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NORTH DAKOTA Farm Research

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ABOUT THIS ISSUE
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This issue of Farm Research is different. It usually contains reports of research conducted by North Dakota State University. The current issue relates some of the activities of the NDSU Cooperative Extension Service.

It is significant that the entire issue is devoted to extension work. The Cooperative Extension Service is designed to help citizens apply the results of research to their everyday living. Every citizen of the state has access to North Dakota State University through the local County Extension Office.

The NDSU research and extension system is a dynamic, vibrant, moving force in the lives of North Dakotans. To North Dakota families, Extension staff are purveyors of information, interpreters of knowledge, and consultants in the processes of management and decision-making.

The beneficiaries of this educational network are not only farmers, ranchers, homemakers and their families, but also other citizen-consumers as well. The Extension worker assists in identifying problems of the clientele, feeds those questions into the research system, and takes the results of completed research back to clientele for application.

Extension staff are in your community to serve you. Much of the time, they perform their roles as educators and counselors in person. Routinely, they provide information to electronic and print media, which aid in disseminating knowledge by distributing the information to the people of the State.

Regular readers of this publication probably are personally acquainted with one or more Extension workers. Professional Extension staff are assigned to every North Dakota county, serving the people through 53 county offices. There are 108 county agents, home economists and area agents residing throughout the State. They provide "first-line" contact with the University.

These county and area staff are supported by 80 campus-based Extension specialists, trained in a wide range of technical subject matter. You'll see staff names and assignments in the roster, pages 31-34. During 1981, this knowledge team invested a total of 181.5 staff years, and made more than 432,000 educational contacts with citizens of the State. Paraprofessional, clerical and support staff, along with hundreds of volunteer local leaders, complete the network.

It's a highly functional system. Created in 1862 by federal legislation known as the Morrill Act, Land Grant Universities such as NDSU are charged with the responsibility of being "the people's college." The



Hatch Act of 1887 made the Experiment Station system possible, and the Smith-Lever Act of 1914 enabled each state to establish an Extension Service as part of the Land Grant University.

The legislative base for Extension work provides a cooperative funding approach from county, state and federal levels of government. No single level dominates, while the partnership provides a base for responsiveness at all three levels.

But the main actors in this everyday drama of applied education are you — the users of the system. The reports contained in this issue describe Extension programs conducted with real, live, North Dakota citizens who are actively involved in Extension programs. Though not identified by name, you may recognize yourself or your community in one of the articles. The stories were written by county and state Extension staff, but they are about the people we serve.

It's one way of reporting to you on some of our efforts to provide statewide educational programming. I hope you share our enthusiasm for continuing education, and that you enjoy reading about yourself and your neighbors in this issue.

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A BIMONTHLY progress report published
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North Dakota Cooperative Extension: Combining Specialties For A Better Life

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Except for efforts specifically targeted at non-farm audiences such as landscaping and gardening, Expanded Food and Nutrition, and Urban 4-H, the programs of the Extension Service are aimed primarily at rural audiences.

These programs are developed and carried out in a variety of ways. They include involvement of volunteers, paraprofessionals, and many public and private agencies, organizations and groups. Educational programs over a wide range of subject matter topics are focused on all components of the rural family.

The profitable production of food and fiber products involves the development and delivery of educational programs involving a wide variety of specialized disciplines to develop effective Extension programs. This variety of disciplines must be effectively integrated to address the complex production and economic problems faced by North Dakota producers.

CROP PRODUCTION

Extension programs relating to crop production in North Dakota begin with the determining economically and biologically sound rotations for a wide variety of resource situations. Factors taken into account include soil type, moisture availability, potential pest problems, relative production costs, and probable selling prices to determine potential profitability of alternate crop rotations.

Producers' desire to conserve both energy and natural resources leads to constantly changing tillage systems. Interest is currently growing in systems that reduce the amount of mechanical tillage used to produce crops. This change leads to numerous other changes in the

micro-environment in which the crops grow. It may affect the way different varieties perform; it may affect the fertility and pest management systems required to produce crops at an optimal level.

A major responsibility of the Extension Service is the timely dissemination of research information relating to the performance of new varieties of crops under changing growing conditions; the safe and effective use of plant nutrient materials; the discovery and diagnosis of pest problems; and the effective use of both chemicals and cultural practices to reduce crop losses because of pest infestations.

Other programs relating to the efficient harvest, conditioning, and storage of farm crops are carried out. These assure that farmers obtain as much of the crop produced as possible and maintain the quality of that production in order to preserve its value until they deliver it to market.

LIVESTOCK PRODUCTIONS

Educational efforts in livestock production involve the efficient production and use of forage and feed materials in the production of animals for food, work, and pleasure. Programs include the design and operation of the structures and facilities to effectively house livestock and protect them from severe climatic conditions. North Dakota is an active participant in the Midwest Plans Service. This regional team of agricultural engineers share their expertise in the development of building and facility plans that are basic to livestock production in the region.

Regardless of the species of animal, efficient production has its roots in the genetic capacity of the individual

animal to convert forage and feed materials into usable products. Programs to assist livestock producers in understanding and implementing programs designed to improve genetic capacity of their livestock are carried out. Operations such as the Dairy Herd Improvement Association, the Beef Cattle Improvement Association, boar test stations, and similar activities are associated with Extension Service activity throughout the state.

Without a nutrition program that provides for the full use of its genetic capacity, no animal can achieve its potential. Proper levels of nutritionally balanced feeds allow this potential to be approached. Developments in computer technology and the ability of computer programs to individual producers provide the opportunity for formulating economical and nutritionally balanced rations with available feedstuffs. Educational programs on the development and effective uses of pastures, ranges, and harvested forage are carried out.

The health of the animal is also important to the realization of its genetic potential. Programs that stress the importance of management in disease prevention as well as treatment are carried on with producers and veterinarians.

BUSINESS MANAGEMENT AND ECONOMICS

The survival and success of the farm business goes far beyond the ability to combine physical, biological, and natural resources to produce crop and livestock. The management of financial resources is becoming increasingly critical to the successful farm business.

The form of business organization to satisfy the needs of the operation is becoming increasingly important. The needs of the individual operation can vary on the basis of the number and contributions of the owners and operators, their tax objectives and estate transfer considerations. Programs that help producers analyze alternative forms of business are important Extension offerings.

The development of both short and long term financial plans and strategies are necessary to provide for the successful maintenance and growth of the business as well as to provide support for the farm family. Annual financial decisions involve estimating potential returns, production costs, and profits for the various crops and livestock enterprises that can be produced in the operation. Educational programs that develop producer skills in the development and analysis of physical and financial records are fundamental to improved decision making. Programs in tax management help producers maximize after tax returns from the operation of the business.

Long range planning for the growth and maintenance of the farm business is also important for success. Decisions about the addition or deletion of business enterprises that require a change in facilities are critical to the long run survival of the business. Acquiring additional

land, adding livestock enterprises, and other adjustments require substantial capital outlays. They can only be accomplished if complete long range plans determine the financial feasibility from the standpoint of both profitability and repayment capacity. Several computer programs on the AGNET system increase the capability of state and county Extension staff to assist producers in developing financial plans.

AGRICULTURAL MARKETING AND FARM SUPPLIES

Farm production cannot be profitable unless the commodities produced are marketed effectively. Farmers must understand the nature and operation of the markets that handle their production from the farm gate to the consumer's table, whether at home or abroad. The marketing system that adds value, geographic dimension, and in many cases changes the product from raw materials to a consumable form, plays an important role in determining the profitability of North Dakota Agriculture. Educational programs relating to the outlook for commodity prices are carried on. In-depth Extension marketing workshops are conducted regularly. They are designed to indicate the importance of marketing plans and strategies, and to assist producers in development of such programs.

NATURAL RESOURCES AND THE ENVIRONMENT

The long run viability of North Dakota Agriculture hinges heavily on the maintenance of the quality of the natural resources used in crop and livestock production. Educational programs relating to soil and water conservation are carried out in concert with numerous other organizations in North Dakota with common interests in maintaining the natural resource base. Close working relationships exist with both the U. S. and North Dakota Forest Service, the Soil Conservation Service, the North Dakota Association of Soil Conservation Districts, and the North Dakota State Soil Conservation Committee. Educational efforts aimed specifically at water quality maintenance and improvement have been carried out in cooperation with the North Dakota Health Department.

Active programs are carried out in the planning, establishment, maintenance, and renovation of windbreaks and farm shelterbelts. These protection-type plantings assist in controlling wind erosion throughout the state. Farm shelterbelts, in addition to being aesthetically pleasing, provide substantial energy savings when appropriately placed. They improve livestock production by providing relief from the severe wind chill of North Dakota's winters.

MECHANICAL SCIENCE TECHNOLOGY AND ENGINEERING

An almost endless array of new mechanical, electric and electronic technology has continued to become

available to North Dakota producers and households over the past several decades. Understanding and effective adoption of this new technology underlies much of the increased productivity and standard of living that North Dakota families enjoy.

Extension programs relating to rural electrification and the safe and effective use of electrical power in homes and on farms are carried out.

Programs that share research results in the development and use of renewable fuels have been developed. Liquid fuels such as alcohol and vegetable oil are being researched, and the results delivered to producers. Biomass burning (primarily for stationary energy uses) is an important engineering problem currently receiving attention.

Emerging educational programs that will be extremely important involve the adoption of electronic technology both for pleasure and for improved management of the farm business. Monitoring of production techniques and practices will increasingly involve the use of special purpose computers. Home computers for the maintenance of both production and financial records as well as family entertainment and learning experiences provide an exciting opportunity for Extension programs in the future.

SAFETY

Nothing is more disruptive of the best laid plans for both family and agricultural production than a serious injury or accidental death of a family member. General awareness of hazards around the home and farm are an important part of avoiding accidents and injury.

