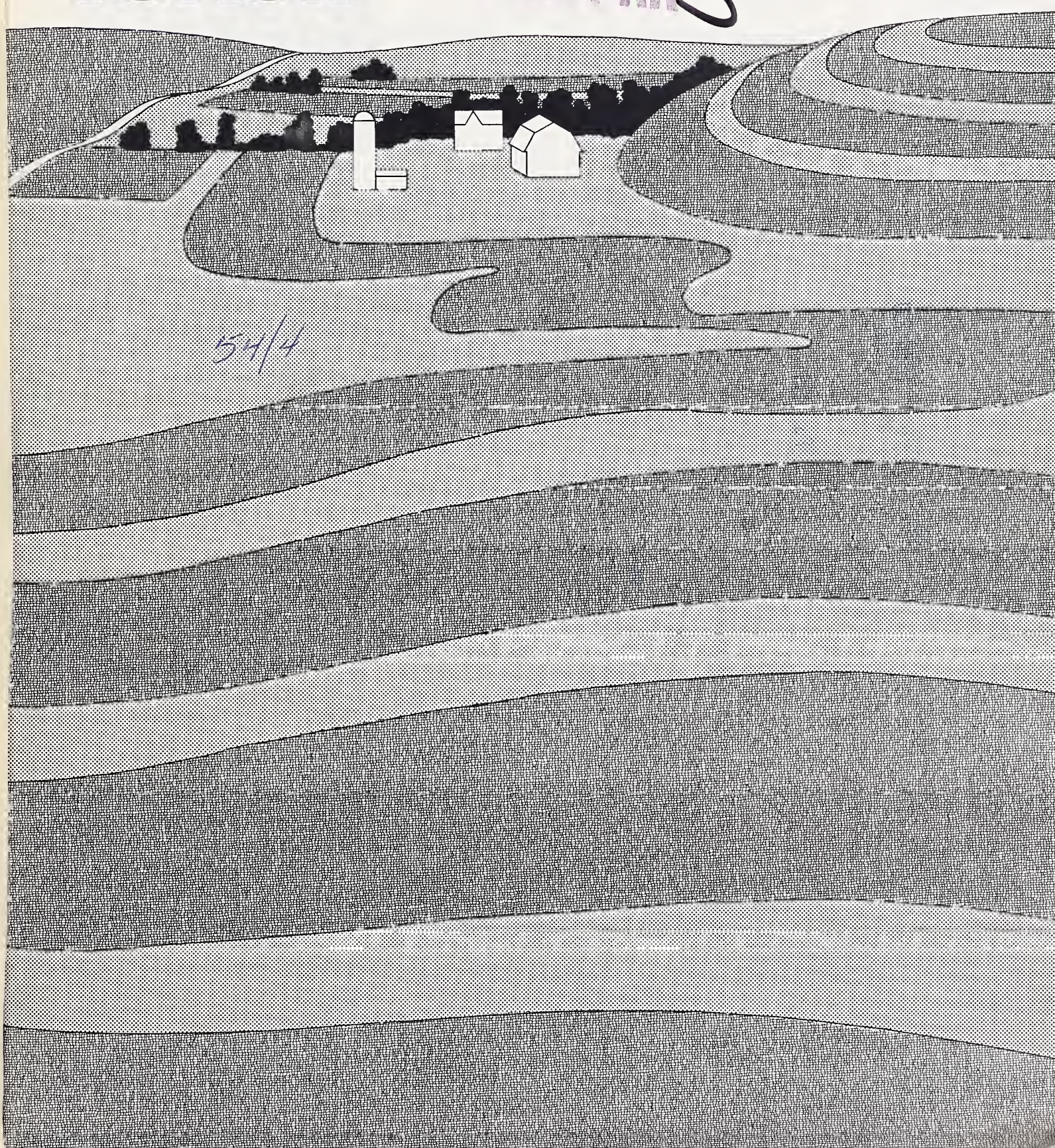
1983 United States Department of Agriculture

extension review

Land Use Management



review

Agricultural Scotomata: A Limiting Vision of the Future

What is "Agricultural Scotomata?"

"Scotomata" is a medical term meaning "dimness of vision—a blind or dark spot in the visual field" and too many engaged in agriculture may suffer from the impairment today, says *Dr. Russell G. Mawby,* Chairman and Chief Executive Officer, W.K. Kellogg Foundation, Battle Creek, Michigan. He presented the Extension Service Annual Seaman A. Knapp Memorial Lecture at the meeting of the National Association of State Universities and Land-Grant Colleges, Washington, D.C., Nov. 14.

Mawby challenged the land-grant audience: "Do we in agriculture have enough breadth of vision; do we see far enough; do we comprehend broadly enough what agriculture can and should be at the turn of the century and beyond?"

Mawby expressed concern around five points:

1. *The stature of agriculture within the university must be elevated through conscious effort by those in agriculture.*

He stressed that whereas in earlier days, agriculture was recognized as the moving force behind the creation of the land-grant institutions and was dominant in the structure, generally this is no longer the case. Other units of the university have grown at the expense of agriculture.

2. *Colleges of agriculture must continually demonstrate their efficacy in addressing issues of current vital public concern.*

He pointed out that as American society moves to the end of the 20th century, the issues at the top of its agenda have changed... to such things as concern for environmental quality, and nuclear arms, and the concept of health promotion/disease prevention.

He said: "As regards to physical well-being, an adequate supply of nutritious food is essential. While the primary mission of colleges of agriculture is the production and processing of food stuffs, implications for human nutrition is seldom a major element in programs of teaching and research. More often, curricula and courses emphasize productivity and profitability of the agricultural enterprise."

3. *Land-Grant colleges of agriculture should assure the coordinating leadership role in our nation's programs of agricultural research.*

Mawby said that the U.S. Department of Agriculture was essentially a research and education organization from the passage of the Hatch Act in 1887 through the 1930, but that beginning with farm programs initiated in the depression years, the USDA has been transformed into a conventional, governmental, bureaucracy managing varied programs of direct benefit to specific groups of farmers, consumers, and other special interests. He said that in 1930 USDA agricultural research activities accounted for a large part of its budget, but today they account for less than two percent of the USDA budget.

4. *Colleges of agriculture should contribute more actively to the processes of agricultural policy development.*

"As in the instance of agricultural research, agricultural policymaking has been altered substantially by farm programs which began in the 1930s," analyzed Mawby. He pointed out that for a hundred years farmers took the initiative in determining agricultural policy. Today those who want to influence decision-making and define policy agenda in agriculture must cooperate with non-farm sectors of the economy. It is apparent that the scope of traditional farm policy has expanded. Unfortunately, while the process of policy setting agriculture has become more tumultuous and the issues more urgent, the engagement of colleges of agriculture in this area of public concern seems to have lessened.

5. *Colleges of agriculture should launch new initiatives in continuing education, augmenting their traditional commitment to life-span learning.*

Mawby concluded: "I think it is fair to say that the land-grant universities have not been at the forefront in the development of external degrees. This seems particularly true in agriculture. Your college of agriculture is probably the only college in your university which has

Mary Nell Greenwood, Administrator, Extension Service-USDA, presents the Bronze Medal of the Seaman A. Knapp Memorial Award to Russell G. Mawby, chairman and chief executive officer, W.K. Kellogg Foundation, at the meeting of the National Association of State Universities and Land-Grant Colleges in Washington, D.C.

faculty members resident in every county of the state. Yet, typically, and in fact with only one or two exceptions to my knowledge, colleges of agriculture have done nothing in the creation of external degree programs of study to enable practitioners to complete the requirements for baccalaureate or advanced degrees."

Mawby recognized Dr. Seaman A. Knapp, founder of the Extension demonstration system of education for adults, with this summary:

"By vote of Congress, the two major buildings of the USDA in Washington are joined by a pair of graceful arches. One on the east is a memorial to Seaman A. Knapp and the one on the west commemorates James Wilson, who brought Knapp into the Department and supported his work. Whenever I see these arches, particularly the one on the east, my spirits are uplifted, but I know that the true memorial to Knapp is not there. It is to be found in part in the colleges of agriculture in the teaching, research, and Extension functions which they sponsor and which he helped to create. Even more powerfully and directly, his influence is to be found in the agricultural enterprises of this country, all of which in some measure rests on the bedrock of his thought and effort.

"May we be as adequate in our time as Knapp was in his."

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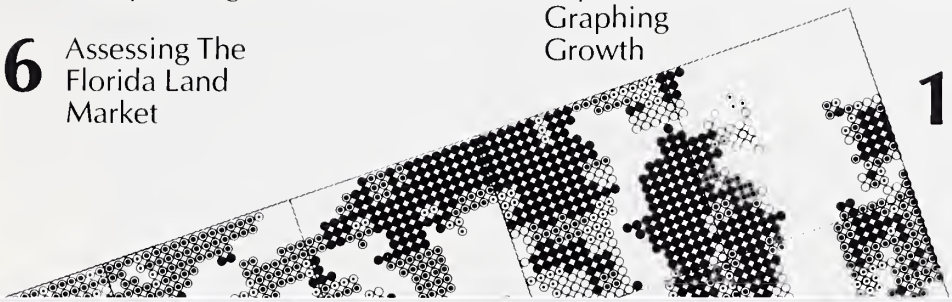

extension review

Vol. 54 No. 4
Fall 1983

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 through September 30, 1985. 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: The Editor, Extension Service, Room 3135-S, USDA, Washington, D.C. 20250. Telephone (202) 447-4651.

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Mapping for the Computer Age

Gail S. Ludwig
Extension Geographer
University of Missouri-Columbia

Above: Geographer at the Geographic Resource Center analyzes satellite data for land use mapping.

Left: Satellite imagery from LANDSAT, a land resource satellite, depicts a computer-generated land use map of Missouri river bottomland. Extension geographers at the Geographic Resource Center, University of Missouri-Columbia, use the invaluable data from LANDSAT for land use mapping projects and for monitoring land resources.

Many people experience confusion and disbelief when returning to their childhood home after a lengthy absence. Often the landscape has changed so drastically that locating something as simple as the family farm may not be an easy task. An interstate highway may have replaced the gravel road, a convenience store may mark the location of the neighbor's house or the silhouette of a shopping center may dominate the horizon instead of a forest filled with childhood memories.

Origin: Biplanes and Cameras

Changes in land use occur continuously and often it takes an extended absence from an area to clearly see how much has changed over the years. Prior to the development of cameras and recording systems, the majority of mapping was done on foot by surveyors and explorers. World War I brought together the airplane and camera and the development of aerial photography for mapping purposes began. Technological advances in aerodynamics, photography, mapping equipment, and the advent of computers and satellite systems have ushered land use mapping into the high-tech fields of remote sensing and computer cartography.

A major headache encountered when preparing land use maps is updating the information on a timely basis. The cost of gathering land use data "on foot" is often prohibitive, so much of the data is collected using aerial photography. Because of the time necessary to photograph, process, and interpret the results, the information is frequently out of date before mapping can be completed. This problem brings into light a major issue faced by geographers, planners, and all Extension personnel involved with land use. What is the fastest and most economical method of preparing and updating land use maps for an area?

Geographic Resources Center

Since the early 1970's the University of Missouri Extension Division has assisted state and federal agencies, businesses, and industry in land use mapping projects. The map products and data being produced captured the interest of enough individuals so that an interdisciplinary center for applied research was established in 1980. The Geographic Resources Center (GRC) provide expertise and assistance to those involved in land use mapping and applied cartography.

GRC focuses much of its research on data generated by the series of land resource satellites called LANDSAT. The first satellite—launched in 1972—caused a revolution in mapping and land use research.

LANDSAT is calibrated to record information on land cover and land use from an altitude of over 500 miles. The recording system on the satellite is designed to distinguish land use patterns of areas greater than 1.1 acres. The advantage of this system is that land use data would be collected monthly, if not more often, when more satellites were made operational. Since the first launch in 1972, three other LANDSAT satellites are in orbit and the technology for interpretation and application of the data has increased significantly.

Inventorying the Earth

As an arm of Extension the Geographic Resources Center works with

North and Central America from the viewpoint of a weather satellite.

many state and federal agencies and industries using the wealth of information generated by LANDSAT. Sample projects include: inventorying and monitoring soil, water and related resources in various counties for the Soil Conservation Service; analyzing ground cover for the wild turkey population in the northern portion of the state for the Missouri Department of Conservation; completing a trade area analysis for a state based farm cooperative; and analyzing forest lands for a private timber company.

The role of GRC as a major state research facility for monitoring land resources has proven to be a valuable addition to the Extension program in Missouri. Work on test projects has progressed steadily. The potential for developing a land monitoring system that can be based at the GRC facility with "dial-up" access via microcomputers in county Extension offices throughout the state is excellent. Thus Extension personnel could have immediate access to land use and land cover information.

Monitors Vegetation

Recently, GRC has worked with the National Oceanic and Atmospheric Administration (NOAA) to use weather satellite data to monitor vegetation throughout the world. There are several advantages to using this data for land use monitoring: it is cheaper to collect and process; daily images are available for most parts of the world; and products can be obtained within three weeks of the collection date. This satellite is being tested as another possible method of collecting and analyzing land use and land cover data.

Future Projections

The changes in land use mapping that have occurred in the past ten years are not showing any signs of abating. Like the development of the computer, land use mapping has progressed at an unbelievable rate since satellites were first used as monitoring systems.

In the future, it may be common place to have a continuous land monitoring system available in every Extension office in the country. Changes in land use may be detectable as soon as they occur. Determining answers to questions about land use changes or the number of acres of wheat, corn or any other crop being grown in your area may be as easy as turning on your computer and placing a telephone call to hook up with the satellite overhead! □

Assessing The Florida Land Market

David Mulkey and Rodney L. Clouser
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Since the midseventies, preservation of agricultural land has received a great deal of attention in nationwide policy debates, and increasingly this debate has resulted in concrete policy actions. Forty-nine states have some form of use value assessment for agricultural lands, 38 states have some form of "Right to Farm" legislation, 22 states have adopted agricultural zoning, 15 states have enacted agricultural districting programs, 10 states have adopted transfer or purchase of development rights programs, and 11 governors have issued executive orders encouraging the minimization of farmland conversion.

Many city and county governments have also taken steps to discourage the conversion of farmland. The 1981 Food and Agriculture Policy Act specifically addressed farmland preservation. It requires all Federal agencies to determine the impact of their programs on farmland conversion and to develop plans to minimize those impacts. Thus, farmland preservation is a reality that dictates a broader focus for Extension programs.

The Land Market System

Each individual landowner, guided by self-interest, makes decisions regarding the use of land under his or her control. Thousands of individuals making such decisions results in a process loosely referred to as the "land market." Parcels of land are bought and sold for a variety of uses over time. A particular mix of land uses in any area comes about due to the interaction of supply (soil types, climate, location, water availability, transportation systems, and so on) and demand (amounts people will pay to use land).

