaluate actual behavior change of participants.

Extension applied skills in organization and educational program design to an issue outside the traditional areas of Extension programming. Through the project, Extension delivered an effective educational program using grant funds and working in cooperation with state agencies and trade associations. ▲

Jeffrey H. Schiff
Executive Director,
National Association
of Towns and
Townships (NATaT)

(Continued from page 2)

Many small towns are struggling for their very survival, attempting to cope with declining agriculture, manufacturing, mining, and lumbering. Dwindling tax bases, decreasing land values, and funding cutbacks are resulting in fewer jobs and fewer opportunities in our hometowns. Small town populations are aging as young people who cannot afford to raise their families where they grew up move away.

Too often, local efforts to create jobs in small towns rely almost entirely on industrial attraction. Small towns hope against hope—in a highly competitive and costly environment—that they can compete successfully against larger, wealthier communities in attracting branch plants and other large businesses.

Our work at the National Association of Towns and Townships (NATaT) indicates that a different approach is needed to deal with economic development needs of small town America. Our "Harvesting Hometown Jobs" program doesn't look to far away places for economic salvation; it emphasizes *local* resources, *local* people, *local* solutions. These are strong, important traditions in small town America, and they can be used to help with today's problems.

This approach looks to developing homegrown jobs; it encourages the retention and expansion of existing businesses, development of home-based enterprises, stimulation of local entrepreneurs, use of value-added agricultural processing, and growth of local tourism opportunities.

We also must play to our "strong suit"—our people and sense of community. Small town economic development can be an important, productive modern day outlet for the public-spirited traditions of barn-raisings and "pitching-in" to clean up after a natural disaster.

Let's organize our people for today's challenge of creating jobs. Local officials, bankers, business owners, Extension agents, members of regional councils, churches, utilities, the PTA, and community colleges—all have a role to play.

Local people are best at identifying what the community wants and needs. They know how to get the job done; they always have. And we should be utilizing that spirit! ▲

If you would like more information about our "Harvesting Hometown Jobs" program, please contact:

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