Educational programs to improve the skills of individuals and of community groups such as fire departments, and rescue squads are an important training aspect in order to provide effective care when accidents do occur.

A specific charge of the North Dakota Extension Service by the 1975 Legislative Assembly was to provide for the training and certification of Commercial and Private Applicators of "restricted use" pesticides. Over 3,000 Commercial Applicators of chemical materials in a broad range of categories are currently certified as having been satisfactorily trained. Over 25,000 individual farmers have been trained in the safe and effective application of pest control materials on their own farms.

COMMUNITY RESOURCE DEVELOPMENT

Educational programs in community resource development focus primarily on improving the skills of individuals to participate in group decision making. The primary focus of small community programs involves the development of leadership skills. Such development enhances the capacity of local leaders to consider the goals and objectives of the individual community, assess the resources available to achieve those goals and develop strategies to effectively utilize local resources to accomplish group objectives.

Specific courses in the fundamentals of determining the feasibility of new business activities, and the methods for establishing them have been carried out in many communities in North Dakota.

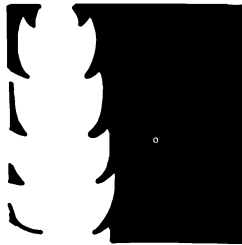
Determining the desire of the entire community is an important foundation in order to obtain a broad commitment in the community to accomplish an economic or social change. extension assistance in the conduct of community attitudes surveys aids in determining the extent to which community goals have citizen interest and support.

Many community resource development programs are carried out in close concert with human, social, and business agencies and numerous private enterprises.

Successful improvement of communities in many cases hinges upon a complete understanding of the operations of local governments and the methods of financing local government activities. Educational programs are carried out in many communities regarding the sources and uses of tax revenues to accomplish the objectives of the individuals affected.

Many communities experiencing dramatic changes, either due to declining farm populations leading to gradual business decline or rapidly expanding populations in business activities, create stresses on local government operations like schools, law enforcement and other public services. Dealing effectively with these community problems has an important impact on the satisfaction and quality of life of the community's residents. Community plans based on a broad consensus of the citizens involved are basic to dealing with situations of economic and social change.





Crop Production

NDSU — U of M Beet Programs: A Million Dollar Connection

ALLAN W. CATTANACH
Extension Sugarbeet Specialist

Take dedicated researchers and extension workers, add willing cooperators, blend in sugar factory interest, stir well with liberal funding for research and extension programs, and you have a prize winning recipe. From modest beginnings in 1961 (grower contributions totalled \$4,000), support for extension and research continues to increase as growers require more knowledge to keep abreast of rapidly expanding technology. Annual grower funding broke the \$100,000 mark in 1975, and the 1981 budget was over \$200,000, making total contributions of over to 1.4 million since 1961.

Much of the credit for successful sugarbeet research and extension programs in North Dakota and Minnesota must go to the Sugarbeet Research and Education Board of Minnesota and North Dakota. Board membership includes seven sugarbeet growers, Don Klein, Fisher, MN; Manvel Green, St. Thomas, ND; Boyd Galegher, Thompson, ND; Paul Horn, Moorhead, MN; Alvin Hansen, Baker, MN; Everett Wessels, Blue Earth, MN and Richard Mueller, Hillsboro, ND Other board members include Dr. William Pietsch, NDSU Extension Service; Dr. Gene Pilgram, U of M Extension Service; Dr. Don E. Anderson, NDSU Experiment Station; and Dr. B. E. Youngquist, U of M Experiment Station; Dr. Claude Schmidt, represents the USDA; and sugar cooperative members are Stan Bichsel, American Crystal Sugar Company, Gordon Rudolph, Minn-Dak Farmers and Cooperative and Ed Tanner, Southern MN Beet Sugar cooperative.

The board is responsible for developing an effective research and education program for the Red River Valley sugarbeet industry. They meet several times each year to review present research and extension efforts and to consider new programs. All board activities are funded by voluntary check-offs of 2 or 3 cents per ton from sugarbeet growers. This board makes grants for research and extension programs to NDSU, U of M, USDA and private research agencies. This board and its predecessor, the Red River Valley Sugarbeet Growers Association Research Committee have also been instrumental in establishing four full time sugarbeet research and extension specialists at NDSU and U of M.

Extension programs partially supported by these funds involve three full-time staff members: Dr. Allan Cattanach and Dr. Jerry Fitts, sugarbeet specialists, and Dr. Alan Dexter, sugarbeet weed control specialist. All are headquartered on the NDSU campus, but work cooperatively for the NDSU and Minnesota Cooperative Extension Services. Annual extension programs for sugarbeet growers include five multi-county sugarbeet grower seminars; numerous county or factory district meetings; a grower idea contest held in conjunction with the annual International Sugarbeet Institute; 15 or more weed control and other tours; and a research reporting session. Other activities include publication of the annual Sugarbeet Research and Extension Reports and a pocket production guide; training workshops for fieldmen and agents; publication of fact sheets; planting unit test stand sessions; weekly radio reports and troubleshooting through farm, field or factory visits.

State lines are virtually nonexistent in research efforts. For example, Dr. Larry Smith, U of M agronomist at the Crookston Experiment Station, conducts research that applies equally well on either side of the Red River, wherever sugarbeets are grown. Smith and other researchers have about 30 sugarbeet projects at the station, including pigweed and wild oat competition, deep nitrogen effects on beet quality, reduced tillage, effects of tillage operations on beet herbicide performance and weed populations, deep soil testing, planting-to-stand trials, and electronic thinner comparisons.

Smith also cooperates with G. L. Malzer, U of M Soils Department on a number of nitrogen studies in the Renville, MN area. N-rate and strip-N trials are conducted with cooperators in Renville, Chippewa, Kandiyohi and Grant counties in MN.

Cercospora disease problems approached epidemic or near epidemic proportions in many areas in 1981. Dr. Larry Smith, Dr. William Bugbee, Dr. Art Lamey, NDSU and Dr. Allan Cattanach have a number of cooperative projects looking at disease control, chemical resistance and variety evaluations.

While most of the Fargo-based researchers conducted studies in the Moorhead factory area, Dexter's 20 or more projects range from the Renville, MN area to Drayton, ND where the cooperator is Glen Gillishamer of Grafton, ND. Dexter conducts no-labor beet production and weed competition studies on the Paul Horn operation near Moorhead, MN. Another study at the Horn location compares EDS, herbicide roller, rope wick and recirculating sprayers for late post-emergence weed control. In 1979 the Horn farm was also the site of a cooperative study with NDSU Entomologist A. Anderson who continues to search for alternative methods of controlling the sugarbeet maggot and other beet insect pests. In the Minn-Dak factory area, Anderson has cutworm microplots and a study that uses sex pheromones as attractants for cutworm adults on the Roger Slotten farm near Dwight, ND.

While several well-known insecticides give excellent control of beet maggots, Anderson continues to investigate six new compounds that may be superior to existing chemicals or be necessary in case of insecticide resistance.

Temik, Counter, Dyfonate and Diazinon provide excellent to good control, while Lorsban appears effective since its registration last year. Anderson also is studying the movement and migration of adult populations of root maggots and their association with shelterbelts on the Gillishammer farm, Grafton, ND.

Fitts is studying band herbicide incorporation on the Charles Canning farm near Hendrum, MN and on the Boyd Galegher farm near Thompson, ND. On the Canning operation, Fitts is researching chemical anti-

crusting possibilities. He has conducted strip tillage demonstrations on the Galegher operation in the East Grand Forks factory district and compared-lay-by herbicides in 1981 on the Drees farm, Thompson, ND.

Joe Giles, NDSU soil scientist, is looking at tillage variations and compaction on the Horning Brothers farm near Chokio, MN and with Ray Hudson near Colfax in the Minn-Dak factory district; at the Fargo Experiment Station and on the Johanneson Brothers farm near Moorhead, MN; at the Northwest Experiment Station at Crookston, MN and at the Galegher farm near Thompson, ND.

Darrell Cole, USDA researcher stationed at NDSU has caught the interest of many Red River Valley beet growers with his studies comparing storability of scalped (crowns cut) versus flailed (crowns intact) sugarbeets, and with studies determining the effect of incomplete leaf removal on beet quality determination by tare lab procedures.

USDA Plant Pathologist Larry Campbell continues to evaluate the degree of resistance of different beet varieties in storage rots, selecting varieties for storage rot resistance and may be screening for varietal resistance to root maggots in the future.

Another USDA scientist, William Bugbee, is studying the interaction of Cercospora leafspot with commercial sugarbeet varieties, looking at the genetic resistance to Phoma seedling disease and evaluating for Phoma storage rot resistance. In keeping with the new nationwide emphasis on energy, Bugbee is maintaining uniform cooperative trials for evaluating potential production of ethanol from fodder beets.



Dr. Larry Smith, U of M, Crookston (left), and Allan Cattnach (right) discuss beet root growth with area farmers as part of a 1980 plat tour.

Statewide Soil Moisture Survey For Spring '81 Made Difference

Lack of snow and the open 1980-81 winter along with increased fall plowing for fall herbicide incorporation resulted in extensive wind erosion from bare fields. By late winter repeated dust storms coupled with depressed grower attitudes from the 1980 late spring drought produced a general impression of drought and impending disaster for the 1981 crop.

However, trained technical staff with North Dakota State University, the Soil Conservation Service and the Agricultural Research Service had observed normal to above normal rainfall state wide from mid-summer forward and had reason to believe the state had stored soil moisture for bumper yields in 1981 in specific areas and

normal or average yields state wide.

Staff and equipment were pooled as a joint agency effort and soil moisture samples were collected across the state as frost left the ground in late March. Time was critical. Farm management decisions were either being delayed or proceeding based on lower than average yield expectations.