Some government control exists in the land market. Landowners must consider rules and regulations designed to ensure that the market works in an orderly manner or to influence the outcome of the process. Just as governmental rules and regulations effectively constrain or limit the actions of landowners, the governments are subject to the constraints imposed by the state and Federal constitutions.

Implications for Extension

At least three levels of decisionmaking are represented in the land market: (1) landowner, (2) legislative/administrative, and (3) constitutional. Changes at any of these levels affect the amount of land devoted to various uses.

Landowners constantly change their actions in response to rules and regulations and to changing market conditions. Administrative and legislative bodies often change rules in response to political pressures and perceived social needs. The constitution itself is subject to judicial interpretation and change through the amendment process.

Extension education programs involving agricultural land preservation should operate within the framework of land markets and government rules and regulations. They need to focus on rule changes and how they affect the way in which farmers/landowners operate. Agricultural landowners have a vested interest in these rule changes—they stand to gain or lose as their rights to use land are expanded or contacted.

Nonlandowners have a less direct but equally valid interest in rule changes. Quality of life in local communities, environmental quality, food prices, and food availability are related to the amount of land in agricultural use. Agricultural land preservation education programs need to reach producers, elected officials, planners, and public agency administrators.

Extension programs for the agricultural producer may be made useful by a focus on understanding the policymaking process and evaluating alternative outcomes of the process. Farm clientele (landowners) have a vested interest in the outcome of farm perservation programs and need to be involved in the policy process. It is essential for them to understand current land use policies at the local, state, and Federal level. Once basic information has been disseminated, Extension programs can address how farm groups and individuals can get involved in the policy process.

With traditional farm audiences, Extension programs should present and evaluate farmland preservation alternatives. Agents should provide information that allows the farmers to deal with program costs, who pays the costs, level of government involved, potential changes in property rights, and compensation for changes in those rights.

Useful for Clientele

These program suggestions could also be used for nonfarm Extension clientele. These groups attempt to influence agricultural programs yet they often have little knowledge of agriculture.

Extension should attempt to provide material to enable these clients to gain a broader understanding of agriculture, and its problems, and the impacts of various policies. Numbers and types of crops, agriculture's contribution to local jobs, income and tax revenues, and needs for inputs such as water and energy exemplify this type of information.

For the best informed decisions, all participants in the policy process need to be aware of current rules, understand how the rules are changed, and realize the farm and nonfarm implications of changes in existing rules and regulations. □

Economic Impact Models—Graphing Growth

Leon E. Danielson
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North Carolina State University, Raleigh

Dubbed a "rural turnabout," population and housing growth during the early 1970s shifted greatly from metropolitan to nonmetropolitan areas throughout much of the nation. Growth pressures were greatest in the South and West.

The shift was welcomed and often promoted by many who had observed the decline of rural areas for decades. But it has also raised land use issues associated with growth and development that are receiving increased attention throughout rural and small-town America. Some of these issues are retention of farmland; nuisance suits and complaints over farm odors, noises, dusts, and chemicals; and water quality.

Also being questioned is the ability of local governments to respond to changing demands of a rural population that is becoming increasingly more nonfarm oriented. A recent survey of 320 university faculty in the South by the Southern Rural Development Center identified the number one rural development issue as the "impact of growth and development on the demand for and cost of services." Extension is aware of these changes and is developing programs to meet these needs.

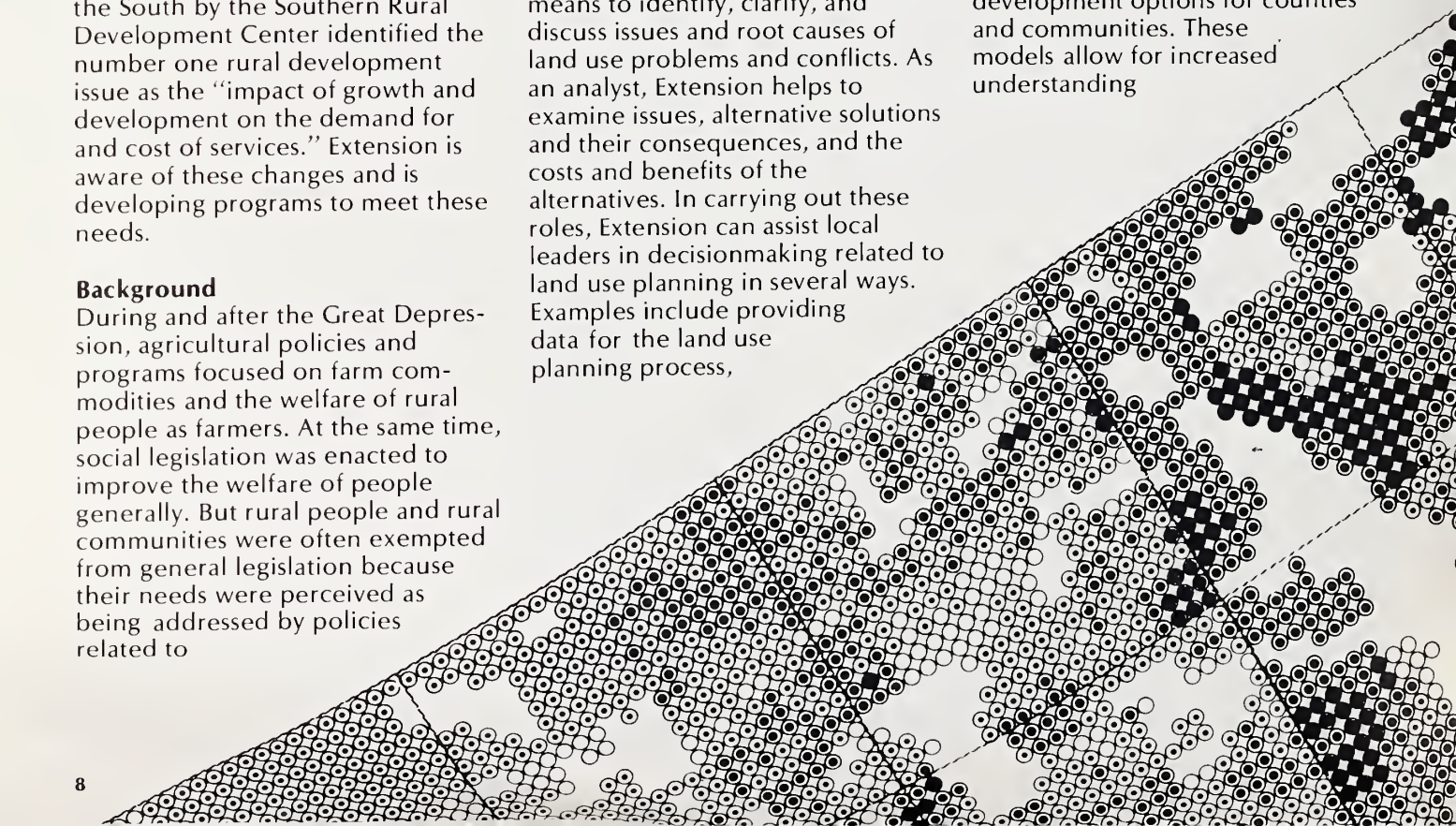
Background
During and after the Great Depression, agricultural policies and programs focused on farm commodities and the welfare of rural people as farmers. At the same time, social legislation was enacted to improve the welfare of people generally. But rural people and rural communities were often exempted from general legislation because their needs were perceived as being addressed by policies related to farm commodities. With the primary focus on agricultural producers on the one hand and urban workers on the other, many issues of concern to rural people and communities were often overlooked.

Today rural residents want their small towns and counties to provide a higher quality and much wider variety of services and facilities than in previous years. They want improved school programs and facilities, emergency health care, and a host of other services. Local funding must be adjusted, especially as "new federalism" becomes a reality, and different amenities must be provided. To a large extent, these services will be of an urban nature, but they often must be provided by rural, not urban, institutions.

Extension Roles
Alternative roles that Extension might play in land use planning are to "create awareness" and to serve as an "analyst." To create awareness means to identify, clarify, and discuss issues and root causes of land use problems and conflicts. As an analyst, Extension helps to examine issues, alternative solutions and their consequences, and the costs and benefits of the alternatives. In carrying out these roles, Extension can assist local leaders in decisionmaking related to land use planning in several ways. Examples include providing data for the land use planning process, identifying and clarifying issues, identifying alternative land use policies available to solve issues and problems, assessing the impact of alternative land use policies, and analyzing the net impacts of alternative types of future growth and development.

Extension analyzes the impact of growth and development on small towns and counties in a variety of ways. Studies of specific resources have provided estimates of water and sewer systems demands expected if certain levels or types of growth and development occur in the area. Analyses of fire protection alternatives, school location options, and waste disposal systems help officials make cost-effective decisions.

Economic Impact Models
Recently several states have constructed economic impact models to assess the impact of land use changes and alternative growth and development options for counties and communities. These models allow for increased understanding



of the complex linkages between various sectors of the economy and the overall net impacts of growth. Without such information, there is a tendency to concentrate solely upon the gross benefits of development and to overlook costs and unforeseen impacts that might also occur. Early models focused upon estimating employment and income impacts of industrial growth. More recent efforts are providing a wider variety of information, including public service requirements of growth, fiscal impacts upon local government, and detailed demographic impacts.

For example, a model developed in Oklahoma has four components: an economic account, a capital account, a demographic account, and a government account. The models can be quite detailed. A recent study of a North Carolina county projected household income, household employment, and governmental revenues resulting from growth and development. Governmental revenues were estimated from impacts upon the level of business and residential property tax, sales tax, utility franchise tax, intangible tax and motor fuel tax. On the other hand, local public sector costs were estimated from the projected increase in population. Kentucky has developed an interactive approach whereby users provide information directly into a computer impact model by answering a series of questions. This uses the Extension analyst's time efficiently, provides impact results in only a few minutes, and allows the user to change an input value and immediately see the impact of that change.

Although work remains to be done, Extension is helping local citizens and elected officials make more informed decisions as they meet the challenges brought about by land use changes and development pressures. □

Land in Agriculture

Verne W. House
Extension Economist
Montana State University, Bozeman

A few farmers have told me: "The most effective way to keep land in farming is to raise prices for what we sell." Ask a farmer if he or she wants to keep land in agriculture and the most likely answer is "You bet I do!" And I believe them. However, farmers also believe in preserving property rights. Farmland with conversion potential is unlikely to stay in farming unless government intervenes. The potential for capital gain dominates decision on land use. As for protecting property rights, farming tends to be a risky and personal business. The retirement fund is often in the form of salable land.

Mixed values produce mixed motives and, in turn, a variety of methods of keeping land in farming. So, the current situation represents a compromise among measures. Attempts to maintain land in agriculture are categorized below. I define planning as information gathering with potential recommendations. For example, planning may utilize a Soil Conservation Service (SCS) soil survey to develop recommendations but planning itself does not implement those recommendations. Planning is defined in each state's laws.

Regulations
Several methods of maintaining land in agriculture are regulations based on government's power to police as defined in our national and state constitutions. In this group are commonly known often controversial methods—zoning, subdivision regulations, and building codes.

Incentives and Subsidies
A second group includes incentives and subsidies implemented through our tax systems. The most common (and least effective) of these are the so-called "Greenbelt laws" which tax farmland on its value as farmland regardless of its potential for housing, industry, or other use. Most states have some type of "Greenbelt law." While these tax breaks may be justified, numerous studies have documented their ineffectiveness. The sliding scale capital gains tax could keep land in farming but it is not commonly used.

Alternatives
Controversy over some of the regulatory and tax methods has encouraged planners to search for alternatives. This search has gone in two directions. One is to combine methods into approaches that work and are acceptable. In this group is Wisconsin's Farmland Preservation Program; it provides some income tax credit to farmers in counties with an agricultural preservation plan and more if it also has exclusive agricultural zoning.

Other states and organizations are using and promoting a combination of public and private incentives. For example, the Montana Land Reliance has a "donor-assisted management program". The organization purchases agricultural properties and leases them out. Investment capital comes from private donors who receive significant tax deductions.

Units of government can sometimes influence private investment locations by designation of business/industrial parks and control over arterials, highways, and schools. More often, government responds to rather than influences private development.

Another category of methods requires development of literature, lobbying, and organization. These include education, persuasion, and propaganda. No one is likely to admit using propaganda (every interest group calls its effort education), but much intentional slanting of information occurs. For example, when the USSR and China bought large quantities of grain in 1972–73, some people predicted domestic food shortages and hoarding. The longshoremen responded by refusing to load the grain.

Nonregulatory Techniques
Whether we call it education or persuasion, "nonregulatory techniques" are being used to encourage people to be "stewards of the land," and to consider alternatives to market-dictated growth patterns. In general, education, persuasion, and propaganda pit "land ethic" against "the profit motive."

High interest rates contribute to retaining land in agriculture by dampening demand for homesites. High interest rates have been rationalized on other grounds. So we do not usually consider monetary policy among the alternatives.

What methods appear to be both effective and acceptable? Wisconsin's official reports claim success. Oregon's complex system of mandatory local planning, exclusive farm zones, and urban growth boundaries has been controversial but seems viable.

LESA

The new acronym to know is LESA, Land Evaluation and Site Assessment, a significant advance in SCS's well-known methods of land evaluation (LE). Land evaluation is based on soil productivity regardless of location. LESA includes site assessment, too.

LESA has been favorably received.

In summary, LESA is much more comprehensive and useful than its predecessors for local land use decisionmaking. It provides a consistent, technically defensible method of evaluating agricultural viability, yet it has flexibility to encompass a variety of local conditions and circumstances.

LESA could potentially be useful with several types of farmland retention policies. For example, it could be used in conjunction with agricultural zoning, agricultural districting, or purchase of development rights.

This system also has other potential uses. For example, it could be used for farmland property tax assessments, particularly in states with a use-value assessment program. State and federal officials could use the system in making environmental impact statements or environmental check lists. And the system could be used to help determine the best location for new water, sewage, and transportation systems.

Secretary Block has issued an official policy statement that USDA programs will protect agricultural lands. A statement in the Congressional Record of July 12, 1983, announces his intent that LESA be the method used. Although LESA depends on soil surveys (which have not been completed for many counties) and the methods of implementing LESA are not yet determined, LESA is a method worth studying. At least, it should improve our information base, our understanding, and our involvement in determining how our agricultural land will be used.

Extension agents and specialists are educating people about agricultural land use in many ways. For example, they suggest (1) increasing understanding about the role of agriculture in the economic base; (2) developing and disseminating accurate estimates of conversion of agricultural land to other uses; (3) helping citizens identify and evaluate alternative public policies to reach their objectives. □

Plowout: Cropland Conversion in Montana

James B. Johnson
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Converting traditional grazing lands to cropland has aroused strong interest and emotions in Montana and several other western states. Major reasons for conversion include provisions of the federal farm commodity programs, and certain federal income tax provisions.

Example of a Conversion
In preliminary study, we looked at these factors: capital costs for converting rangeland to cropland; differences in tax rates on capital gains ordinary income; investment credit; and an increase in wheat price. Economic effects of these factors were estimated for a 2,000-acre conversion in eastern Montana:

Year 0 (now)—purchase rangeland at $100 per acre and plow rangeland;
Year 1—leave fallow the plowed land and plant 2,000 acres of wheat in the fall;
Year 2—harvest (obtain some crop) and summer fallow;
Year 3—leave fallow entire area and plant in the fall;
Year 4—harvest 2,000 acres of wheat (obtain reasonable crop) and fallow;
Year 5—sell the 2,000 acres as cropland.

Break-even cropland prices for the investor in the fifth year were calculated for several marginal income tax rates.

Impacts on Tax Rates
In the example, when initial capital outlays were doubled for converting rangeland to cropland, the break-even selling price for cropland rose only slightly. Investors at the zero percent marginal tax rate would incur all of the increase in conversion costs. Those at the 50-percent marginal tax rate would incur only half the increase, as they could deduct conversion costs immediately against their tax liabilities on other income.

An investor at the zero marginal tax rate does not benefit from reduced tax rates on capital gains versus ordinary income. However, investors at higher marginal tax rates can deduct costs they incur in transforming rangeland to cropland against tax liabilities on ordinary income. The investor with a high marginal tax rate defers taxes. Eventually, the investor pays at the lower capital gains rate, which is only 40 percent of the marginal federal income tax rate on ordinary income. The reduced capital gain tax rate means that the break-even selling price of cropland is reduced considerably for investors at the higher marginal tax rates.

The potential investor at the zero marginal tax rate cannot take advantage of investment credit. However, investors at all other marginal tax rates can obtain about the same benefits from investment credit. Therefore, no matter what the investor's marginal tax rate is, investment credit has about the same impact on the break-even selling price. (We assume the investor has enough tax liability on other income to use the investment credit.) All taxpayers with tax liabilities generated by other income could reduce their liability by 10 percent of the depreciable assets, subject to investment credit in the first year they use the qualifying assets.

Programs Affecting Conversion
Government programs have two possible effects on the investor who converts rangeland to cropland. First, the investor gets greater revenue from government payments during the period in which the investor owns the land. This impact could be viewed as a price increase. As long as government payments are relatively small (that is, similar to a wheat price increase of 50 cents a bushel), the influence would be relatively small and more beneficial investors with a higher marginal tax rate than to those with a lower one.

Second, the investor could get a higher selling price for cropland if it is likely to qualify for future government programs. The increased profits would be capitalized into increased selling prices. The higher selling prices for cropland would be about the same in any marginal tax rates.

So the capital gains provisions of the Federal income tax code provide a major incentive for investors in the higher marginal income tax brackets to convert their rangeland to cropland. This finding does not mean that government programs would not benefit an investor who intends to sell converted land if the new cropland qualifies or is expected to qualify for the farm program.

Possible Policy Options
People attempting to limit conversion of rangeland to cropland by decreasing incentives may wish to consider revising certain Federal tax features pertinent to land conversion. The ownership period required for asset sales to qualify as capital gains could be lengthened. Or deductions of conversion costs from tax liabilities could be disallowed. It is important to consider how these changes would affect both farm and ranch sales by farmer-owners and also investments in land and water conservation improvements. □

Oregon Defines Commercial Agriculture

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Underway in Oregon is a major program to protect the state's commercial agriculture land base—a program that affects more than 18 million acres of privately owned land.

As this program progresses, two problems are increasingly apparent: 1) an inadequate data base and criteria for determining which land to protect exists, and 2) data to identify characteristics of commercial agriculture is lacking. This information is needed by each county in order to comply with statewide standards on agricultural land use.

Local planning agencies turn to county Extension offices for help with defining commercial agriculture or in evaluating farm management plan proposals so that they will meet the commercial agriculture standard specified in the statewide land use goals. This standard requires that land divisions or farm dwellings in "Exclusive Farm Use" zones be of such size as "shall be appropriate for the continuation of the existing commercial enterprise within the area."

The confusion and litigation over what scale of operation contributes in a substantial way to the agricultural economy has been expensive to some counties. In 1981, the Land Resource Management Program of Oregon State University Extension Service undertook a study, funded by the Western Rural Development Center through the Rural Development Act, to establish a data base for use in describing the characteristics of commercial agriculture throughout the state. The study was undertaken in three phases: (1) a review of existing data; (2) a contract with the U.S. Bureau of Census to provide new data tables for Oregon; and (3) a county level survey of farmers.

Study Phases

In phase one the staff reviewed published census data and completed county surveys and other reports to determine the usefulness of existing data. From this information, staff members identified and outlined six characteristics of commercial agriculture pertinent to the study which required additional data. Extension then contracted with the U.S. Census Bureau to prepare a computer model for tabulating this raw census data at the county level.

The new data tables, compiled by the Census Bureau, were delivered to the land resource management specialist in September 1982. The data are tabulated by Standard Industrial Classification (SIC) Codes for 11 types of agriculture and by 6 size categories.

The tables can be used to obtain the scale of operations that make "substantial" contributions to the market; to determine the dominant types of agriculture in a county by number of farms, by number of acres, and by value of products sold; to determine the percentage of leased and rented lands; and for a number of other interpretations.

Table Dissemination

The OSU Extension Land Resource Management Program disseminated these tables to each county Extension office in the state. The staff discussed their purpose and application through seven regional workshops, several other presentations, written communications, announcements in newsletters and journals, and in radio spots on the Extension radio network.

The Bureau of Census will keep the computer program on file for other states to use. Costs of running the program for a county, region, or state are quite modest. Inquiries on costs and time frame should be addressed to: John Blackledge, Agricultural Division, Bureau of Census, Washington, D.C. 20233, telephone 202-763-5819.

To supplement these data, the OSU land management staff is also working on a county level survey of commercial agriculture. We have completed the survey for three counties and will use the results as baseline data for three state agricultural districts.

The data from these county surveys is keyed to the SIC codes (as used in the census tables), to types of agriculture, and to geographic areas of the county. For example, if a person wanted to know about field crops in bottomlands or Christmas tree farms in foothills, the county survey data show average farm unit size, gross income, field size, annual operating costs, capital investment, marketing, and other information. The data can be used in a variety of ways. County Extension agents can prepare profiles of individual types of agriculture (similar to enterprise data sheets), a summary of description of agriculture in an area of the county, or agricultural statistics for the county as a whole.

The census tables and the county surveys provide, for the first time, a data base for agricultural land use policy and for zoning decisions. The data are now being used as the primary source of documentation for county land use plans and for state review of the plans.

While other land use issues are languishing, many states have enacted agricultural land legislation in the last 2 years. Defining commercial agriculture for land use decisions will remain a significant problem in the future for other states with agricultural land preservation programs. □

The Prairie Tree Project

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The Prairie Tree Project, a cooperative effort focused on windbreaks planted in the thirties, has strong roots in the past and high potential for the future. Initiated by Nebraska and Kansas Extension specialists and staff members from other natural resource agencies in the two states, the project stems from the Prairie States Forestry Project, a major undertaking of the U.S. Forest Service to establish windbreaks in the Great Plains in the thirties and early forties. The intent is for residents of Kansas and Nebraska, yet unborn, to enjoy the benefits of windbreaks as a result of the current project.

A Brief History
The Prairie States Forestry Project, better known as the Shelterbelt Project, was the brainchild of President Franklin D. Roosevelt. The idea for the project was supposedly conceived during a presidential campaign visit to Butte, Montana in the summer of 1932. Reportedly, Roosevelt was dismayed at finding no tree there to provide him shade on a hot July day. He was also deeply concerned about the rampant soil erosion, the failed crops, and, later, the economic troubles in the Great Plains produced by the drought of the mid–thirties.

Roosevelt's plan was to plant shelterbelts in a strip 100 miles wide stretching from Canada to the Gulf of Mexico. Although not fully completed, the plan resulted in the establishment from 1935 to 1942 of 18,600 miles of linear plantings occupying 240,000 acres on 30,000 farms. All together, nearly 220 million trees were planted in North Dakota, South Dakota, Nebraska, Kansas, Oklahoma, and Texas.

Nebraska and Kansas were the leaders in the effort with 4,169 and 3,541 miles of windbreaks, respectively. Conservationists recognized the value of windbreaks for protecting crops, reducing soil erosion, and conserving soil moisture. Windbreaks protect farmsteads and livestock from the harsh winds typical of the Plains environment. Some conservationists believed that planting trees increased precipitation. Carlos Bates, a Forest Service forester, recognized in 1911 that crops protected by windbreaks produced increased yields.

Need for the Prairie Tree Project
Today these mature shelterbelts need renovation to restore their vigor and function. Demands of modern agriculture, particularly the incompatability between shelterbelts and center-pivot irrigation systems, have caused removal of many windbreaks established in the thirties. Over 206 miles of windbreaks in Nebraska were removed during 1970-75.

Enormous production of the American farmer has not been exacted without negative impacts on the natural resources that sustain it. Soil erosion is increasing above acceptable levels. Water resources are dwindling. Costs of non-renewable energy sources are becoming extremely expensive. Thus, the time is ripe for the Prairie Tree Project.

Project Development
Project objectives are to encourage proper management of existing windbreaks and to stimulate the planting of new ones. Extension staff will provide materials with latest available informaiton on benefits, design, planting, and care of windbreaks to landowners.

Information will emphasize multiple benefits, including crop and livestock protection, increased yield, conservation of soil and water resources, conservation of energy, and production of fuelwood.

In the first phase of the Prairie Tree Project, Extension specialists from Kansas and Nebraska brought together experts from resource agencies in the two states to develop educational materials with state-of-the-art information about windbreaks for Extension agents, Soil Conservation Service personnel, Fish and Game biologists, and Natural Resource District technicians. These materials include Extension circulars and other printed information, slide-tape programs, TV and radio spots, and in-service training workshops. Later, staff members will use the materials with farmers. Extension materials are being developed.

Economic Benefits of Windbreaks
Much has been learned over the past 50 years about the economic benefits of windbreaks. Researchers are documenting the magnitude of the benefits resulting from increased crop yields, energy savings, snow management (living snowfence), and improved livestock performance. For example, Jim Brandle, research forester at the University of Nebraska, has shown that fields in eastern Nebraska protected by windbreaks have yielded 23 percent more soybeans and 18 percent more wheat than unprotected fields. Based on the relationship between maintenance energy requirements and windchill, David Hintz, National Windbreak Forester for the Soil Conservation Service, has shown that at 0°F and winds of 25 mph, common winter conditions in the Great Plains, a 660-pound beef animal protected by a windbreak requires 20 percent less feed for maintaining energy than if the same animal were exposed to the wind.

Below: John Schleusener's son Lyle stands in the shade cast by the first Nebraska windbreak trees as they look today.

Bottom: In the mid-1930's these seedlings – planted on the John Schleusener farm near Orchard, Nebraska – represented the first windbreak planted in that state as part of the Prairie States Forestry Project.

Doak Nickerson, District and Extension forester at the Panhandle Station, University of Nebraska, compared costs of erecting and maintaining slatted snowfences along Nebraska roads for snow control with costs of living snowfences (tree windbreaks planted along roadsides that prevent snowdrifts from closing the roads). At today's prices, it cost $5,400 per mile more for slatted snowfences than for living snowfences. Average life span of a slatted snowfence is 5-10 years while that of living snowfence is around 50 years. Over 50 years, living snowfences could produce savings of more than $70,000 per mile.

New windbreak design requires taking much less land out of production than was needed by the windbreaks planted in the thirties. Windbreaks then often contained 10 to 12 rows of trees while today two rows of trees can provide effective protection. Some modern designs allow for the harvest of fuelwood without impairing the windbreak's protective function. The favorable economics described above form the basis for the optimism that the objectives of the Prairie Tree Project will be realized.

A Cooperative Effort

Today, as was true 50 years ago, such an effort as the Prairie Tree Project can only succeed through combined efforts of Federal, state, and local conservation agencies. Those pledging cooperation and support are the governor's of Kansas and Nebraska, the state foresters, the state conservationists, the state directors of the Cooperative Extension Services, Game and Parks Commissions, Departments of Agriculture, Agricultural Stabilization and Conservation Services, Natural Resource Districts, the regional forester, Region 2, U.S. Forest Service, and the executive director of the National Arbor Day Foundation. Future generations will be assured of trees to shield them from the hot summer sun. □

Focusing on the "Pocketbook Issues"

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West Virginia may be a relatively small state, but when it comes to landowners it ranks high. There are over 15 million acres of land in the state; most of this acreage is privately owned and occupied by the 1.9 million residents. Extension educational activities have been refocused on real property issues and have resulted in a more vibrant and useful response from the public.

In 1970, a multidisciplinary statewide land use committee, consisting of representatives of the Farm Bureau, League of Women Voters, and state and Federal agencies was organized. The committee was charged with studying, developing, and making available information on land use issues. The committee has relied upon individuals and small working groups to conduct applied studies, develop publications, and other educational materials, and to conduct forums and conferences. Research support for this work has been strong. Funds to conduct activities have been supplied by the governor's office, state associations, and West Virginia University.

Activities of the committee during the first 8 years were largely centered around the title of land use. About 5 years ago, there was a dramatic increase in such developmental activities as exploration for and production of oil and gas, private recreational investments, farming, use of coal and timber, property taxes, and water rights issues. These "pocketbook issues" have caused a refocusing of efforts with greater emphasis now placed on real property issues. This refocus has prompted a strong public response.

Applied Research Studies
Among the applied research conducted in the past have been such studies in major changes in land use in West Virginia as: public views on land use and environmental issues in Mineral County; state land use laws; and a 9-county study of rural residents in West Virginia. In addition, there has been a 9-county telephone survey of the views of county officials regarding land use issues; an inventory of state-owned land on a county-by-county basis; and an annotated bibliography on land use in West Virginia.

Twenty-two publications have been developed and distributed to over 50,000 people. Eleven of these publications have dealt with land use and 12 with real property.

A state conference on housing was held following a tragic flood which hit the southern part of the state. Over 200 people attended this meeting.

A series of five public forums, conducted with the state tax department, dealt with topics of real property, taxation, property leases and mineral taxes. Over 500 people attended, including industrialists, rural residents, farmers, and elected officials.