Distribution of a small scale map showing state wide stored soil moisture turned grower attitude around as seeding time approached. This effort contributed toward North Dakota being the nation's #1 small grain producer in 1981.

Crop Management Shortcourses Promoted

Extension crop management shortcourses are designed to provide farmers in North Dakota with in-depth information on several subjects concerning crop management practices. NDSU Extension specialists cover subjects such as soils and fertilizer usage, weed identification and control, insect identification and control, plant disease identification and control, row crop production practices, crop drying, handling and storage and small grain characteristics and production.

From three to six shortcourses are scheduled in selected counties each winter. County agents request the shortcourses which run for two days each week for three consecutive weeks. Shortcourse participants are exposed to a total of 28 to 30 hours of intensive teaching. In addition to lectures and question and answer sessions, lab sessions in entomology, plant pathology and weed identification are conducted in order to give farmers "hands-on" experience in learning how to recognize and identify crop pest problems.

Each shortcourse participant is provided with a large three-ring notebook that is jammed with circulars, fact sheets, and pest identification aids. This notebook is designed to be a reference source that can be used when questions arise regarding crop management practices.

The crop management shortcourses were initiated in 1968, and since 1971, participants have responded to a three-page questionnaire sent to all enrollees after shortcourses have been completed each winter. The questionnaire is designed to determine the usefulness of the shortcourse to the participants as well as how the

shortcourse can be improved to better suit their needs. The average percent return on questionnaires mailed to shortcourse participants since 1971 is 62.5%.

From winter 1971 to winter 1981, the shortcourses have been held in 41 counties with a total attendance of 1,728 participants. Following are selected comments from former shortcourse participants regarding their feelings about the crop management shortcourse:

—"The course was very enjoyable and I'm looking forward to another one. I feel the business of farming is getting more complex and this is another way of staying on top of things. I would recommend it to anyone."

—"I really enjoyed the shortcourse. This is the first one that I ever went to one and I thought it was worth my time. I even skipped one week of work."

—"I compliment all the Extension people for the tremendous job you are doing. The opportunity of just getting to know the individual Extension people in your teaching program makes it much easier to call your staff when a problem or question comes up."

—"I really enjoy these types of courses. I took the crop management shortcourse in 1977 also and enjoyed this one (1981) as much or more. Keep up the good work."

—"The shortcourse was very interesting and informative. One of the other guys put it best, 'We learned more from this \$12.00 course than we did spending over \$12,000.00 in going to college.'"

CROPPAK Computes With Farm Needs

The AGNET program CROPPAK represents part of an overall Extension and research program aimed at developing "best management" crop production practices. One unique aspect of CROPPAK is the interdisciplinary approach in its development. Research and Extension personnel from many disciplines were involved in its development. Information was needed on soils, fertilizer, crop varieties, weeds, insects, precipitation and economic analysis.

With CROPPAK available on AGNET in county Extension offices, an effective program on crop management decisions is being implemented for individual farmers and small groups. County Extension agents assist with use of CROPPAK and interpretation of the results. The program permits farmers to analyze projected crop yields and economic returns from specific crop management practices based on their farm conditions. It indicates the relationship of available moisture, crop varieties, weed and insect control, fertilizer use on crop yield response and financial returns.

The CROPPAK program is a short range (one-year) crop production and financial planning model. CROPPAK can be used by farmers to generate and analyze the various crop production components and includes an

economic analysis of sunflower and small grains crops. The CROPPAK program makes yield forecasts based on the amount of water available for crop growth. It also includes the probability of getting various amounts of rainfall during the growing season for areas throughout the state.

CROPPAK is a computerized crop production and economic model that includes several modules. In addition to the yield forecasts based on water availability and precipitation probability module, CROPPAK includes modules for variety selection, weed information, insect information, fertilizer analysis and a short run economic analysis on returns over variable costs. These various modules can be used individually or in combination. For example, someone interested in specific information on insects or fertilizer can go directly to these respective modules, or CROPPAK can be run using all modules to obtain an overall short-run (one-year) financial plan for crop production.

Research and Extension staff will continue to update CROPPAK as new research information is available. Programs such as CROPPAK provide efficient and effective decision-making aids for North Dakota agriculture.

Integrated Pest Management Project Providing "Product Quality"

Integrated Pest Management as a formal part of the Cooperative Extension Service educational program was initiated on August 1, 1976. The original project included South Dakota and continued during a three-year pilot phase.

Initial IPM program emphasis was on wild oat control in small grains. However, the growing importance of sunflowers and dry edible beans as cash crops prompted modification of the original project to include the study of the pest complex for these row crops. Urban gardening through the master gardener program and use of the AGNET computer system as a field observation communication tool were also added.

Scouting of farmers' fields to monitor insects, weeds, and disease pest levels has been the main emphasis of the project. William Drummond, Area Extension Agronomist at Jamestown, heads up the project and is responsible for scout screening and training. He also observes the scouts' work throughout the scouting season from late May to late August. Scout training is conducted by Extension specialists at NDSU for scouts in this project along with scouts for private consulting firms and a regional service cooperative.

The 100 growers involved in the project have formed the Central North Dakota Pest Management, Inc., a grower corporation organized to provide their own management and handle their IPM business affairs. All scouting costs are paid by the growers through their legal corporation for the almost 22,000 acres involved.

The project has been beneficial to growers through reduced or more appropriate pesticide use. In addition, an improved "product quality" is apparent as scouts provide a more exact field pest level. These readings are coupled with improved economic thresholds for more effective control recommendations.

Farming methods are continuing to change as growers look to the university for assistance with the development of minimum or no-till farming methods. These changing farming methods affect pest populations, so IPM personnel are involved with field demonstrations, producer meetings, and tours.

All IPM activities are coordinated through the local county agents in 14 counties in North Dakota. An advisory committee also functions on a statewide basis.

Uniformity Becomes Hallmark For Chemical Incorporation/Application

Chemical weed control is more fuel efficient than tillage, but no herbicide is any more effective than the uniformity and precision with which it is applied. For herbicides requiring incorporation, the uniformity of incorporation is just as important as the uniformity of initial application. However, incorporation must be done with a minimum number of trips across the field to save time, money, energy, oil and soil moisture. With today's high energy cost, these conservation requirements are greater than ever.

Many different types of tillage tools are used by farmers to perform incorporation operations. New equipment is entering the market designed specifically for this task. The question facing farmers is, "What implements are best and how should they be operated?"

Studies designed to evaluate the incorporation capabilities of both conventional and newly designed tillage equipment have been conducted by several different sources. This information was used at a series of winter Extension meetings last year, where much discus-

sion developed on the selection and operation of incorporation equipment.

As a result of the high level of interest in the topic, a field demonstration program was developed for use at branch Experiment Station field days. A mixture of lime and fertilizer was spread on the soil surface to simulate a herbicide application that could be visually inspected. Incorporation passes with 17 tillage tools were conducted and each was evaluated for uniformity, depth, and completeness of incorporation. The farmers had the opportunity to watch the equipment in operation and evaluate the incorporation plots. Power and fuel requirements of the various tools used along the evaluation results from other studies were discussed.

This method of checking how good an incorporation job a tillage tool will do could be used by farmers in their own operations. Many indicated they would try this method as a check on their own equipment.

Because of the high level of interest expressed in this topic and the importance of good incorporation practices, this program will continue to be offered.



Vegetable Gardening Popular In North Dakota

Information collected from a statewide home garden survey indicates that over 70% of North Dakota families raised a vegetable garden in 1981 contributing to the popularity of Extension horticulture programs and publications. According to the National Association for Gardening, the national average this year is 47% (September 29, 1981). The 1981 date shows an increase in the percentage of North Dakota families raising home gardens over 1979 when 63.7% of those sampled indicated they had raised a garden that year.

Nearly 90% of these living on farms planted a home garden in 1981, while 64.7% living in towns or cities raised a garden. Overall, 2/3 of the families in North Dakota produced some fresh vegetables this year.

The economic value of home-grown fruits and vegetables is significant and could be valued in excess of ten million dollars of non-taxable income. Over one-half of



the people surveyed said they raised a home garden primarily because they enjoyed high quality fresh vegetables. Other reasons given for gardening were recreation or to save money.

North Dakotans have an advantage over many highly populated states in that they generally have more space to grow vegetables than those in urban cities.

Master Gardener Program Growing In 1981

The 1980 NDSU Extension Master Gardener Pilot Program was expanded in 1981 to four new locations in North Dakota. The 1980 program began in the southwest district when charter classes were presented in Dickinson and Bismarck. The 1981 program included a second class at Bismarck in addition to new program starts in Stanley, Fargo, Devils Lake, and Jamestown.

Approximately 25 volunteers from the 1980 program returned for refresher training sessions in 1981. (Statistical information on volunteer carryover is not available at this time.) In addition, to the second year returnees, one hundred one new volunteers were provided with 48 hours of horticultural training in 1981. We are now processing data on the accomplishments of the 1981 volunteer Master Gardeners.

The floral plantings at North Dakota State University have been featured in a new color slide-tape program entitled, "Northern Show Gardens," which was prepared for distribution by All-America selections. This production includes AAS floral display gardens from Alberta to Nova Scotia in Canada and the northeastern United States from New Jersey southwestward to St. Louis and northward to North Dakota.

North Dakota State University was recognized as an official All-American Display Garden in 1979. A

display garden takes the best of the new annual flower varieties and grows them for the pleasure and education of visitors.

Display gardens arrange AAS winners from the immediate past, present and future years in landscape situations. Some beds appear as part of the landscaping around public buildings. Display gardens do not have judges because the flowers and vegetables featured have already been designated for awards.