Three public forums were held on water rights, coal slurry pipelines, and the water supply problem in West Virginia. Over 3,000 people participated in these forums. An additional 35 meetings dealing with real property issues on oil and gas have been held throughout the state.

Use of Videotapes
An 11-minute slide script presentation on land use was developed and 12 copies were distributed to groups in the state. The were funded by the Governor's Office of Federal/State Relations and have been viewed by over 5,000 participants at meetings. Video tapes were also devloped and distributed to the state television station.

Demands Increase
One of the primary missions has been to provide balanced information to policymakers and residents in the state's land use issues, alternatives, and consequences of the alternatives. By linking up with diverse interest groups such as the Farm Bureau, county assessors, coal, oil and gas interests, League of Women Voters, homemaker groups, elected local officials, and state government and agricultural experiment stations, we have been able to better fulfill the mission under the constraint of very limited resources.

Issues Must Be Identified

One person cannot effectively conduct a public policy program on such a complex issue. To be successful, one must identify the issues, the relevant target audiences, and at the same time tie this information in with the proper research support—in our case with the Division of Resource Management in the College of Agriculture and Forestry. In addition, relevant state agencies have been involved such as the Department of Natural Resources, Department of Agriculture, Governor's Office, Highway Department, Department of Health and Geological and Economic Survey.

Things will continue to happen in West Virginia in the area of land use and property issues. Information developed will continue to be used heavily by various groups. Demands from members of the legislature, Farm Bureau, homemaker groups, and county officials *continue to increase*. The legislature in recent years has enacted laws for: the preservation of agricultural land, the right to farm, a property tax amendment to the State Constitution and oil and gas laws.

At present, the legislative judiciary committee is in the process of establishing a task force to examine issues associated with water rights in West Virginia.

Changes will continue in West Virginia. Balanced, objective program activities offered by Cooperative Extension in conjunction with other working groups continue to be useful to public policymakers and citizens of this state or this issue. □

Emphasis on "pocketbook issues" has caused a refocusing of land use issues in West Virginia. Developmental activities such as the use of coal (far left); an increase in private recreational investments (top); and commercial forestry operations (above) have increased dramatically in the last 5 years.

War On Ugliness

Philip Breeze
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It takes a broadminded person to carryout a statewide program in a way that is unique to each community. All success of an Extension program often depends on a delicate mix of local initiative and state-level direction.

Bob Chapin is accustomed to taking a broad view of things. Currently coordinator of the Mississippi Cooperative Extension Service Land Use Center, Chapin's been a landscape architect and planner for years.

When the chamber of commerce beautification committee came to him for help in making Starkville look better, Chapin set out to design a program for the entire state.

Battle Plans
After declaring his "War on Ugliness," Chapin began to devise his battle plans. Working with the Extension home economist in each county, Chapin enlisted the aid of local organizations.

In some counties help was secured from historical societies, in others it was the garden club or women's clubs that led the fight. Chambers of commerce and Jaycees got involved. Several 4-H clubs organized projects as part of the local effort.

In each area, after a nucleus of soldiers in the fight had been formed, a survey was made. Different counties found different problems. One area might have an abundance of modern buildings, but be burdened by litter and unattractive signs. Another area might have barren streets and decaying buildings.

Frequently the solutions were obvious, and detailed plans were quickly drawn and put into effect. Often, however, the county team needed tactical support from the landscape and design experts in the Land Use Center.

All plans had to meet a set of seven criteria:

Goals established must be achievable. The focus of a plan must be specific, rather than broad and vague. Plans must provide for almost immediate visual impact. Plans must call for and achieve broad-based community involvement. Plans must include followup provisions so that they can be continued from year to year. Activities and programs to educate and increase awareness and sensitivity must be part of an acceptable plan. The appeal of a plan must be positive, as opposed to negative or threatening.

Chapin made a point of developing plans that required as little help from outside sources as possible. "Not because we didn't want the help, but because a do-it-yourself project is most often carried out," he explained.

Now in its third year, the "War on Ugliness" has involved little if any Federal money.

Operations Expand
From an original battle plan of eight operations, Chapin's war has grown to include 13 operations. Detailed outlines for the effective execution of each operation are included in Chapin's "Battle Plan Handbook."

Some of the operations are in effect in almost every county in Mississippi according to the coordinator. And almost every community involved in the war is carrying out more than one operation. Chapin mentioned several towns and cities notable for their efforts in particular operations.

Planning each year in Starkville leads up to a week in the spring when the city provides trash bags to all participants. The city council contributes 25 cents to groups and individuals for each bag of trash collected. A local restaurant provides gift certificates for each bag or specified number of bags collected.

"Operation Bright Spot" is underway in New Albany in northeast Mississippi. This project calls for the beautification of intersections, traffic islands, sidewalks, and roadsides. Garden clubs in the New Albany area chose Red Salvia because of its consistent, enduring color and its tolerance to heat and full sun. Thousands of the plants have been planted along the roads of Union County.

Tupelo has undertaken a comprehensive "Operation Tree Cover." Major thoroughfares in and around the city have been identified and surveyed to establish their need for tree cover. Area residents are encouraged to "give a gift for a lifetime." A $12 donation buys a tree, city crews plant it, and the fire department waters it. No new city funds are needed. The contributor gets a nice certificate and the city another tree. Hundreds of trees have been planted through this program in the last several months.

Poplarville Project
"Operation Downtown" is in progress in Poplarville in southwest Mississippi. Landscape and design experts from the Land Use Center designed a new facade for the entire downtown area of Poplarville. So far, all but 2 of the more than 30 stores have adopted the suggested changes at a cost of about $1,000 or less per store owner.

Extension home economist Mary Hough said the Poplarville project is making a big difference in this town

UGLY

of 2,250 residents. The beautification has begun to attract shoppers from New Orleans, 60 miles away, who come to avoid the hurry and congestion of big city shopping. Two physicians recently moved into the area and both mentioned the appearance of the town as one of the central factors in their decision to move to Poplarville.

"Operation Crepe Myrtle" is underway in the coastal area of the state. More than 2,000 of the salt resistant plants together with oleanders and hundreds of palm trees have been planted along U.S. Highway 90, the gulf coast road running through Mississippi. The three-county effort is just getting underway along the 100-mile stretch from Pascagoula to Pearlington, but eventually the entire route will be lined with crepe myrtle, oleanders, and palm trees.

Chapin said the projects are generally successful and he attributes the success to the fact that the programs are organized, planned, funded, staffed, and carried out at the local level. Poplarville, for example, could have qualified for some Federal money, but they decided they didn't want it with all the strings it comes attached to.

Summary

"We're not showing up and telling these people what they need to do with their town. We're asking their local Extension home economist to tell them that we're here to help them do whatever they decide needs to be done," Chapin said.

And the calls keep coming in. From Escawtapa to Arkabutla, from Pinckneyville to Tishomingo. . .folks call to ask Chapin's help for what they want to do in their town. Together, they're winning the "War on Ugliness!" □

As a result of Extension efforts a state-wide beautification program is underway in Mississippi. "Operation Downtown" enlivens the county court house in Starkville. "Operation Bright Spot" fostered flower plantings at war memorial on campus at Mississippi State University. "Operation Crepe Myrtle" employs crepe myrtle, oleanders, and palm trees to dress up the gulf coast road (U.S. Highway 90).

Rural Land Management in an Urban State

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Although Rhode Island is considered one of the most highly urbanized states in the country, significant rural and exurban areas surround metropolitan Providence. There is a marked contrast between older population centers and the outlying towns—in their land use, environmental attributes, and development policy concerns.

There are no counties in Rhode Island, except for judicial purposes, and the local government is divided among 31 towns and 8 cities. These governments maintain close control of their land management prerogatives. State land management legislation has been defeated consistently by the state legislature.

Therefore, while many have recognized a need to plan for the future of the rural areas of the state in a coordinated fashion, the mechanism to do it does not exist.

Rural Development Policies
For the past 4 years, the Community Planning Curriculum Staff at the University of Rhode Island has been conducting research and public information activities involving land management issues pertaining to small towns. This work is funded by Rural Development Act monies and by support from the Rhode Island Cooperative Extension Service. An output of this activity has been publication of several documents on rural land management problems.

"Rural Centers as Development Nodes" a bulletin prepared by this author, emerged from University efforts to assist rural and small towns in dealing with land development problems. The bulletin sets forth potential growth problems facing rural Rhode Island communities between 1980 an 1990. It proposes a direction for these communities to take that would channel or confine population growth into specific areas of the towns that are best suited for development. Other more environmentally and agriculturally sensitive areas would be undeveloped. This option is offered as an alternative to large lot size zoning districts that encourage sprawl and underutilization of open space and agricultural lands and forests.

With two towns as examples, the report presents the kind of settlement pattern that would emerge if projected 1990 populations for the towns would be channeled into a specified center in each town. The description in the bulletin represents an option for communities to consider in hashing out zoning and subdivision questions which they normally handle ad hoc.

Last year, this information was believed to merit wide exposure in all rural communities, and the district Cooperative Extension offices began to get the information out. However, the context within which these meetings were held did not ignite the interest of local government officials and interest groups either for or against development. Later, a public forum was held at a local public library where the subject of the growth of the town of Coventry, Rhode Island was discussed.

Structuring Policy Meetings
The format of the Coventry meeting suggested an approach to these policy discussions that has proved very successful. It's a format that was used in similar workshops at a number of rural libraries across the state. The structure of the meeting and the library setting encouraged attendance by many local factions and by political officials from town council members to state representatives.

The format stimulated discussion and debate between those who saw the need for further development in the town and those who wanted to maintain the status quo to guard the quality of life and the environmental attributes.

The forums were moderated by the author, which provided a neutral presence and facilitated interaction. The "growth node" policy was also presented as one, though extreme, alternative for allowing growth but also containing it.

A resident historian, known to members of the community for his or her work in local history, made the first presentation of each meeting. The historian gave an overview of the growth of the community and set the context within which to consider current growth issues.

Next, the town planner or town planning consultant traced recent history of land development in the town and described the major planning problems and issues facing the community in the near future.

As a followup to this presentation, the growth node alternative was presented and the meeting was opened to comments by different representatives of development interests. These representatives had been selected in advance of the meeting and briefed on the format for their comment. They included developers, town council members, chairmen or members of the planning board, members of conservation commissions, spokespersons or specialized environmental goups, and in one instance, the Audubon Society of Rhode Island. The town librarian served as coordinator and host.

An important precondition for the success of the session was the ability to attract residnts and speakers with differing points of view. The town librarian chose the date for the meeting, publicized it through local newspapers, radio, and library communications, and persuaded the speakers to participate. This function was critical to the outcome of the meetings; the conventional CES district office informational approach had not proved nearly so successful. District sponsorship may be appropriate and effective in delivering information that people need to know for their own decisionmaking. It is less well-geared, in the Rhode Island communities at least, to encouraging discussion of communitywide issues where the appropriate answer, method, or solution cannot be provided by the district community development staff.

Deriving Rural Policy

The discussion following the presentations centered around issues of future town development as stimulated by a combination of inputs from interests that at times stood strongly opposite in point of view. The sessions produced a sharing of concerns that did not normally occur at meetings of local planning boards and town councils. The library setting provided a neutral, intellectually sound environnment for discussion. Although points of view cannot be expected to have changed radically as a result of the meetings, they did produce a conversation that ranged across the interests of the town. And they involved political officials who had a major stake in solving communitywide growth problems stemming from the town's location adjacent to the metropolitan area.

There is a sense that exploring points of view outside the political context enhanced the town's ability to face planning for future development and to resolve some of the difficult issues that had divided persons favoring growth from those favoring no growth.

Libraries in Cooperative Extension

Libraries can provide important services in association with Cooperative Extension. Too often libraries are thought of primarily as repositories of books. However, in Rhode Island and many other states, program development is a major part of the librarians responsibility. CES and library goals can be furthered by joint programing. This linkage benefit is particularly true in the community development area, where there is a desire to involve the local political system.

Land development policy in rural Rhode Island continues to be an important issue. Further research is being conducted by the University of Rhode Island, Community Planning Curriculum, on the problems of rural subdivision and improving local control over residential development.

This work, along with the previous study of growth dynamics and growth center policies, may also be introduced to the communities through joint CES-library forums. □

Testing for Home Flood Protection

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It's the age-old story of Extension workers dipping into their own pockets for program materials and testing them before public usage—only on a grander scale.

That's how Ray McManus and Gene Baker of the Louisiana Cooperative Extension Service's agricultural engineering staff viewed protection of the McManus home from floodwater, which inundated the southeastern part of the state earlier this year.

Based on a scattering of methods tried around Louisiana by other flood victims in the past, the two combined their engineering know-how to devise a low-cost protection system around the McManus home, which sits on the edge of the Amite River flood plain near the city of Denham Springs.

A Prove-It-Yourself Project
For less than $1,000 their prove-it-yourself project left some areas of the home dry and other spots with no more than 1 inch of seepage, while the muddy high-water mark on the outside of Ray's 3,000-square foot brick veneer structure reached nearly 3 feet.

This was quite a saving from the $25,000 in damages which occurred when 18 inches of water poured through his home in a 1977 flood, McManus recalls. Six years ago, the home had extensive damage to walls, electrical circuitry, and other fixtures; and almost total loss of furniture, carpets, clothes, major household appliances, and the central air conditioner compressor.

"The key to our success this time was preparedness," McManus says. "I bought all the materials we'd need and had them ready when the water began to rise."

Delayed Wrapping Party
At that, the pre-planning almost didn't work. They were to prepare the area around the house one night and "wrap" it in polyethlyene plastic the next morning. However, a sudden surge in the tide forced McManus and Baker to move their wrapping party to midnight. Some seepage which soaked carpeting was blamed on the haste with which they had to erect the protective shield in the darkness.

At the heart of the flood-proofing plan were the plastic, a couple of 3-horsepower gasoline-powered sump pumps, and a dozen or so sheets of 1/2 inch exterior plywood.

First, the engineers and their helpers dug a 6-inch-deep trench around the outer walls of the house. Three 100-foot rolls of 8-foot-wide, 6-mil polyethylene plastic were buried on the bottom edge in the trench and weighted with sandbags. The plastic was extended up the walls 4 feet and fastened with masonry nails.

In open areas of the porch and carport, where there was no wall support, 4 x 8-foot plywood, reinforced with 2 x 4 foot stud framing, held the top edge of the plastic film. Ends of the rolls were overlapped by 10 feet to ensure an adequate seal. Sandbags held the plastic in place across the concrete driveway.

Testing Theories
The theory on which the pair banked their plans was that the higher the water rose, the more pressure its weight would exert on the plastic, hence, the better the water-tight seal.

The second crucial factor was the sump pump placed on the carport. Since carport, porch, and patio concrete is laid lower than the house slab to keep driving rain out of the living areas, these lower levels make ideal sumps. Of course, the pump must discharge seepage water over the protective barrier faster than it can enter to keep the home flood free.

When the floods came they were ready! Extension agricultural engineering specialists Ray McManus (left) and Gene Baker check out the gasoline-driven sump pump that operated from behind a water-tight barrier and kept rising floodwaters to a minimum.

"There was no way to keep all of the water out, but staying ahead of it with the pump, which ran continuously for 48 hours during the height of the flood, minimized the damage. We weren't prepared for water which backed up through the commodes. We removed the toilets and stuffed rags into the drain pipes. That's where most of the water goes into the house," Baker points out.

New Solutions
"We learned from that experience and will be better prepared when and if we have to do it again," Baker says.

At around $300, the gasoline pump capable of removing 50 to 100

Three 100-foot rolls of polyethylene plastic sheeting wrapped the McManus home against floods that ravaged southeast Louisiana earlier this year.

gallons of water a minute was the most expensive item on the materials list. McManus also boxed and wrapped his air conditioner compressor, which rested on a ground-level concrete slab outside the house. He used the second pump in an attempt to keep it dry, but the pump failed and the compressor was inundated and lost. Based on experience in the two floods, he believes the solution might lie in mounting the compressor on a 3- to 4-foot platform.

Preparations also included storing 10- to -12 gallons of gasoline for use in the self-priming centrifugal engine that pumped intermittently without overheating. "Any gasoline engine," Baker cautions, "should be operated in a well ventilated areas.

He believes the same principles can be applied to "wrapping" a wood-frame house on piers by using the reinforced plywood to cover the gaps between the columns. "It might not be wise", Baker says, "to try protecting either type house if the water level rises to 4 feet or more because weight of the water could cause structural damage or collapse."

Nominal Costs for Fresh Findings

"What we did at Ray's was no panacea. Our plan needs refinement, but for short-term protection against moderate levels of flooding we think it sure beats doing nothing," Baker concludes. "Considering the extent of damage that can result from a couple of feet of water in a house, the cost of materials is nominal, and most of materials are reusable."

As a result of their success this spring, McManus and Baker have been sought as speakers by community groups and concerned individuals in the flood-prone areas of north and south Louisiana. They have also published a bulletin outlining their protection plan. □

The polyethylene plastic sheeting around the McManus home was attached to the outside walls with masonry nails.

Planning for Energy Conservation

Stanford M. Lembeck
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The Pennsylvania State University

Extension community planners in Pennsylvania are beginning to adopt an energy-conserving perspective in their land use planning activities. Land use decisions are a major factor in the siting of homes and other buildings, on street design and layout, and on the closeness—or separation—of various activities within the locality. All of these have important energy using implications.

Take an ordinary single-family home, for example. Careful siting of a house can maximize "solar gain" in the winter, while reducing cooling needs during hot weather. In most instances a home sited with its long dimension across the front of the lot, on an east-west oriented street, provides the optimum solar orientation. Since about 70 cents of every energy dollar is spent for space heating and cooling, careful attention to siting and street layout can pay handsome dividends.

With the help of Extension planning specialists, community development agents, local planning commissioners, building contractors, and citizens are learning how to incorporate energy conservation thinking into local land use policies and regulations.

Target: Local Planning Commissions
The primary audience Pennyslvania Extension wanted to reach were the local planning commissions since they work most directly with persons interested in developing property. Knowing that few Pennsylvania communities had the motivation or money to undertake a full-scale energy planning effort, Extension planners decided on a strategy of intoducing an energy perspective into existing community plans and regulations. Although an admittedly piecemeal approach, it was chosen because of the greater likelihood these new ideas would actually be used if tied to what our target groups knew best—their existing planning policies and procedures.

Awareness of Solar Principles
First, we wanted to introduce planners to an "energy perspective" which they could use without having to make changes in existing land use policies or ordinances. For example, local planning commissions would continue to review subdivision site plans under existing standards, but they would be encouraged to look at plans with a new understanding of southerly orientation of buildings, proper use of south slopes, areas having poor solar access because of natural and man-made obstructions. Awareness of solar principles would be added to existing standards as a developer's lot and street proposal was being reviewed by the commissions.

Key Concepts
It was a simple matter to insert energy considerations into Pennsylvania Extension's ongoing planning workshops for local officials and planners. A new audience of small builders and developers was also cultivated and introduced to these ideas as well. Several key concepts were stressed as basic land use planning considerations for these audiences:

- The sun's path is fixed and known; this information should be the starting point for lot and street design.

- South orientation is the key design consideration. South slopes are optimum building sites because they receive solar rays more directly; buildings cast shorter shadows on south slopes. This permits taller buildings and higher densities. Less desirable north-facing slopes can be kept open.

- The area between the sun and the solar user must be unobstructed and unshaded now, and in the future.

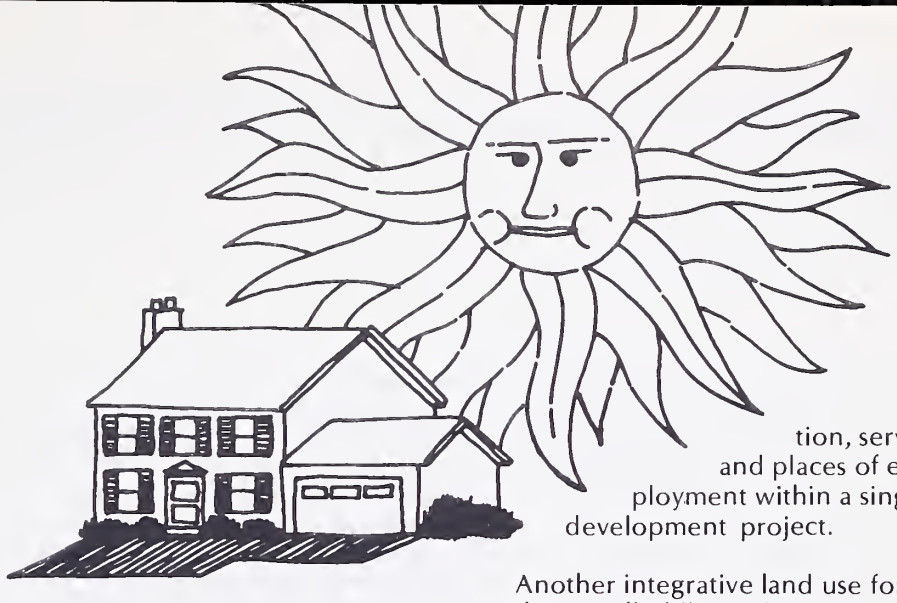
By pointing out that east-west streets usually maximize the southerly orientation of houses, workshop participants were able to calculate on sample subdivision maps the amount of north-south streets and the suboptimally oriented building sites they create.

The next step in the strategy was to have local planning agencies modify some of their existing requirements by adopting new energy sensitive standards. Even greater energy conservation payoffs can result when current policies are revised to achieve specific energy goals.

Streets Broad and Narrow
Streets, for example, are major development investments which have long-term energy conservation implications. Wide streets require more energy to build. Narrower streets reduce the initial energy input (petroleum for paving material and construction equipment) and future maintenance costs as well.

Moving to the second level of revising standards involves a much greater planning effort. This was used in the workshops to teach basic planning skills of analysis, evaluation, and communication to local planners and citizens—while they are learning about energy conservation.

Most important to point out is that every community is different, and that land use revisions should be targeted to specific needs. In some towns the major problem is *infilling*—using individual vacant sites in an energy-efficient way within already built-up areas. Rural and rapidly growing areas need energy-conscious standards for their major problem—*new development*. In other towns, modifications in



ordinances and policies are needed to make energy *retrofitting* of existing structures easier.

Solar Easements
Penbrook Borough, a small town of 3,000 people near Harrisburg, is a good example of sound planning that was done before the local ordinances were revised. The planning commission knew that Penbrook was 95 percent built-up, that one-third of the population was over 55 years of age—with many living on fixed incomes, and that it had a housing stock where three out of four homes were built before 1940. Based on this knowledge the commission prepared revised standards for retrofitting existing homes. Included in the retrofitting standards were guidelines for windmill heights, noise levels, and anchoring to protect the rights of neighboring property owners. The solar easements were needed to ensure that new structures built on vacant sites would not obstruct solar access on existing homes and buildings.

Workshop participants are encouraged to think about the predominant land use patterns, resources, and people in their towns in ways that will focus on opportunities and limitations for energy conservation. For example, they are asked to characterize basic growth and development factors:

- Is the pattern of development compact or spread out?
- Are development densities generally low, medium or high?
- Is the town in a period of fast, slow, or no growth, or is it declining?
- Can the stage of the community's life be characterized as young, mature, or old?
- Is the community usually open to new ideas and innovations, or is it more traditional in outlook?
- What is the age structure of the population, and do people have money, skills, or time to devote to energy conservation activities?
- What is the age, size, and condition of the housing stock?
- Are land uses—homes, stores, employment, recreation—in close proximity, or separated from each other?
- Which public services, such as recreation, water and sewer service, and public transit—are available?

Community Overview
With an overview of the community, it's possible to begin asking critical planning questions. For example, in a mature, slow growing community, would increased residential densities be a feasible way of creating a compact, energy-efficient development pattern? The answer would come from an understanding of the capacity of existing roads, the size and occupancy pattern of existing homes which might be converted to multiple occupancy, and the availability of public facilities to support a more concentrated population.

The third, and most difficult, step in the Extension strategy is encouraging the acceptance of newer forms of development. New and innovative development approaches have the potential to go beyond conservation and *reduce* future energy needs.

One approach to achieve this is through the integration of land uses. In developing areas, *planned unit development* is a technique to integrate homes, shopping, recreation, services, and places of employment within a single development project.

Another integrative land use form is the so-called "*mixed use structure,*" which is the intown version of planned unit development. Within a single structure, apartments, condominiums, offices, shops—and sometimes recreational facilities—are found under one roof.

Modified Ordinances
In the past many zoning ordinances attempted to separate what were considered to be competing land uses—homes, offices, stores, workplaces. Today ordinances are being modified to allow *mixed used districts*, zones in which a variety of different land uses can be located close to each other.

Implementing Conservation Plans
It's important for local planners and officials to become comfortable with this new energy perspective on land use planning before moving on to more complex planning applications. That's why it is important to incorporate energy awareness into the usual and familiar planning commission tasks.

Revising land use standards and development standards is far more complex. Our workshops attempt to anticipate community reactions and help participants prepare a strategy for overcoming resistance.
The serious energy crisis of a few years ago forced us to examine the impact of local policies on energy use, and to seek new land use techniques. Extension community planning programs are exposing local planners, elected officials, and developers to energy sensitive land use planning that will continue to pay big energy dividends year after year. □

Farmland Retention in the Empire State

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Agriculture is an important industry in New York State. New York State is more than the "Big Apple"—about one-third of its 30.6 million acres are still devoted to farming.

"Farming enterprises produce nearly 3 billion dollars worth of products and contribute significantly to state employment in the associated businesses that provide goods and services to agriculture," says David L. Call, dean of the New York State College of Agriculture and Life Sciences at Cornell University.

People in the "Empire State" are increasingly aware of the need to fashion harmonious arrangements between the city and country and ensure that farmers have access to the land resources needed to sustain agriculture in the future. The New York Cooperative Extension plays a significant role in helping the citizens of the state understand the issues through educational programs that enable them to more effectively participate in the land use decisionmaking process at all levels of government.

Background
In New York, migration from rural communities, combined with changing cost-price relationships for farm commodities saw nearly 12 million acres of farmland retired over the 1900 - 1970 period, much of which was in the early stages of forest succession. However, during the 1950's, population growth in larger incorporated cities slowed dramatically and rural population experienced new growth. This population trend helped precipitate changes in attitudes about landownership and created an accelerating public dialogue about the future vitality of New York's agriculture.

Time for Action
An awareness of the dramatic impacts that shifts in population and land uses were having on agriculture resulted in a number of legislative and executive initiatives by state leaders. On the legislative front, among the initiatives was the passage of a law to enable local municipalities to obtain fee (full) or lessor interests in land for the purpose of maintaining open spaces. This law has proved to be the basis for a number of innovative efforts by local governments to foster arrangements for retaining farmland in its current use. Suffolk County pioneered a program for the acquisition of development rights to farmland.

This drew nationwide attention during the 1970's. This law also provides local government with the option of negotiating an easement with private landowners for specified periods of time to maintain land in farm use. Such a program is now in operation in the town of Perinton, Monroe County, New York.

On the executive front, the Governor appointed in 1966 a State Temporary Commission on the Preservation of Agricultural Land. The subsequent Commission report outlined a series of recommendations to help agriculture remain viable in the "Empire State" including the designation of prime agricultural districts within the state. After extensive deliberations and the passage of an amendment to the state constitution directing the legislature to protect agricultural lands as part of a state policy, an 1971 state law authorized the creation of agricultural districts in New York.

Benefits of Districts
New York's Agricultural District Law specifies at least five benefits to be derived by landowners:

- Qualified landowners may apply for an agricultural value assessment of their land.

- Local governments are limited in enacting ordinances that restrict or regulate farm structures or farming practices.

- State agencies must modify administrative regulations and procedures to encourage the maintenance of farming insofar as it is consistent with the promotion of health and safety.

- Public agencies are required to demonstrate that they have considered alternatives before acquiring land by eminent domain or before advancing funds for nonfarm development in agricultural districts.

- The power to tax farmland for nonfarm services in agricultural districts is restricted.

Cooperative Extension Involvement
"The passage of the Agricultural District Law provided an unusual educational opportunity for Cooperative Extension agents in most New York counties," says David T. Smith, associate director of New York Cooperative Extension. "The process brought those interested in agriculture together and focused new attention on agricultural resources. Cooperative Extension used this opportunity to demonstrate the effectiveness of a well-planned and executed educational program."

Smith continues, "Agents were instrumental in helping to organize agricultural district advisory committees, which were responsible for reviewing agricultural districts. Close working relationships developed between Cooperative Extension agents, county planners, and county legislators as farmers, farm organi-

zation leaders, and others became involved in the formation of districts."

The educational program conducted by Cooperative Extension staff together with state agency representatives and local officials resulted in leadership development of both the farm and nonfarm communities that were interested in preserving farmland. This sharing of interests and concerns developed mutual respect between both groups. Local officials became sensitized to the needs of farmers and supported the creation of agricultural districts. State legislators as well as farm leaders monitored the workings of the law and "fine tuned" it to effectively serve the needs of agriculture.

Accomplishments

Today, more than 11 years since the Agricultural District Law became effective, New York has 456 separate districts in 49 counties of the state. Over 6.7 million acres were originally included in these districts, which range in size from 535 acres to over 243,000 acres and average about 14,800 acres. While these statistics are important in and of themselves they tell only a small part of the story about what agricultural districts have meant to the farmers in New York.