The All-America display gardens on the NDSU campus have been planted each summer near the Engineering Complex by Bob Askew, Extension Horticulturist. Other new flower introductions are included for evaluation. Observational data collected from these plantings are used to make recommendations on annual flower varieties for North Dakota gardeners. Homeowners can obtain a list of recommended varieties by requesting a copy of Extension Circular H-322, *Annual Flowers for North Dakota*.

The slide production, "Northern Show Gardens" can be requested for loan by writing to All-America Selections, P. O. Box 216, Sycamore, Illinois 60178. Allow four to six weeks ahead of a planned showing.



Livestock Production

Counting Sheep Keeps County Agents Awake

The North Dakota sheep industry continues to expand. Since 1979, the sheep population has increased 32%. A county agents' survey indicated that over 120 North Dakota flocks have 300 or more ewes. Of these, over 70% are reared in semi-confinement.

The North Dakota Lamb and Wool Producers Association has grown and become a very active spokesperson for the sheep industry. Memberships have increased to 175 compared to 60 in 1979. An annual sheep convention was initiated in 1979 and drew 240 in 1980. Through efforts of the NDLWPA and the Extension Service, Master Sheep Producers are now recognized

each year. Timely management ideas reach more producers, as well as county agents, than before through a monthly sheep newsletter sponsored by the NDLWPA and written by the Extension Service.

Utilization of the EWECOST computer program developed by NDSU Extension specialists has assisted producers as well as financial institutions in determining feasibility of sheep enterprises. Development of a new North Dakota Sheep Performance Program will assist producers in analyzing the productivity of their ewe flocks.



Confinement sheep in North Dakota (Hettinger Experiment Station).

Strategies Can't Dry Up Under Drought Conditions

Drought conditions plagued much of North Dakota in 1980-81. As a result, normally adequate feed supplies were severely depleted. Resulting high feed prices and already prohibitive interest rates made it economically unfeasible for producers to purchase large amounts of livestock feed.

The severe drought conditions prompted the North Dakota Cooperative Extension Service to examine various livestock management alternatives. The alternatives basically involved heavy culling of poor producing animals and making maximum utilization of avail-

able feedstuffs. The available feedstuffs were often low quality roughages and the cheapest energy source was grain. With these alternatives in mind, strategies were developed to disseminate timely information to North Dakota producers. County agents were supplied with packets of information on managing livestock during drought periods, utilization of low quality roughage, and comparative feed cost tables. Radio and television programs were taped and news releases were prepared for the mass media. In addition, livestock producer meetings were held across the state concerning these matters and individual questions were answered.

Preconditioning Feeder Calves Means Less Feedlot Sickness And Death

Preconditioning of feeder calves means preparing them for market so there will be less sickness and death loss in the feedlots.

The program was started in 1980 and had the full endorsement of various segments of the livestock industry in North Dakota. The North Dakota Beef Cattle Improvement Association, Inc., (BCIA) agreed to underwrite the program. The BCIA directors, officers and members of the North Dakota Veterinary Medical Association and the Extension veterinarian have served as advisors to the program.

BCIA, through the Extension office, provides ear tags and certificates to practicing veterinarians who wish to cooperate on the program.

Certification requires that certain management practices be carried out before the calves are placed on the market. This includes weaning the calves at least 30 days before marketing. There were 43,569 calves certified from the 1980 calf crop, and it is anticipated that over 100,000 calves from the 1981 calf crop will be certified.

Extension, BCIA and the veterinarians have provided the guidance and education for the program and the regular marketing channels are providing a market for the calves. More than 20 special sales were held during the marketing season.

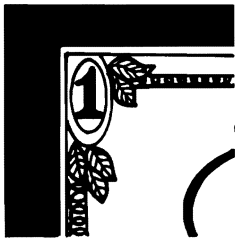
"FEEDMIX" Users Save \$1 Million In Last Two Years

The least cost ration analysis program "FEEDMIX" is the most widely used program on the North Dakota AGNET computer system. Least cost ration analysis is a computer program designed to formulate rations to meet an animal's nutritional requirements at the least possible cost. If done by hand calculation it is a long, laborious, almost impossible task. With a computer the calculations are performed instantly.

There are several basic requirements for a least cost ration analysis program to be successful. They include computer accessibility and personnel trained in computer usage and program interpretation. The computer must also have stored in its data banks information on nutritional requirements, feeds and their composition, feed prices and feed limitations. North Dakota AGNET and FEEDMIX have all these features.

The worth of any program is determined by its ability to make or save producers money through intelligent decision making. North Dakota county agents were able to document a savings to livestock producers last year of about \$441,000. The year before a savings of approximately \$570,000 was realized for a total of \$1,011,000 savings in two years.

There is presently a computer terminal available for use in every county agent's office in North Dakota. FEEDMIX is just one of the many programs on AGNET available to North Dakota producers.



Income Tax Management Aided By AGNET Program

Extension's efforts in income tax management are aimed to help farmers do tax planning to reduce taxes and increase after-tax income. All farm transactions affect taxes, but tax management is frequently left until late in the year. To assist farmers in this effort, several activities are scheduled during the year.

An Extension specialist is required to keep up to date on tax laws and interpret them as they affect farmers. The specialist provides training for county agents and vocational agriculture instructors and is responsible for holding income tax management meetings, providing the Farmers Tax Guide free through county Extension offices, and updating the AGNET PLANTAX program and helping individuals use it. Specialists and county staff also use mass media to inform farmers of tax law changes and to provide tax management tips.

With the passage of the Economic Recovery Act of 1981, it became necessary to write and publish a depreciation record book to use with the Accelerated Cost Recovery System. Since the law wasn't passed until late August, this became a "rush" job to get it printed in time to use in 1981.

During the past year, county agents and specialists held 25 meetings concerning income tax management with an attendance of 1,147 people. The AGNET PLANTAX program is updated as tax laws change and was used by about 5,000 North Dakota farmers. Over



13,000 Farmers Tax Guides are distributed annually through county Extension offices. More than 150 news articles were written by county and state staff on some aspect of tax management with about an equal number of radio and/or TV programs prepared.

These efforts are not intended to make tax experts out of farmers, but to provide information on tax strategies and the provision of the new law. Frequently this knowledge provides a basis for knowing they should consult their tax advisor, and to do it early enough to make action before the year's end that will reduce taxes and maximize after-tax income.

AGNET "FARMPLAN" Helps Farm Financial Future

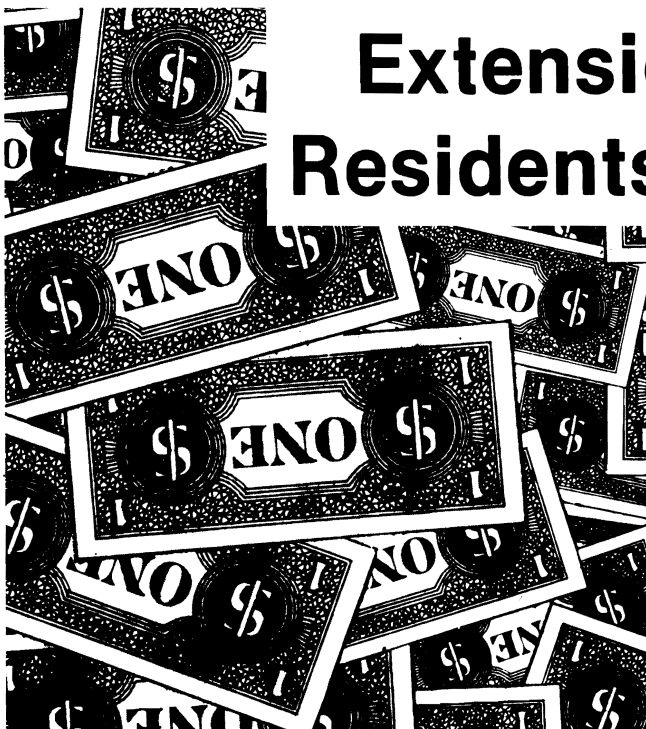
During the past several years, especially since 1976, the financial situation of a large share of North Dakota farmers has worsened. This is especially true of young, beginning farmers with low equity. The major factors causing this situation are double digit inflation affecting purchased farm inputs such as fertilizers, fuel, chemicals and machinery; high interest rates increasing the cost of borrowed capital and relatively low commodity prices, plus uncertainty based on periodic drought, harvest problems, hail, etc.

For a number of years Extension farm management specialists have conducted educational programs in the area of farm financial management. These programs over the years have included analyzing alternatives for managing the farm business, understanding the costs of production, causes and effects of inflation, farm

records, financial planning and long range planning.

During 1981 Extension farm management specialists in cooperation with NDSU research economists and with the development assistance of Extension specialists in animal science, soils and agronomy developed a teaching packet in long range farm planning. This material was designed to be used with a computer model on the AGNET system called "FARMPLAN." The purpose of the model is to assist producers in analyzing their long-run farming goals and to look at various alternatives of farm business organizations to reach family goals.

The computer model greatly speeds up the long-range planning process and allows the farm family to look at several farm plans in a short period of time.



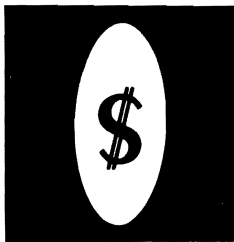
Extension Program Helps Residents Understand New State Tax Laws

In the fall of 1980, people in North Dakota were concerned about the possible effects of upcoming legislation on property taxes. In response to a State Supreme Court mandate, the 1981 legislature was committed to make significant changes in laws affecting equalization of assessments among classes of property for tax purposes. In particular, this could affect farmland taxes.

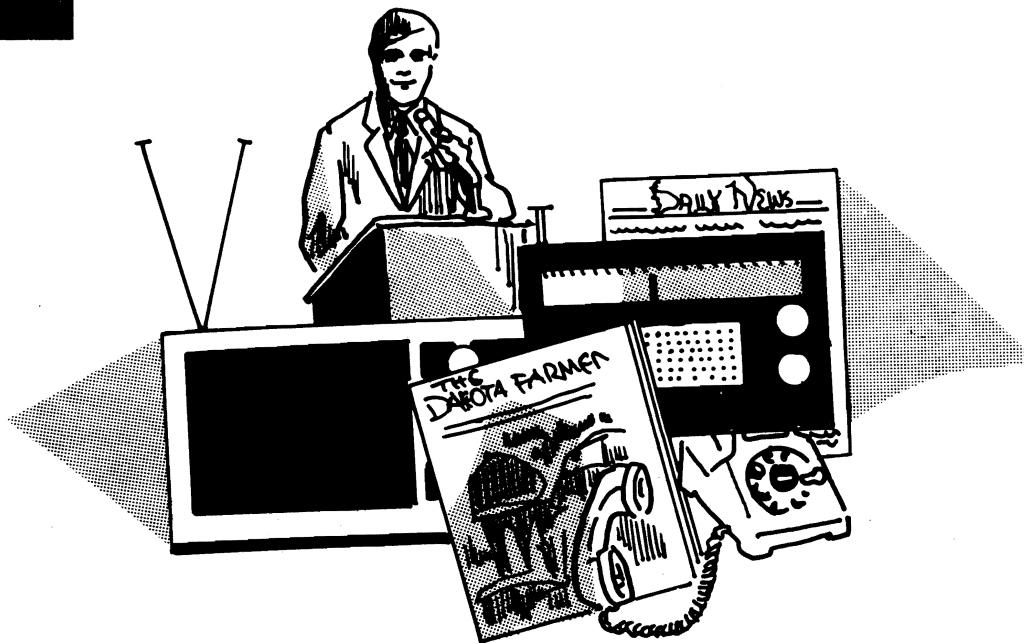
The Extension Service responded with an informational program to help people better understand the im-

pacts of changes in assessments and related property tax issues. In cooperation with county agents, an Extension specialist held meetings in about 20 counties. Audiences included township officers associations, community leaders, local officials and concerned citizens. About 1,000 people attended. Information included analysis of several proposed measures to be considered by the Legislature and property taxes as part of the state and local tax system. This information was also publicized through newspaper articles and the *Courier*, an economic newsletter distributed to about 7,000 farmers and rural leaders.

The 1981 legislature made significant changes in laws affecting equalization of assessments among classes of property. Of major significance is that farmland is to be assessed by its productive value rather than market value. The Extension Service prepared a publication explaining the farmland assessment procedure and the impacts of the new legislation on tax shifts among property classes. Informational meetings were also held as requested by county agents.



Agricultural Marketing



Mass Media Provides Marketing Outlook Blitz

A critical need for North Dakota crop and livestock producers is adequate and timely marketing outlook information. To help meet this need, the Extension Service carries out year-round outlook and other marketing information programs via the mass media that reaches virtually every producer, agricultural credit agency and agri-business firm in the state. The program is carried out cooperatively by Extension marketing economists and county agents.

Each fall the Extension crop and livestock marketing economists conduct an outlook "blitz." It all begins in August when the Extension economists from North Dakota, South Dakota and Minnesota jointly author an annual fall outlook publication which is published as an insert in *The Farmer/Dakota Farmer* magazine in September. The outlook insert carries management advice as well as forecasts of future supply and demand conditions and price prospects. These farm magazines reach about 40,000 subscribers in North Dakota and about 200,000 in the three-state area. This joint effort allows producers in all three states to benefit from the wide range of expertise of a larger group of economists. County agents receive extra copies of these inserts for distribution and use the information in consulting with farmers.

Extension marketing economists at North Dakota State University then use this jointly published outlook information and prepare a series of eight to 10 commodity outlook statements that are shown over many of the TV stations across North Dakota. The information is also disseminated over 30 radio stations and to all the newspapers of the state. Following the fall outlook "blitz," Extension economists and county agents periodically use the mass media to keep the outlook as current as possible for producers' use. Extension marketing economists also conduct outlook meetings in cooperation with county agents throughout the year. In the spring, the outlook information focuses on helping producers evaluate production alternatives and forward pricing opportunities for the coming year. The outlook often gives some profitable clues as to which crop should be planted and when it should be priced for future delivery.

The Grain Market News project, which is partially funded by a grant from the North Dakota State Wheat Commission, makes available, twice daily, opening and closing market prices and important market news items that have an impact on prices over 20 radio stations and by a telephone recording that can be reached by dialing 701-237-6200.

Marketing Workshops Target Crop And Livestock Producers

An important part of the marketing program is the marketing workshops conducted by Extension marketing economists as requested and arranged by county agents. These marketing workshops provide the opportunity to learn how to use marketing tools and information to increase economic returns. Agricultural lenders and other agri-business people are encouraged to attend, but crop and livestock producers have been the primary audience. Farm wives are encouraged to attend as a part of the business "team."

The workshops are conducted on crop marketing, livestock marketing or a combination of both. A four-day workshop includes both crop and livestock marketing. A two-day workshop is conducted for either crops or livestock marketing.

The general topics taught include the mechanics of hedging, estimating basis, charting, sources and use of outlook information, seasonal price patterns, developing a marketing plan and marketing strategies and evaluating marketing alternatives. A major portion of the workshop is work sessions, where the participants

push the pencil. Marketing concepts are reinforced through problem sets and exercises using actual market conditions.

A dimension that encourages followup to the workshops is the AGNET commodity futures trading game. The AGNET program provides the record keeping and brokerage function for "paper" trading in the commodity futures.

Following the workshop, county agents are encouraged to enroll interested participants in the futures game program for up to six weeks. This allows participants to put into practice many of the things learned in the workshop in a very realistic way. It clearly illustrates the pitfalls of speculating and the advantage of hedging in the futures market. During the duration of the futures games, the county agent holds additional meetings to review and clarify important marketing concepts.

A notebook is provided participants for ready reference as they pursue their marketing studies on their own.

County Agents Market Marketing Programs In '81

As implied by its title, "Extension" Service, the function of the Cooperative Extension Service is to "extend" the knowledge of the University to people throughout the state. The key to education "in the field" is the county agent. County agents serve as contacts for marketing information throughout the year with informational meetings, use of the mass media and in individual consultation.

To better provide information to producers, county agents receive subject matter training from state specialists in both crops and livestock marketing, the annual fall Extension conference. Major subject matter areas covered last year were cash marketing alternatives for grain, developing a marketing plan for crops and livestock, market outlook and the use of AGNET as a

marketing tool. Materials available for agents as teaching aids are a slide-tape set on developing a marketing plan, a teaching guide on cash grain marketing alternatives and current outlook information. Marketing tools available on AGNET are the program for keeping up to date on current supply/demand information, the MARKETCHART program for charting futures market prices and three livestock advisory programs that give monthly advice on the profitability of various marketing/production choices for the beef and pork producers.

Last year county agents presented marketing information in over 100 public meetings, about 300 news columns, 216 radio programs, nine TV shows and assisted people on a consultation basis.



Natural Resources

Building Placement Prime Topic At Farmstead Planning Conference

Every farm has a farmstead. An efficient farmstead is needed along with other efficient farming practices to save time and valuable energy, provide safe working conditions and contribute to a more meaningful farm life.

Building placement can affect snow control, for example, which requires time and fuel to clean away. A planned arrangement for equipment traffic can avoid

farmyard congestion and accidents. Other problems, too, like manure odors, grain handling, visitor parking and farmyard visibility need reckoning with.

These developments were aired at a National Farmstead Engineering Conference sponsored by the American Society of Agricultural Engineers. NDSU agriculture engineers were actively involved in planning and presenting information at this conference.



These photos show the changes on the Vern Triebold farmstead near Oriska, North Dakota, from 1963 (above) to 1978. Note the building additions and shelterbelt growth in the bottom photo.





Sunflower Oil Demonstrations Draw Over 5,000

During the summer of 1980, farmers were experiencing temporary fuel shortages and showing a strong interest in alternate fuels. The Extension Service developed a demonstration program to show the public a method of extracting vegetable oil from sunflower seed, how to filter the foreign material from the oil, and how vegetable oil performed in a diesel engine. A total of 22 programs were presented at Experiment Station field days, county crop tours, seed company programs, agricultural expositions and county fairs. Over 5,000 people attended these demonstration programs.

A CeCoCo "Hander" screw expeller and filter were used to demonstrate the extraction and filtering process. Performance tests were conducted using a AC 7010 diesel tractor rated at 106 PTO HP to show how sunflower oil compared to diesel fuel when burned in an engine. Records were kept on the power output and fuel consumption for both diesel fuel and pure crude sunflower oil during the trials.



Extension Plugs In To Electrification Program

The Cooperative Extension Service has had an agreement with the North Dakota Power Use Council to prepare materials which would help all North Dakotans get the most efficiency from their use of electricity. Two major aspects of this program are the Electric Farm Power Quarterly and Electrical Control Kits.

March 1 marks the 91st issue of the Electric Farm Power Quarterly. Topics of those 91 issues have ranged from livestock building design to the use of small appliances. Some topics have been covered several times, such as standby generators (three times), insulation (four times), and lights for growing plants (three times).

The Quarterly has had five different Extension Agricultural Engineers and 13 graduate assistants as authors since the first issue appeared in 1959. The March 1982 issue was distributed to 84,000 homes. Most of those copies were delivered as part of the Rural Electric magazine with the rest being delivered as part of an electric supplier's newsletter or mailing or through-County Extension offices.