More important than the number of districts and the acres involved are the people who have participated in the decisionmaking process in the creation of districts. New leadership emerged across the state as district proposals developed at the local level. Cooperative Extension's educational programs enabled local citizens to understand the law and the process for creating districts. And the people responded by taking the initiative and exercising their leadership in carrying the process to a positive conclusion.

The net effect of the 8-year review process was an additional gain of over 589,000 acres to the land in agricultural districts. So that after 11½ years, over 7.3 million acres are included in agricultural districts in New York State.

Henry Stebbins, the administrator of the Agricultural District Program for the New York State Department of Agriculture and Markets summarized Cooperative Extension's role in the agricultural district program in these words: "The record shows that counties with a strong districts program are counties with a strong Extension commitment to program objectives. Districting relies upon an effective educational support system which Extension has provided. The participation and leadership of farmers is vital to the success and continuity of the program."

Looking Ahead

New York remains very complex from an economic, social, and political point of view. With sharp contrasts in urban, suburban, and rural development in the state, it is not surprising that New York has evolved not one, but a number of alternative approaches to farmland retention.

Agricultural districts are clearly the most visible manifestation of public concern over farmland use in New York. Yet, land use policies for the state are also dynamic. Continued experimentation with purchase of development rights, transfers of development rights, contractual easements between towns and landowners, tax incentives between taxing jurisdictions and landowners, and finally, the combination of agricultural districts with these approaches and traditional zoning are on the horizon for farmland retention in the "Empire State."

Cooperative Extension will continue to provide the educational programs to enable citizens to participate fully in public policy issues regarding the allocation of land for continued use in commercial agriculture. □

Protecting Prime Farmland

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Indiana's prime farmland resources are considerable. Despite its small size, Indiana contributes heavily to the Nation's food supply and provides products for support. Such achievement is possible not only because of skilled management by Indiana farmers, but also because of the tremendous potential of its soil resources.

Prime Farmland Resources
Prime farmland includes soils that are available and best suited to crop production. These are soils that retain enough moisture, are fertile, and are adequately drained for maximum production. They are not frequently flooded or subject to severe erosion.

Of Indiana's 15 million acres of farmland and 13 million acres of cropland, 11.5 million acres are considered prime farmland. About 2.5 million more acres are in pasture or forest. This land, highly productive, meets and exceeds fundamental criteria for prime farmland. It has excellent water-holding capacity, generally good natural fertility, and favorable climate.

Indiana's rural land is fast being converted to urban uses, as shown by studies of land use by USDA's Soil Conservation Service (SCS).From 1960 to 1970, approximately 35,000 acres per year of rural land were converted to urban uses. From 1970 to 1980, 85,000 acres were converted annually.

Maps and Publications
Indiana Extension staff have been looking at the issue of conversion of rural lands to urban uses, occurring statewide. Information has been provided to rural and urban groups as to extent and location of prime farmland and issues posed by its loss. SCS and soil scientists in the Purdue university Agronomy Department have prepared a state map showing prime farmland distribution in Indiana. SCS has prepared individual county maps of prime farmland. Two Extension publications that focus on this issue are: "Protecting Prime Farmland in Indiana" and "Farmland Protection Techniques." These publications and the maps have been used by local groups to study prime farmland protection.

What Has Been Done
Indiana, like 45 other states, assesses farmland for taxation at its agricultural value rather than development value. While this method reduces the tax burden of farmers in developing areas, it has not proved to be an effective method of protecting agricultural land.

Zoning is the only method of protecting prime farmland for which there is enabling legislation in Indiana. In the past, the agricultural zoning classification has been considered a temporary category that could be easily changed to a "higher" developed status. This attitude may be changing; about 70 of the state's 92 counties have some type of plan for zoning new developments.

Several counties have adopted zoning ordinances that strengthen the commitment to agricultural zoning, where agriculture is the permitted land use and other uses are restricted. These ordinances were generally developed and adopted after a careful study by concerned local groups of rural and urban citizens. Their development locally means that each ordinance reflects specific thoughts of the community. Critical to the success of these efforts was the information supplied by SCS, professional planners, and local and university Extension workers. Much of the material used had been gathered previously in the hope that the "teachable moment" would occur.

Several counties in Indiana are using land evaluation systems to determine the quality of land for various uses including agriculture. These studies are vital to consistent development of zoning boundaries. The commonly used systems are the SCS, LESA (Land Evaluation-Site Assessment) system, and the Purdue University Subdivision Impact Model. These approach the problem from opposite points of view, but usually arrive at a similar answer.

The LESA system evaluates the quality of the soils and evaluates the site as a location for agriculture or urban development. Some planning commissions have developed their own system of land evaluation using similar criteria. The Subdivision Impact Model is available in each county Extension office through the Purdue University FACTS (Fast Agricultural Computer Terminal System).

Farmland Protection in Indiana
To date prime farmland protection efforts have occurred mainly at the county level based on currently available methods. At the state level, a Legislative Study Committee of the General Assembly has studied several legislative alternatives. A "Right-to-Farm" law was passed in the 1982 session of the assembly. It provides protection for farms from nuisance suits brought by urban neighbors. A farming operation, not a nuisance at the outset, cannot now be a nuisance, if it has not changed greatly.

In Extension work in Indiana, information is presented on farmland protection in a variety of ways so that a reasonable course of action can be selected. □

Land Use Planning—Hoosier Style

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Indiana Extension agents wear two hats when they work on land use planning. They are educators and advisors and they serve as decision-makers on countywide planning commissions.

Mixed Blessings
Being educator and policymaker can be a mixed blessing. Agents may find themselves embroiled in controversies ranging from landfill locations to mobile home regulations. Occasionally, a planning commission lapses into "dormancy", a victim of apathy, or it is blocked from effective action by local officials as they respond to complaints of unhappy citizens or special interests.

Products of the planning process are increasingly more comprehensive and sophisticated. Many counties are focusing on farmland protection techniques and policies to contain urban sprawl.

Planning That Worked
St. Joseph County, Indiana illustrates a planning program that has culminated in effective land use policies. A coalition of farm interests and county officials took shape, spearheaded by efforts of the Area Plan Commission, the Cooperative Extension Service, and the Soil Conservation Service.

In 1978 a group of organizational leaders, called the "Agricultural Advisory Committee," started studying the issues and obtained further input from constituents. The ad hoc group came to a consensus on the problem:

- Scattered residential development was wasting valuable farmland, causing conflicts with farmers and boosting costs of extending public services. Urban sprawl was the enemy!

- The county was "overzoned" for industrial and residential uses.

Proposed Solution
County planners and citizen leadership went to work during 1978–79 to delineate an exclusive "agricultural district," where farming would be encouraged and protected from urban growth.

In the resulting proposal, 100 square miles were reclassified from "rural–residential" to "exclusive agriculture" located west and south of South Bend. Thirty-two square miles of unincorporated rural land closer to the metropolitan area would be for rural nonfarm residences, with agriculture as a permitted, but not protected, use. In the new proposed agricultural zone, no new residential subdivisions would be allowed.

Single-family residences were to be on large lots—measures designed to discourage most nonfarm development.

In 1979 and 1980, after dozens of educational meetings and public hearings, county and city officials approved revised ordinances unanimously.

A Potential Success Story
Hendricks County lies straight west of Indianapolis in the heartland of the Cornbelt and in the path of urbanization. Population has tripled since 1950, with most of the growth on the east side close to Indianapolis. A Purdue University study on urbanization found farmers complaining about higher taxes, less land available for farming, pressure to reduce livestock, plus competition and conflict with new nonfarm neighbors.

An informal coalition of the county planning agency and Extension leadership began a comprehensive planning process utilizing a number of volunteer citizen committees. The planning program, extended over several months, has produced a general land use and development plan for the county.

A "Temporary Setback"
Bartholomew County, in south-central Indiana, includes the unique city of Columbus, where many architectural innovations have been championed by progressive industrial and business leaders.

Planners and the local Extension agent teamed up to work with a small group of rural leaders to draft plans and ordinances for unincorporated areas. The intent was to protect the more productive farming areas from urban development and to improve the quality of the rural environment. Controversy erupted and advertisements attacking planners and proposed plans appeared regularly in the local newspaper. County officials first vowed to pass the necessary land use controls to implement plans, then later changed their minds.

The highly qualified planning director left for other employment in a southern state. The rest of the plan proponents are now showing a "lower profile" but hope to salvage some of the recommendations they have made.

These three examples typify what goes on in the 70 or more counties where planners, Extension agents, citizen leaders, and local officials attempt to hammer out appropriate land use policies. Policies have considerable impact on property values and future growth, but they are achieved only when the majority of concerned citizens are involved and supportive of the new proposals. To the Cooperative Extension Service involved in the planning process, the effort presents a real challenge. And it is no place for the fainthearted. □

Built-In Erosion Control

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Farmers' intensive agricultural use of farmland in Kentucky means most of them must protect their land from erosion. About three-fourths of the state's agricultural land base slopes enough to present a potential erosion hazard. Implications of this hazard became apparent during the seventies as cropland acreage of corn and soybeans nearly doubled from that of the Sixties. Although Kentucky's land base could support production of 2 million more acres of row crops than in use in 1980, some of the expansion of corn and soybean acreage took place in areas unsuitable for their continuous production.

UK Agronomists Develop System
To find a way to alleviate this situation, University of Kentucky agronomists devised a cropping system to test intensive grain production on sloping land, with adequate erosion protection. This system is a corn-soybean rotation in which small grain is seeded for winter cover, double-cropping and no-till planting are used, and strip cropping occurs in relative narrow bands.

The system was field tested in western Kentucky on a 6 to 12 percent sloping soil for 4 years. Corn and soybeans were grown in alternate parallel strips, generally on slope contour. After harvesting corn and soybeans, the field staff disked and seeded the land to wheat. The following spring, corn was planted without tilling into the strip which had produced soybeans the previous year (wheat in this strip was killed in the no-till planting procedure to provide a mulch cover for the corn). Wheat growing in the strip which had produced corn the previous year was allowed to mature for harvest. Immediately following the combining, soybeans were planted without tilling into wheat stubble. Relatively narrow strips (20 to 50 feet wide) are an important part of the scheme.

After the second harvest, the field was disked and planted to wheat. The process of the first year was repeated, except that corn was rotated in place of the previous year's soybean strip, and soybeans were rotated onto the previous year's corn strip. A resulting 1.5 acres of grain are produced from each acre in the system if double-cropped soybeans are grown (0.5 acre of corn, 0.5 acre of wheat or barley, and 0.5 acre of soybeans). Grain sorghum could be used instead of double-cropped soybeans in some areas. If soybeans are not double-cropped, each acre produces 0.5 acre of corn and 0.5 acre of full-season soybeans.

Good Yield, Little Erosion
Results from this test, repeated in four strips, exceeded yield expectations. Just as important, erosion was negligible.

Wheat yields, obtained only in 1978, ranged from 30 to 34 bushels per acre; wheat stands from falls 1978 and 1979 seeding were not sufficient to justify grain harvest in 1979 and 1980. Wheat yields from an adjacent field ranged from 35 to 50 bushels per acre during this time.

There remained the question of what erosion control could result from use of this system. There were no tests held of continuous soybeans or continuous corn, with and without seeding a winter cover crop because we were using a farmer's field and did not want to risk serious erosion losses. So there were no check plots against which to compare for erosion control. No appreciable erosion was observed on the strips during the 4-year period. The system was tested severely in the winter and spring of 1978-79; 80 inches of rain fell between December 1, 1978 and December 1, 1979. Despite lack of good cover from the wheat, essentially no sheet erosion occurred on strips which had been in corn. Slight sheet erosion took place on strips which had been in soybeans, but the erosion stopped as it reached the adjacent downhill strip which had been in corn. The odds of rainfall amounts such as those that occurred are about 1 in 100. The system offers adequate erosion protection to justify its use in intensifying grain production from sloping land.

Wide Strips Effective
Although not studying the effect of strip width, it was determined that strips over 50 feet wide would allow overwinter runoff of water from soybean strips to build up enough speed to create erosion problems, particularly on steeper slopes. Strip widths should be of some multiple of a planter width, up to 50 feet. Strips of 20 to 25 feet would enable one round per strip of 4-row equipment, or one pass through each strip of 8-row equipment.

This field study shows, then, that the system could provide good erosion control as the field would not be cultivated except for a fall disking, and both corn and soybeans would be planted without tilling. The weak link was in obtaining enough fall growth of wheat for good overwinter cover. With normal fall weather in our latitude, farmers usually can complete soybean harvest by mid to late October, and they can seed wheat immediately thereafter. Abnormally cold weather, which can occur by early November, could prevent wheat from providing adequate cover.

Left: A planting of loblolly and shortleaf pine stabilizes a stripmine in Hazard, Kentucky.

Below: The vari-tiller and no-till planter at work in Kentucky. Extension agronomists at the University of Kentucky have devised a cropping system involving a corn-soybean rotation for sloping land that has adequate protection against erosion.

Corn grown in narrow strips provides some advantage, as leaf and stalk diseases occurred less and lodging was less. Also, the differential heating produced by the alternating height of corn and soybeans might cause more desirable air flow patterns than is typical in separate fields of corn and soybeans.

The system permits better sunlight, and water, soil, and air management for maximum crop production and minimum erosion. The approach provides the farmer with a strong economic incentive to carry out good soil conservation practices. It should be especially helpful in meeting requirements of the Water Pollution Control Act for nonpoint source pollution.

Spreading the Practice

After the field study, Extension staff held a field day at the site to discuss results with farmers, Extension agricultural agents, and Soil Conservation Service personnel. Based on the high interest shown, we initiated a farm demonstration program to highlight use of these and other agronomic practices in maximizing grain production while controlling erosion. State Extension soils specialists are providing leadership for the program.

Support for the program also comes from the Tennessee Valley Authority, TVA), U.S. Department of Agriculture's Agricultural Stabilization and Conservation Service (ASCS) and the Soil Conservation Service (SCS). TVA agreed to provide a fertilizer discount; ASCS agreed to cost share for recommended practices; and SCS agreed to provide technical help in laying out strips, grass waterways, and so on.

Four Counties to Test Program

A State committee, led by Extension and including representatives from the state ASCS and SCS offices and from TVA, was established to coordinate the program and identify locations for establishing the demonstration farms. Four counties were identified—one in each of the four Extension areas where grain production is most intensive and erosion problems are common. A local selection committee, led by the Extension agricultural agent and including the local ASCS office manager, local SCS district conservationist, and a representative from the county Extension council and the Soil and Water Conservation District, was organized. It was asked to identify and recommend a farm for the program which had land characteristics similar to the surrounding areas, and on which cash grain was the dominant farm enterprise.