The Electrical Control Kits are used each year by 27 high school vocational agriculture instructors to train 300 to 400 students in the proper use of electrical controls. The controls used in this instruction range from simple light switches to electric motor magnetic starters. Students learn how to hook up motors or lights so that they can be turned on or off by changes in light, humidity,



ty, temperature or how start up can be delayed so that one motor waits until another motor is running before it starts.

These programs are designed to make everyone a little more aware of how important electricity has become to our standard of living and how to live safely with electricity.

Conservation Is Watchword For Energy Extension Service

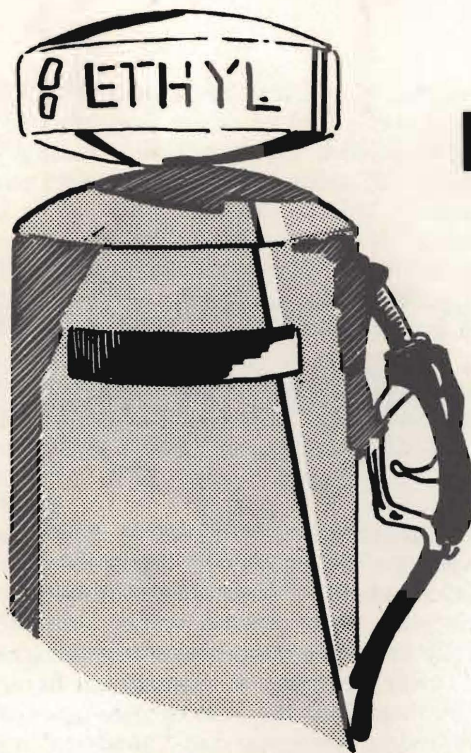
North Dakotans use about 16.5 percent of their energy for heat, 25 percent for transportation. Energy Extension Service programs in 1981 concentrated on ways to conserve energy in these two areas.

Programs included workshops for home builders on superinsulated house construction, a survey of home heating system efficiency, evaluation of alternative energy systems for home heating, dissemination of information on how to control air leakage and indoor pollution, assistance to church leaders in developing plans to reduce church heating costs, and instruction for school district leaders on how to use a bus route analysis

model to redesign school bus routes in order to save fuel.

All county agents have access to energy conservation materials available from Energy Extension, and energy agents are located in Dickinson, Minot, Grand Forks and Fargo.

The Energy Extension Service became part of the Cooperative Extension Service in 1980, with funding provided by the Department of Energy and the Federal Aid Coordinator Office of Energy Management and Conservation programs.



Ethyl Alcohol Good As Alternate Fuel

Ethyl alcohol has received considerable attention as a fuel source for gasoline engines. If a reasonable priced starchy material is available along with a cheap fuel supply, alcohol production looks promising. Alcohol production tends to be difficult, modifications must be made to an engine to efficiently use it and it is expensive.

Two publications are available from the Cooperative Extension Service on alcohol production and use. They are: "Ethyl Alcohol Production" circular AE-698 and "Ethyl Alcohol Use in an Engine" circular AE-699. Contact your County Extension Agent or the Agricultural Engineering Department at North Dakota State University.

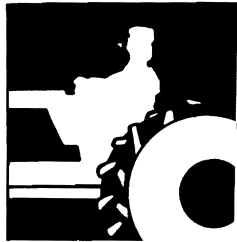
Crop Storing Management May Make Difference Between Profit And Loss

Crop storage management is extremely important in marketing and may make the difference between profit and loss. Information on storage and crop drying has been included in meetings, workshops and a popular circular and is the subject of many questions from individual producers.

Some of the questions producers seek information about include location of dryer systems, sizing dryeration bins and fans, problems encountered when drying sunflower and developing aeration systems. One producer reported that without the storage information he received at an Extension meeting he would have had thousands of dollars in storage loss.

The circular "Grain Drying" answers many of the questions producers ask about drying systems. It received a blue ribbon educational aid award from the American Society of Agricultural Engineers.





Tractor Certification Schools Provide Hands-On Training To Keep Hands On

Farming has always been a family activity. Unfortunately, no family member, age group or sex is immune to a farm accident. As boys and girls reach their early teens, they become more interested in the family operation and their assistance with tasks around the farm is valued quite highly as they grow and develop strength, skills, responsibility and maturity.

Young people under age 16 can work on their home farms without being subject to any form of regulation. According to an amendment of the Fair Labor Standards Act in 1969, however, any 14 or 15-year-old who intends to work on a farm for hire must attend 24 hours of instruction on tractor and machinery maintenance, safe operation and use. These young people must also pass a written examination and demonstrate their ability to safely and properly operate a farm tractor. When the potential farm worker completes these requirements, he or she is issued a certificate allowing that boy or girl to approach a farmer and work for hire. This law was passed to protect young people from doing certain tasks in agriculture that are considered hazardous to persons under 16 years of age. The certificate does not mean the youth has proven his/her proficiency in all facets of tractor and machinery operation. What it does mean is that the boy or girl has received instruction in the safe use of tractors and machinery and has demonstrated the ability to operate a tractor safely. The employer is asked to provide additional instruction on the operation of his particular model of tractor and observe the employee as he or she becomes familiar with it.

Since the beginning of the tractor certification program in 1966, approximately 7000 14 and 15-year-olds

have been certified in North Dakota. The majority of these young people received their instruction at tractor certification schools organized by the Cooperative Extension Service. These schools, held in various locations around the state, consist of three 8-hour days. Using the manual "Safe Operation of Agricultural Equipment," instruction is given in the form of slide-tape sets, films, demonstrations, discussion and "hands-on" operating of farm tractors. Young people can also receive tractor certification through the 4-H program. One of the projects available for members is the tractor project. If the child completes the first, second and third year manuals, passes the written test and demonstrates the ability to operate a farm tractor safely, he or she is qualified to be employed on a farm. The child must also be a 4-H member, 14 years of age or older and familiar with the normal working hazards in agriculture.

North Dakota's youth is an extremely valuable resource and they need the opportunity to grow and develop in their skills and responsibility. Statistics show, however, that tractor operators under 20 years of age are particularly prone to accidents. For example, if we look closely at tractor overturns (North Dakota's number one cause of farm fatality), tractor operators under 20 years of age make up 25 percent of the victims. This information points to a lack of experience and instruction of the young operators.

All young farm workers and tractor operators are encouraged to attend the tractor schools and receive instruction and certification. Many parents send their teenagers to receive the training even though they will be working on their home farm.

Farm Accident Rescue: A "Must" For Rural Ambulance Squads

In 1972, a National EMT (Emergency Medical Technician) program was begun to insure that ambulance squad personnel had the proper training to perform emergency care. North Dakota, using the instructional material provided by the National EMT Association, developed a state EMT-ECT program as did the other states. The EMT program provides training in all facets of initial emergency care such as: bleeding, shock, broken bones, CPR, emergency childbirth, drugs, poisons, auto extrication, etc. To become a registered EMT (National) and/or ECT (state), an interested individual must attend 125 hours of instruction, pass both a written test and a practical test and acquire 10 hours of experience in both the emergency room at a hospital and riding along in an ambulance. In order to remain registered as an EMT-ECT, a squad member must renew his or her CPR certification annually and attend 30 hours of additional instruction every two years.

Many of North Dakota's ambulance squads are lo-

cated in rural areas and virtually all of them could be called upon to respond to a farm accident. The majority of squad members have little or no experience with farm machinery or have forgotten much of what they learned as a youth on the farm. Because of this void in the training of ambulance squad personnel, there has been a great deal of interest in the farm accident rescue program.

The idea of working with ambulance squads regarding farm accidents first began in Nebraska. The Extension farm safety specialist at the University of Nebraska began to research information that ambulance personnel should know, such as types of injuries to expect with various pieces of machinery, methods of extricating the victim, hazards the rescuers should be aware of, etc. He got the "Farm Accident Rescue" program going in Nebraska and began to branch out, assisting other states in establishing similar programs.



Tractor accidents are a major concern of Extension safety programs.

In February of 1979, he was asked to present a training program for North Dakota EMT's and ECT's at the Governor's Safety Seminar in Fargo. There was tremendous interest as over 80 EMT's and ECT's attended the session. The training program was repeated at the 1980 and 1981 Governor's Safety Seminars.

Many ambulance squad members work during the day, which makes it difficult to make it to the Governor's Safety Seminar. Several ambulance squads began to request programs in their communities in the evening. Since February of 1979, approximately 1,000 ambulance squad members in some 60 communities have received training in farm accident rescue. The hours of instruction these people receive are good toward the 30 hours of instruction they need in order to be recertified each two years.

One of the problems encountered with farm accidents

is the response time between when the call is received and the ambulance arrives on the scene. Many squads are attempting to combat this problem by establishing teams of "first responders." First responders are citizens trained in first aid who may be living only 2-3 miles from the scene of the accident compared with 30-40 miles that the ambulance must travel. Many of these people have attended farm accident rescue programs as well.

The typical program format consists of 1½-2 hours of classroom instruction using films, slide presentations, demonstrations and discussion. The classroom portion of the program is followed by some "hands-on" experience with actual farm machinery. A booklet, "Farm Accident Rescue," is available through the County Extension Offices and has been found very useful for ambulance squads, fire departments, and rescue squads as well as the general public.

1980 Farm Accident Survey

Average N.D. Farm Accident Costs \$486

There are farm accidents in every farming community, and most people have their own ideas of what piece of machinery is the most dangerous. There are various sources of information about farm accidents — newspaper, radio, word of mouth, etc. The majority of farm accidents reported are serious or fatal. Quite often, very little is known about the weather conditions, events leading up to the accident — essentially, the details about what happened.

Statistics provided by the National Safety Council and in our own state through data collected from death certificates have pointed out that agricultural accidents are a serious problem. The National Safety Council found agriculture to be the most hazardous occupation in 1980. This information was reached by analyzing death certificates from all work related fatalities. North Dakota death certificates indicated that more people were killed in agriculture-related accidents than all other work-related accidents combined. Information compiled through newspaper clippings indicate that non-fatal accidents over the state are far more common than many people realize.

In order to compile information regarding who the accident happens to, where on the farm the accident occurs, which machine or task is more prone to accidents

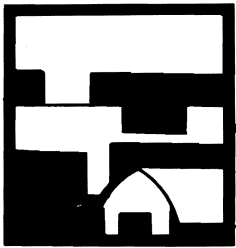
and what an accident costs the farm family, a plan was laid out to conduct farm accident surveys in each state. Information from these surveys is being used for educational programs and to create and establish an awareness of the hazards in agriculture.

The North Dakota Farm Accident Survey got underway October 1, 1979. Fourteen counties were randomly selected to represent the agriculture of the entire state. Within these 14 counties, volunteers were asked to choose five farms in their neighborhood and keep records of any farm accidents that occurred in a one-year period. Volunteers were called to training meetings within their counties and given a packet of forms to record facts, regarding the accidents. Only accidents that required medical attention or loss of ½ day time or more were recorded. Over the one-year survey period, 443 farms were contacted and accidents recorded. Some of the information derived from this study includes:

—The average farm accident costed \$486.88 in medical bills.

—One farm out of every 7.5 suffered a lost time accident and/or an accident requiring medical attention.

—49% of the accidents occurred while routine chores and/or machinery maintenance were being performed.



Community Resource Development

A Good Place To Live And Do Business Sums Up 1980 Killdeer Consumer Survey

"There's a lot of unity and pride in Killdeer and, for the most part, it's a pretty good place to live and do business." This statement summarizes conclusions drawn from a consumer survey conducted by the Extension Service in Early December of 1980.

The Dunn County Agent and Energy Area Extension Resource Development Agent initiated the idea for the survey which was meant to facilitate more effective communication between local businessmen and area consumers. This seldom happens in a small community where close friends or acquaintances are reluctant to pass on suggestions for improvement.

An Extension economist in community development served as the disinterested third person in the information transfer process. Taped interviews were conducted with 40 Killdeer area residents who were split into four groups: (1) long-term residents, (2) short-term residents, (3) ranch wives, and (4) ranchers. All persons interviewed remained anonymous and were completely open in

relating the strengths and weaknesses of not only individual businesses but of the community as a whole.

General comments about the community were related to the Town Criers, an organization of community businessmen. Also, personal visits were made with 34 Killdeer business owners or managers and the actual comments made about that particular business were discussed.

One immediate benefit of the process was that the long-term residents were impressed by the businessmen asking for constructive feed-back about their operations. Comments obtained from businessmen after the report-back session included, "It provided some good insight into what our customers are thinking," and, "It really opened some eyes." Evaluation of the process indicated a number of businesses improved their customer relations, rearranged their store to improve shopping conditions, and made other improvements to better serve their customers.

The Community Attitude Survey: An Instrument For Community Consensus

Extension community development staff are concerned about the wishes of the community for planning development. There are many **possible** economic and social development projects, but some may clash with community groups or community values in general.

One method of assessing community values and consensus on development goals is the community attitude survey. This is a process of community education and group leadership mobilization. A steering committee of leaders from a broad spectrum of organizations and clubs is convened by the county agent. Extension specialists explain the purpose and process of community attitude surveys, and small workgroups designate community-wide problems and intended goals. Survey design is built by the group. Among the components of each survey are: community image, community service and facilities, retail trade patterns, attitudes toward growth and development.

Community leaders are responsible for printing costs and delivery and pick-up of the surveys. The county agent prepares a sample of farmers for a mail survey. The AGNET computer system is used because the results can be analyzed in a group teaching context later. The results are given to community leaders six to eight weeks later. Groups are organized into goal areas and are provided further computer information. The process benefits the community by providing reliable information quickly.

The household response rate is between 62 and 84 percent for the 11 communities surveyed thus far. The survey aids the construction of needed community services and capacity building for various size communities around the state and permits community leaders to view first-hand the adaptability of the AGNET system to community issues.

Extension Offers Econ Development Course To N.D. Communities

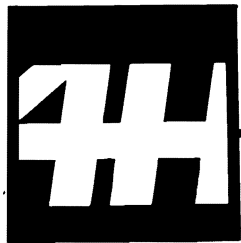
The Cooperative Extension Service has developed a Community Economic Development Course for business and community leaders, local development corporation members and interested residents. The course is made available to communities requesting the course and showing a genuine interest and concern for achieving their development objectives.

County agents work with community sponsoring organizations in arranging for the course to focus on areas of greatest concern in community and economic development.

Resource staff for the course involve Extension economists, an Extension sociologist and an area development agent. Also, depending on community interests, there may be staff from other sources, such as the State Economic Development Commission, the Small Business Administration, and power companies.

Thirty courses have been presented during the past five years with five courses during the past year at Center, Mott, Gladstone, Almont and Jud. Three sessions per course are generally held with options for more sessions if requested by the local group. The objectives of the course are to help local communities improve their job and income opportunities, strengthen their problem-solving capabilities, and enhance their services and facilities. Socioeconomic development opportunities are identified through presentations, group discussions during the course, and by surveys.

Many of the communities in which courses have been held have experienced economic, social and cultural improvements. Local development corporations have been organized or rejuvenated. Added business and service firms have been studied. Recreational programs and facilities have been started. Besides community improvements, there has been a renewed community spirit of pride, cooperation, and accomplishments.



4-H

The 4-H Mission: Building A Future

4-H is working to build the future of North Dakota by educating the youth of today. In the past the 4-H educational program primarily served farm and rural youth. Now it is expanding to reach youth regardless of their place of residence — and regardless of their race, color or economic status. Today about 39 percent of 4-H youth live on farms, 19 percent in small towns, 42 percent in larger towns and cities.

Extension's youth development program emphasizes providing activities that build character and enrich lives. 4-H young people learn by doing — by doing projects and giving demonstrations, by camping out and traveling abroad, by participating in conferences and attending seminars, by hosting foreign visitors and undertaking community improvement projects.

These and other educational activities are planned and supervised in each county by volunteer 4-H advisory committees, and are carried out in large part by volunteer leaders. In 1981 more than 3,500 volunteers provided leadership for local 4-H groups in North

Dakota. Many volunteers received extensive training to help them work effectively with youth. Some attended regional and national leadership forums and then returned to teach other volunteers what they'd learned by conducting their own state and county leadership workshops. Some received training from county and state Extension staff.

Adult volunteers not only served as club leaders, but helped Community Resource Development and Urban program assistants carry out short-term 4-H programs in rural communities and urban areas of North Dakota.

Youth volunteers also helped keep 4-H programs running smoothly. Sixty teenage youth known as 4-H Ambassadors comprised a statewide advisory group which helped plan and carry out 4-H programs. Among other things, 4-H Ambassadors conducted conferences and leadership retreats, assisted in publicizing 4-H activities at the North Dakota State Fair, and made appearances to promote 4-H programs and increase 4-H participation.

4-H Programs Combine Tradition And Innovation

Traditionally, 4-H members belonged to more or less permanent community clubs and did long-term projects which often were brought to conclusion at the county or state fair. That tradition continues: last year more than 10,000 young North Dakotans were members of 4-H community clubs. But an even larger number of young people — 10,881 — participated in short-term 4-H programs.

Community Resource Development is one of several 4-H programs which offer short-term learning experiences for youth. Each summer college students are hired, trained and sent to small towns throughout the state where they help local youngsters design and carry out projects to improve their local communities — projects such as town clean-ups, renovation and painting of public buildings, park development, and nursing home visitation. Last year 22 North Dakota Communities had Community Resource Development programs.

Urban 4-H programs also offer short-term learning experiences for young people. They are conducted year round by trained 4-H paraprofessionals in Fargo, Mandan, Grand Forks, Bismarck, Minot and Dickinson. Urban programs were begun eight years ago. Since then the number of youth participating in them has more than tripled, to 9,680 in 1981. As part of last year's Urban 4-H program, fourth graders in Minot participated in a two-part energy conservation presentation, Dickinson youth made solar hot dog cookers and prepared their noon lunch in order to learn about energy, and Grand Forks youth participated in a seed-to-jar garden program in which they planted seeds in a greenhouse, prepared the seedlings for transplanting, and then transplanted, fertilized, cultivated, watered, debugged and harvested their produce. In addition, Bismarck youth from a school for the handicapped and from the United Tribes Education Training Center made granola bars and other snack foods during a series of nutrition lessons designed to teach them proper eating habits.

4-H Expanded Food-Nutrition Education Programs are primarily intended to teach proper nutrition and eating habits to youth from low-income families. Last year in North Dakota these programs reached 2,690 young people.

4-H intercultural programs promote understanding among people of different cultures and provide opportunities for young people and their families to learn about lifestyles different from their own. Last year as part of the 4-H Youth Exchange program, 25 North Dakota youth spent a month in the homes of 4-H families in Norway. Five lived for a month with families in Japan. One lived six months with families in the



Youth in the 4-H Urban Gardening program reap the vegetables of their labor on a garden plot in Fargo.

Netherlands. And one traveled to Thailand where he will spend a year and a half helping Thais develop a youth program similar to 4-H.

In return, during 1981 North Dakota 4-H families hosted 24 young people from Japan, Thailand, the United Kingdom, Germany and the Philippines.

These intercultural programs do not provide educational experiences only for the participants. While living abroad, North Dakota exchangees sent home newsletters which were distributed to North Dakota Extension Homemakers Clubs, and upon returning to the state IFYE delegates spoke to more than 11,300 North Dakotans about their foreign experiences.