The four farms selected were planned for intensive grain production, with emphasis on use of agronomic practices for erosion control. Engineering practices were recommended only where no appropriate agronomic practice was available. Farms were enrolled for 4 years, during which time detailed financial records will be kept so the economics of the cropping system installed can be evaluated. All recommended systems are to be in full use on each farm by the end of 4 years. The farms are to be used as a focal point of educational activities within the areas to demonstrate agronomic solutions to erosion problems faced by cash grain producers.

To coincide with this program, Extension soils specialists have prepared seven publications on aspects of agronomic solutions for erosion problems. These publications will be distributed during the fall and winter of 1983. Additionally, much emphasis on this program will be given in routine Extension use of the news media.

It is too soon to determine any program effect. But farmers' interest in it and their concerns about erosion and impacts on cash grain production are high enough to make us enthusiastic about potential results of the new program. □

Solving Land Use Problems

Gerald A. Miller
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Iowa State University

Land use is not a new issue. Most large cities and many towns have had land use plans and an array of ordinances to implement these plans for many years. Most rural areas, however, have not developed such plans. For those that have, actions usually concentrate on some form of zoning which does not reflect any comprehensive land use plan as a guide. Effective land use requires development of a comprehensive plan, one that can be implemented by planning tools, such as zoning and other local ordinances.

Issue: Farmland Conversion
Since the late forties, the dominant land use issue in rural America has been that of farmland conversion to irreversible nonfarm uses. Related concerns include strip development, adequate public services, upgrading of roads, impact on local school districts, disruption of traditional community ties, and changing of the tax base, and distribution of the tax burden.

During the seventies, reversal of the historical trend of net population migration to the cities added another dimension to the farmland conversion issue. Single-family structures housing nonfarm families are commonplace in many rural areas.

Also, during the seventies, society developed an appreciation for the quality of agricultural land that was being converted to nonfarm uses. Americans became concerned about the conversion of highly productive cropland and specialty-crop lands. Much rhetoric resulted about the cropland crisis that may occur in the future.

Three other major concerns receiving attention are the following:

- Loss of the natural soil fertility and potential productivity on croplands because of accelerated erosion and inadequate management.
- Conversion of marginal lands to croplands.
- Increasing size of the average farm used for crop production.

Why have these topics become issues and what are the facts?

Farmland conversion is a major issue in areas adjacent to large metropolitan areas in the northeastern states, the Middle Atlantic states, Florida, areas adjacent to the Great Lakes, and the southern part of California. The issue is especially important in areas where small acreages of high-quality cropland occur or where speciality crops, dependent on a unique combination of climate and soils, are produced.

Migration of nonfarm people to rural America during the seventies is illustrated by analysis of census data by Willis Goudy, sociologist at Iowa State University. Between 1970 and 1980, the rural farm population in Iowa decreased from 419,700 to 391,000. But during the same period, the rural-nonfarm population in Iowa rose from 786,200 to 814,800.

Reducing Soil Losses
Soil erosion and the failure to implement known soil-conserving measures on productive cropland have become a national issue. Maintaining soil losses at levels that approximate soil renewal rates on productive cropland has become the focal point of this issue. A U.S. Department of Agriculture Soil Conservation Service inventory in 1977 shows that 24 states have average annual sheet and rill erosion rates on cultivated cropland of over 5 tons per acre per year. Five tons per acre per year is considered the maximum soil loss tolerable for many soils. Some soils have a maximum limit of 2, 3, or 4 tons per acre per year.

Five states, Hawaii, Iowa, Mississippi, Missouri, and Tennessee, have average sheet and rill erosion rates exceeding 10 tons per acre per year on cultivated cropland. Iowa, with nearly 25.5 million acres of cultivated cropland, leads in soil loss—259 million tons a year.

The soil erosion issue involves loss of topsoil and nutrients, reduction of water infiltration capacity, introduction of subsoil material in the tilled layer, increased runoff on sloping lands, and the introduction of excess sediment and associated chemicals into surface waters. Some of these questions are: who pays for the offsite costs in the short-term? How will future generations react to their predecessors' abuse of the soil that may result in loss of long-term soil productivity?

Recommended Practices
It is possible to maintain soil erosion at tolerable rates. Some methods include soil conservation structures such as terraces, diversions, and grass waterways, and soil conservation practices such as conservation tillage, sod-based rotations, contouring, and stripcropping. Farmers do not use many of these practices, however. They require a major immediate investment, but returns, in the sense of preventing yield losses, often lie in the distant future.

Yet, changes are occurring. We are in the middle of a 20- to 25-year tillage evolution cycle. Iowa farmers are moving away from moldboard-plowed, clean-tilled fields, to some form of reduced tillage.

Much remains to be accomplished before farmers achieve maximum benefits from reduced tillage.

Using Marginal Lands
Converting marginal lands to cropland is a relatively new land use issue. It involves farming on relatively

unproductive, fragile soils. Marginal lands include steeply sloping soils, soils with low inherent fertility, soils with low water capacity available to plants, and soils shallow to rock, gravels, and boulders. Marginal lands may be used on woodlands, permanent pastures, sparsely vegetated rangelands, and wetlands before conversion to cropland.

Many people believe that property owners have the right to acquire land and property, and also the right to use, protect, and perhaps abuse the land. Often a landowner's goal is short-term gain at the expense of the soil and of society. Windfall profits can be reaped by converting use of marginal lands to that of intensively managed croplands. High yields may be obtained for 1 or 2 years before the thin veneer of topsoil is completely gone, salts accumulate in the soil profile, water tables are lowered and perhaps depleted, or the small reservoir of natural fertility is reduced by leaching and erosion.

A Visible Issue

Many soil conservation and land use groups during the past 5 years have come to believe that conversion of marginal lands to cropland should be halted. The issue is highly visible in the western Corn Belt and in the Great Plains area. Diverse soil conservation and environmental groups support the "sod-buster" legislation introduced in the U.S. Congress.

The 1972 Soviet grain deal, subsequent record-high corn and soybean prices, and the Federal government's encouragement of farmers to plant fence row to fence row influenced a 30-percent increase in row crop acreage in Iowa over 9 years. Many of the additional 5.22 million acres of row crop came from areas that had been in woodland, permanent pasture, and rotational pasture, and from the draining of wetlands.

In many fields, farmers had to build terraces to maintain soil losses at a reasonable level. However, subsequent soil losses often exceeded tolerable limits. Some currently terraced lands include soils with a low productivity potential.

Economies of Scale

Increase in farm size is a land use issue that relates to the family farm. Many people view the family farm as the mainstay of rural America. The concepts of community stability, quality of life, and ethics, morality, and structure of a community relate to the family farm.

Farm size can be measured in several ways. The most common method is the associated acreage. This measure may not reveal intensive livestock feeding operations and specialty crop production as it does with grain farms. So, gross annual sales can give a fuller picture when looking at scale.

The 1978 Census of Agriculture counted nearly 2.5 million farms in the United States. Over 25 percent were less than 49 acres and more than 4 percent were 1,000 to 2,000 acres. These size classes showed the only increases from the 1974 census. Farms selling more than $40,000 a year nearly tripled between 1969 and 1978, from 222,000 to 589,000. The number of farms with annual sales less than $40,000 fell from 2.5 million to 1.9 million.

Cost of Production

In the Corn Belt, the economic principle associated with farm size is one of the economies of scale. Cost of production per bushel of grain harvested can be decreased as the size of farm increases up to 600 acres. Such cost does not go up for units greater than 600 acres, nor does it decrease, Thus, farmers are motivated to increase their size of operation so they can take advantage of economy of scale. In Iowa, average farm size rose from 190 acres in 1960 to 286 acres in 1981, while the number of farms fell from 183,000 to 118,000.

The size of farm issue and the increasing use of conservation tillage provide a "Catch-22" dilemma. A major benefit of reduced tillage is the time the farmer saves. Research conducted in Iowa by T. S. Colvin, C. A. Hamlett, and A. Musselman in 1981 included an analysis of the time saved by farmers who switched from a moldboard plow to a disk system or a no-till system. They assumed that a farmer reinvested the time savings in row crop production. The farmer could operate 395 more acres with a disk or chisel tillage system and 1,081 more acres in a no-tillage situation—compared with use of a moldboard plow system.

These situations have become land use issues because solutions have not been readily available or easy for society to agree upon. Solutions lie in the complex social-political-legal economic framework of our society. □

New Land Laws

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A county Extension director in Iowa pulls apart a 1983 Plat Book and distributes the pages to waiting township trustees. (Townships contain 36 sections. The trustees are local elected officials.) The trustees gather around tables, examine the information about current land use and, based on their knowledge and experience, list changes which have occurred in the last 23 years.

"In a rural county like ours," the Extension director explains, "the trustees know about virtually every transaction, how many acres were involved, and what the land is being used for now."

At the county level, the data provided by the trustees will be checked against maps and aerial photographs from the U.S. Department of Agriculture's Agricultural Stabilization and Conservation Service (ASCS) and Soil Conservation Service (SCS). The resulting land use inventory will be forwarded to Iowa by February 1, 1984.

This is how one county responded to the passage of the Iowa Land Preservation and Use Law in May 1982. This legislation is designed to gather information about land use change and to provide a new tool for preserving agricultural land.

The Setting
As in many states, land use planning in Iowa has achieved only partial acceptance. State enabling legislation is permissive. Agricultural activities are specifically exempted from county land use regulation. Local governments are left free to elect to plan or not to plan. About one-third of Iowa's 99 counties do not have planning programs.

Yet, broad support exists for land use planning, particularly as it relates to the preservation of agricultural land. Studies done in 1980 and 1981 reveal that 77 percent of farmers and 87 percent of urbanites said they were "very favorable" or "mildly favorable" when asked to appraise the desirability of land use planning.

The Iowa legislature has tried to treat land use issues over the past several years. In May 1978, a temporary State Land Preservation Policy Commission was organized, and similar groups were set up at the county level. That effort focused primarily on surveying existing land use policies for the preservation of agricultural land and making recommendations to the legislature. It was followed by the current legislation that calls for a land use inventory and establishment of agricultural areas.

Problems and Issues
Of course, this land use effort has not been without its critics. Many counties delayed inventory efforts because a moratorium was proposed and later defeated in the general assembly in the spring of 1983.

A primary criticism of the law has been that it does not address the issue of how the new inventory and planning effort relates to any existing planning process which is ongoing in the county. Counties which have planning programs are left on their own to answer such questions as the following: Does this new plan replace or supplement the existing county plan? How does the newly created County Land Preservation and Use Commission relate to already existing bodies, the county zoning commission and board of adjustment?

Counties which have found planning unacceptable in the past are reacting in different ways. Some are continuing to resist the current inventory efforts. Others are viewing them as an opportunity to take a look at their situation without embarking on a fullblown planning program.

Once the inventory process has been completed, the studies will be useful at both states and local levels. Of particular interest will be indication of any trends on conversion of farmland to other uses.

How the New Law Works
Under the new law, each county was directed to form a 5 to 6 member county land preservation and use commission by October 1, 1982.

The Land Preservation and Use Commission is to compile a land use inventory, propose a county land use plan to the board of supervisors, or submit to the board a set of written findings on land use.

County Land Use Inventories
Each county is required to compile a land use inventory covering its unincorporated areas, and the areas within the boundaries of its cities which are taxed as agricultural land. The inventory is to be completed by January 1, 1984.

If data are available, the county inventory is to include:

- The land available and used for agricultural purposes by soil suitability classifications or land capacity classification.
- The land used for public facilities (park, schools, government buildings, and historical sities).
- The land used for private open space (woodlands, wetlands, and water bodies).
- The land used for other uses (commercial, industrial including

Where town and country meet conflicts can and do occur. Iowa's new land use law calls for an inventory of land converted from agricultural to other uses since 1960.

mineral extraction, residential and transportation).

In addition, the law requires that the inventory reflect the amount of land converted from an agricultural use to a residential, commercial, industrial, or public use since 1960.

The Iowa State University Cooperative Extension Service is directed by the legislation to provide technical assistance to the counties. County and Extension staff members have ferreted out sources of current and 1960 era land use information.

In addition to the recollection of long-term county residents, counties are finding that aerial photographs, soil surveys, section maps, plat books, transportation maps, and aeronautical charts are useful sources. Locating and cross checking all of the various data sources can be time consuming. Many counties have hired student interns to assist.

To encourage uniformity of inventory products, the Cooperative Extension Service and state officials put on a series of workshops and training sessions throughout the state. A set of tables was also developed so that counties could submit their findings in similar formats.

Next Steps
The completed county land use inventories are to be submitted by February 1, 1984 to a state interagency resource council, which will compile a report to the legislature.

Following the completion of the inventory, the counties have an option. The legislation calls for each county land preservation and use commission to give the board of supervisors a land use plan or the land use inventory, together with a set of written findings on how to preserve agriculture and other important land uses.

If a county land use plan does result from this effort, and it is adopted by the board of supervisors, the plan becomes the land use policy of the county to be administered and enforced by the county in the unincorporated areas.

Agricultural Areas
Another provision of the Iowa Land Preservation and Use Law enables an owner or group of owners of farmland to submit a proposal to the county board for the creation of an agricultural area. The area, at its creation, must include at least 500 acres of farmland. The proposal must include a description of the proposed area and its boundaries. The territory must be as compact and as nearly adjacent as feasible. Land may not be included in an agricultural area without the consent of the owner. Agricultural areas may not exist within the corporate limits of the city.

The use of the land in agricultural areas is limited to farm operations, residences constructed for occupation by a person engaged in farming or in a family farm operation, nonconforming pre-existing residences, and the property of a telephone company, city utility, or public utility.

In exchange for accepting these restrictions, the law offers landowners some protection from nuisance suits, special tax assessments, and certain state regulations. Agricultural Areas are also granted limited water priority by the new law.

Questions and Issues
Numerous questions have arisen. Can agricultural areas be used to block municipal annexation? The attorney general says no. Is a county liable for failure to check legal descriptions and to enforce the use restrictions? Again, the attorney general says, "no."

The concept has been popular with farmers and farm organizations. A number of agricultural areas have been formed, some involving thousands of acres. But the question remains, will this prove to be an effective tool for agricultural land preservation, or will it be used in ways which work against public sector planning?

The agricultural areas measure, compared with other agricultural land preservation techniques, is simple and straightforward and it does not entail major, direct cost to the public. Agricultural areas may, at least in the short run, protect valuable farmland. □

Saving Suffolk County

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Suffolk County, encompassing the eastern two-thirds of Long Island, may rank as the fiercest environmental battleground in the United States.

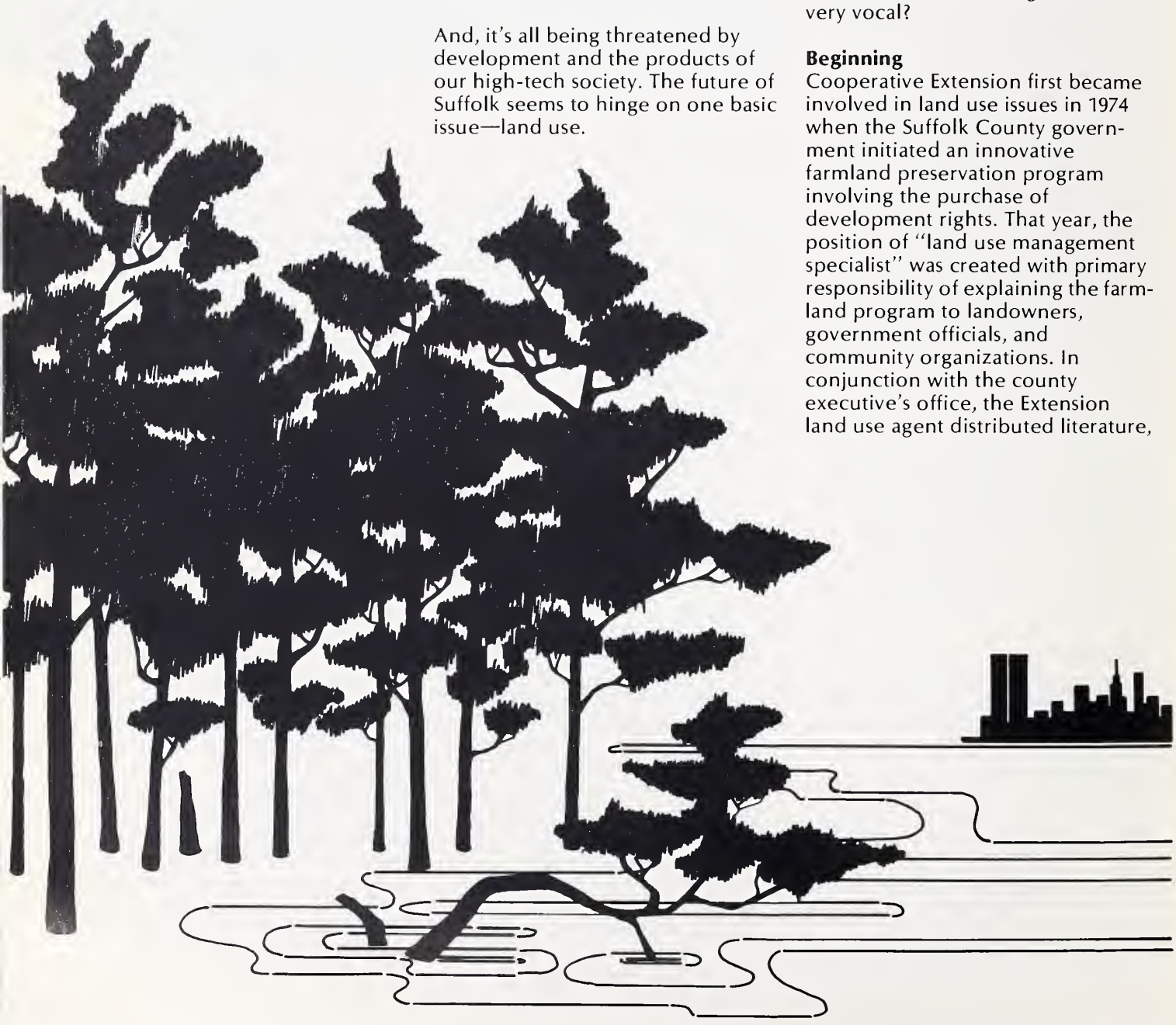
Jutting out into the Atlantic Ocean in the shadow of New York City, Suffolk is at once one of the most populous suburban enclaves on the eastern seaboard and New York State's leading agricultural county. Enclosed within its boundaries are fragile marine resources, 40,000 acres of prime farmland, four rivers and innumerable streams, and a 100,000-acre tract of Pine Barrens forest. Beneath the land lie aquifers which are the entire source of water for the county's 1.3 million residents.

And, it's all being threatened by development and the products of our high-tech society. The future of Suffolk seems to hinge on one basic issue—land use.

Cooperative Extension has long been a positive influence in Suffolk, especially among farmers, homemakers, and youth. But what role can it play in helping to resolve such a monumental concern as land use, especially in a county which boasts some of the finest land use planning agencies in the Nation and where environmentalists and civic associations are well organized and very vocal?

Beginning

Cooperative Extension first became involved in land use issues in 1974 when the Suffolk County government initiated an innovative farmland preservation program involving the purchase of development rights. That year, the position of "land use management specialist" was created with primary responsibility of explaining the farmland program to landowners, government officials, and community organizations. In conjunction with the county executive's office, the Extension land use agent distributed literature,



made public presentations, and responded to inquiries about the mechanics of the program.

So rapid and complete was public acceptance of this program that the agent soon turned to other land use and environmental issues.

In mid-1975 the Long Island Regional Planning Board (RPB) received a $5.2 million grant from the U.S. Environmental Protection Agency (EPA) to develop a comprehensive water quality management (208) plan for Suffolk and adjacent Nassau Counties. Since this plant would examine land use practices and central measures, the agent joined the Citizen Advisory Committee (CAC) created to work with the RPB and technical consultants. Through this study, Cooperative Extension firmly established itself as a resource on land use and environmental issues.

Over the course of this 3-year study, the agent wrote articles for the 208 CAC Newsletter; compiled a slide program on the 208 study and plan; helped organize a public information program in conjunction with several environmental organizations; and compiled an executive summary of the plan. Since the 208 Plan was published 4 years ago, the agent continues to serve as vice chairman of the committee and works closely with the RPB staff in implementing of the plan. This includes publication, by Cooperative Extension, of several publications on such topics as nonpoint sources, suggestions for homeowners, and the land use controls to prevent water pollution; and the writing of articles for the 208 CAC Newsletter, compiling of slide programs on solid waste disposal practices and on nonpoint source control; and reviewing the RPB nonpoint source handbook.

Coastal Zone Management

As the 208 study was getting underway, the Rural Planning Board also prepared a coastal zone management (CZM) plan as part of a statewide program. Since this encompassed important land use considerations, the Cooperative Extension agent joined the Citizen Participation Committee created to advise the RPB staff. In an effort to increase interest and participation in this program, the agent, in conjunction with the local Sea Grant specialist, compiled and distributed a periodic newsletter summarizing the various coastal concerns and management measures. A slide program on local coastal issues was also compiled for community groups. The agent now serves as an advisory member of the Nassau/Suffolk Marine Resources Council which is helping to implement the CZM plan.

The Pine Barrens

In the wake of the 208 study and four significant findings that Suffolk's groundwater is endangered, attention focused on protecting the last major uncontaminated area in Suffolk County—the Pine Barrens. The county planning department initiated a comprehensive land use planning program in 1981 to protect this 100,000 acre forest of pitch pine and oak. The Cooperative Extension agent is chair of the Pine Barrens Planning Council which brings together representatives of a wide range of constituencies to advise the planning department staff. In addition, the agent compiled and distributed a bulletin about the Pine Barrens, compiled a slide program which serves as a resource on land use management measures.

Other miscellaneous activities and projects undertaken through the land use program include compiling of an extensive report on the Peconic River, the largest in the county, for designation under the State Wild, Scenic, and Recreational Rivers Acts; conducting courses on how to compile a natural resource inventory, publishing a series of 23 fact sheets on real property assessment and taxation, and sponsoring of training courses for members of local planning boards and zoning boards of appeals.

Summary

As can be seen, the role of Cooperative Extension in Suffolk County has been primarily that of an educator and facilitator. Regardless of the specific land use or environmental issue, the services provided are essentially the same: participation on advisory committees, distribution of information, compilation and presentation of slide programs, referral of inquiries to appropriate agencies, and sponsorship of short training courses.

The land use program, although a major effort, is but one element of Cooperative Extension's comprehensive Community Resource Development Program which also includes educational programs relating to housing issues, energy policy, process skills, and local government operations.

Audiences for the land use program are those individuals and organizations most involved in land use and environmental issues. These include county and town elected officials, local planning boards and environmental agencies civic groups, environmental organizations, and other community leaders. Representatives from several of these have agreed to serve as an official Cooperative Extension advisory committee to help guide the land use education program. This committee also serves as an advocate for the program both within the Cooperative Extension Association and community. □

Fighting Soil Erosion

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The year 1979 marked the beginning of a new plan to combat an old enemy, soil erosion, in west Tennessee.

Soil erosion losses in the area rank among the highest in the nation. On 2.3 million acres of sloping cropland, erosion rates averaged about 40 tons per acre annually. These losses represent a serious threat to long-range agricultural production in the area.

Fertile Farmland
West Tennessee's 21 counties rank high in importance in the state's 2 billion dollar agricultural industry. They account for about 80 percent of the state's soybeans, more than 67 percent of the wheat, 47 percent of the corn, 93 percent of the cotton, 18 percent of cattle and calves, and 46 percent of the state's hogs and pigs.

In 1979, local, state, and Federal agencies, and consumer groups joined with farmers to meet the challenge of soil erosion, water quality, and related resources in west Tennessee. The Tennessee Rural Development Committee assumed leadership in developing a multiagency plan to reduce soil losses. The Tennessee Erosion Control Coordinating Committee, a subcommittee of the State Rural Development Committee, continues to direct and evaluate the program.

Additional staff time, financial assistance, and technical support have been provided by state and Federal agencies.

Yet, increasing farm expenses and low prices for agricultural products have made it hard for many Tennessee farm operators to finance engineering structures. "Growers have always wanted to take the steps necessary to conserve their soils," emphasizes Clark Garland, University of Tennessee Extension Service farm management economist. "However, soil conservation generally has been a long-term project—and farmers need income today."

Use of No-Till Plantings
According to findings of research scientists at the Milan Experiment Station and other Tennessee agricultural experiment station units, west Tennessee farmers can reduce soil losses and increase farm income by using no-till production techniques. No-till planting of soybeans runs about $12 an acre less than conventional tillage.

"No-till farming can reduce erosion to acceptable levels and permits a more intensive use of the land," Garland explains in his message to 5,000 farmers and agribusiness representatives attending conservation tillage programs in mid-July.

Garland and Estel Hudson, Extension Service farm management economist in west Tennessee, presented information from area farmers that showed how to expand total farming operation based on labor saved by no-till production. This method substantially increased total farm income.

Demonstration Farms
In 1982, 114 farmers participated in the Resource Management Conservation (RMC) Program, part of the six-phase conservation program. Thirty more enrolled this year.

Program staff develop a farm management plan that emphasizes soil erosion and improved water quality, for each RMC farmer. Extension Service and Soil Conservation Service personnel assist in developing a "maximum income plan" in which all fields meet soil loss tolerance.

Agents conduct on-farm demonstrations to prove recommended practices related to conservation.

Farmer Joe McDaniel (right), and his son Tim examine corn that has been planted in grass using recommended no-till procedures. They were assisted by Extension personnel as part of the Resource Management Conservation program.

Hudson cites an actual farm situation in Henderson County: "About 110 acres of his farm should have been row cropped under conventional tillage only 2 years out of 4 to prevent severe erosion," Hudson says. "In the other 2 years, the land should have been returned to meadow or forage crops."

Hudson points out that forage crops don't generally have the income potential of row crops. The farmer could, he explains, attempt to control his soil loss mechanically, but this procedure would cost him more in installation and the mechanical devices would require maintenance.

Conservation Tillage Pays
The RMC management plan developed for this farm recommended planting the 110-acre tract in no-till soybeans 2 years out of 3. This

Top left: Farmer James Kendall signs a contract that helps place the Reelfoot Lake Clean Water Program over the $1 million mark for special Federal cost-share funding. Bottom left: Soil scientists evaluate soil samples in an accelerated soil survey designed for erosion control planning. Below: Over 5,000 farmers attended the Milan Experiment Station field day and saw demonstrations of the latest in no-till equipment.

reduced soil losses to a more acceptable level of 3.5 tons per acre annually. Under conventional tillage, 40 tons per years were lost for each acre, for a total of 4,400 tons for the entire tract.

The farmer saved $1,158 a year using no-till. Further, being able to plant a row crop rather than following the land—added another $4,584 to his income.

Labor and equipment savings from no-till allowed the farmer to rent an additional 129 acres. Income from row cropping that land reached $4,515, pushing the total increase due to the change to no-till to $10,257.

No-till crop production has increased dramatically since emphasis was placed on reducing soil erosion. Many farmers are investing some of the extra income from changing agronomic practices into engineering structures that will further cut erosion losses and improve water quality.

Six-Phase Program

Since 1979, 12 areas (totaling 29,362 acres) in 12 counties have been designated for special assistance in Small Resource Conservation Management Areas. This phase of the conservation program extends the RMC farm principle to watersheds or drainage areas of 1,000 to 2,500 acres. Farmers can obtain special cost-share funds in these approved areas.

Large Resource Conservation Management Areas are similar except for size. Federal funding of $4.5 million has been secured for the Reelfoot Lake Drainage Area. It consists of 760 farms totaling 153,600 acres and is located in three counties.

Annual cost-share agreements have been approved on 126 farms enrolled in the special ACP project in the Forked Deer Watershed. These long-term agreements, for 3-10 years, have provided $1.2 million in Federal funding for cost-share assistance during the past 3 years.

The Accelerated Information and Education phase of the program will increase awareness of erosion and water quality problems by the general public, landowners, and farm operators.

"Resources in Review"

Over 1,200 farmers and agribusiness representatives participated in the "Resources in Review" program at the Jackson Civic Center in mid-July. This program consisted of a banquet followed by a report of 4 years of progress in the 6 phase conservation program. Keynote speaker was Wilmer D. Mizell, Assistant Secretary Of Agriculture for governmental and public affairs.

The following day, over 5,000 people from several states attended a No-Till Field Day at the University of Tennessee's Milan experiment station. They took research tours featuring no-till production practices for soybeans, corn, wheat, cotton, and grain sorghum. They could also see demonstrations of no-till planters and equipment, static displays, and a weed, disease, and insect identification clinic.

The sixth annual Southeastern No-Till Systems Conference completed the 3-day activity. Researchers from throughout the region discussed ongoing studies in their respective states.

International Interest

Agricultural officials and farmers from the United States and around the world have visited west Tennessee to study the methods developed and implemented by cooperating agencies to address soil and water conservation problems. Over 200,000 acres are under no-till in west Tennessee this year, compared with 40,000 acres in 1978. □