4-H projects are designed to teach a wide variety of living skills, but many emphasize marketable job skills — especially skills related to agriculture. 4-H encourages young people to identify career interests and to

learn job-seeking skills: each year a three-day Career Clue-In is held in Bismarck, during which 4-H'ers visit with and observe workers on the job, and practice job-seeking skills such as responding to an interviewer. A computer program called JOBSEARCH helps hundreds of 4-H youth identify careers which relate to their own particular interests and abilities. Three 4-H'ers learn about twelve food-related careers in Minneapolis on a tour sponsored by the North Dakota Wheat Commission each year. And last year 4-H'ers in Braddock and Hazelton followed close on the heels of local Linton businessmen for one whole day in order to learn what those businessmen's jobs really involved.

4-H projects in foods and nutrition attracted 23 percent more participants in 1981 than in 1979. The number of boys nearly tripled, jumping from 593 to 1,529. Special emphasis is being placed on offering foods and nutrition projects with interesting and colorful formats. Last year a new project on outdoor eating drew 700 participants. This year two new projects will be offered, one on microwave cookery called "The Mystery of Microwave" and another on wild game cookery called "Eating from Field and Stream." Future 4-H programs in foods and nutrition will stress the relationship of eating and fitness to well-being.

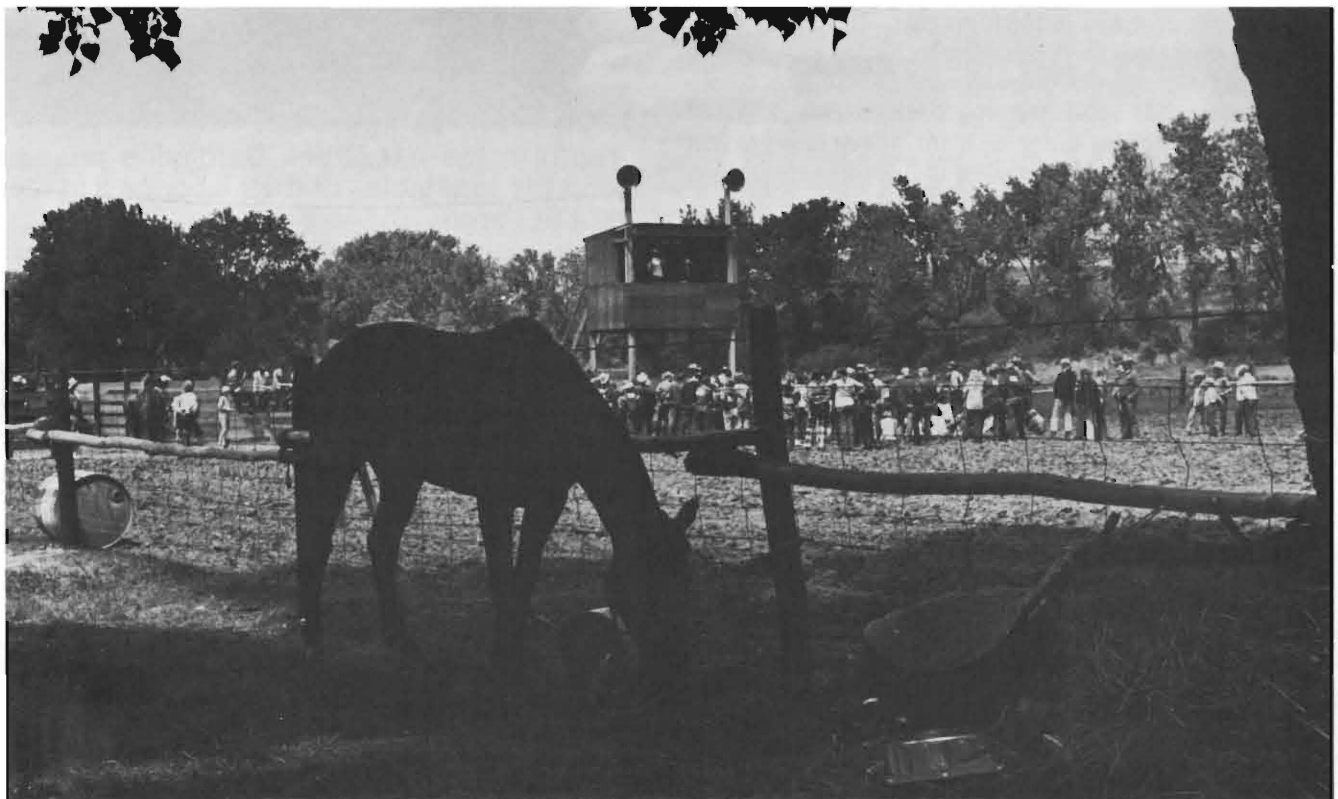
All 4-H projects teach youth to communicate effectively. In fact, communicating may be one of the most important skills young people learn in 4-H — a skill they will use all their lives. 4-H'ers share what they learn in their projects by speaking to their own clubs and to a wide variety of other audiences, from passersby at the

state fair to panels of judges. Last year 700 4-H youth participated in county, district and state public speaking contests sponsored by the North Dakota Rural Electric Cooperatives and five commodity groups and businesses. More than 3000 4-H youth communicated information on a variety of topics in county, district and state demonstration contests. More than 2000 participated in agricultural judging activities in livestock, crops, land, dairy and horse, in which they ranked items from best to poorest and then supported their rankings with oral reasons. About 1800 4-H'ers presented and explained their food, clothing and home living projects in living exhibits at county activities or at the state fair.

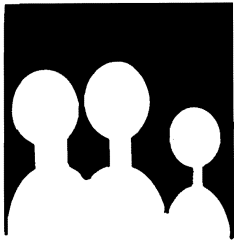
To teach is to learn. 4-H youth are working to build the future of North Dakota by educating themselves, and others.

1981 4-H Project Enrollment

Project area	Number Enrolled
Individual and Family Resources	17,917
Health, Personal Development, Relationships	11,682
Leisure Education and Cultural Arts	10,808
Animals and Poultry	8,238
Plants and Soils	7,102
Energy, Machines and Equipment	6,881
Communications, Arts and Sciences	5,213
Community Development, Service, Government	5,189
Ecology, Natural Resources	1,204
Introductory	926
Cultural Understanding and Exchanges	583
Economics, Jobs and Careers	402



4-H offers concentrated learning experiences in a variety of specialty camps — horse camp, art camp, wildlife camp, livestock camp and intercultural camp.



Home Economics

Home Economics Committed To Helping North Dakotans Deal With Everyday Living

The Home Economics unit is committed to helping North Dakotans deal with everyday living by providing modern educational opportunities.

Programs are designed to enhance the well-being of families and to provide for optimum development of every family member. County, area and state staff teach in the fields of food, nutrition, health, clothing, textiles, cultural arts, family resource management, home furnishings, household equipment and human relations.

Two important audiences for Extension Home Economics educational efforts are families in the Expanded Food and Nutrition Education Program and members of Extension Homemakers'. The Expanded Food and Nutrition Education Program is designed to provide information about food and nutrition to families and individuals with less means, especially young families. Program assistants work with families on a one-to-one basis or in small groups in Cass, Grand Forks, Burleigh, Morton and Ward Counties, and on

Turtle Mountain, Standing Rock, Fort Berthold and Fort Totten Indian Reservations.

Members of Extension Homemakers' clubs aim to improve their family and community life and to enhance their personal development and personal leadership skills by learning about family living and home economics. Extension Homemakers are organized on local, county and state levels.

One of the four statewide Extension Homemakers' club programs for 1980 and 1981 was designed to acquaint club members with their basic legal rights. Extension home economists and home economics special instructors provided more than a thousand club leaders with information on legal terms, on U.S. and North Dakota court systems, and on court case histories relating to education, employment, marriage, family, wills, estates and trust rights. Club leaders, in turn, shared this information with more than 22,000 club members and friends.

Good Nutrition And Dietary Habits Are Basic To Good Health

Good nutrition and dietary habits are basic to good health. One obligation of Extension is to improve the nutrition and quality of diet of North Dakotans by offering them accurate information about nutrition and diet.

Last year Extension helped people obtain an adequate, nutritious diet through a statewide Extension Homemakers' club program called *Taming the Food Dollar*. This program taught audiences how to develop a food spending plan, how to apply nutrition knowledge to meal planning, how to use grading and labeling information, how to identify quality and freshness of food, and how to store food safely at home.

A workshop on the principles of weight control was conducted with a wide variety of audiences, including high school and college students, senior citizens, handicapped people, Extension Homemakers, young adults, diet club members, and low income and minority groups.

Programs were presented using an AGNET computer program called DIETCHECK to assist people in analyzing their individual dietary patterns and to aid them in making positive changes.

Finally, 4-H leaders taught boys and girls about food, nutrition and health, and the boys and girls in turn taught others by giving demonstrations and speeches, and by making exhibits.

Current information on nutrition and diet was disseminated to North Dakotans by the same wide variety of means used to disseminate other Extension information, including newspaper articles, fact sheets, television and radio programs, displays, a consumer answering service, a self-study packet loan library, illustrated lectures, films, book displays, slide/tape sets and newsletters.

Variety Is Spice Of Writing For Home Economics Newsletters

State home economics specialists write a variety of newsletters for county staff, area staff and the general public. *Advice to Consumers*, for instance, is a monthly newsletter for staff and the general public. It contains articles on subjects relating to housing, home furnishing, household equipment, finances, household management and laws affecting consumers. *Young Adults*, a bimonthly newsletter for adults under 35, deals with family life, food, nutrition, clothing, and family resource management.

People, a bimonthly newsletter for staff and public, contains articles on child-parent relationships, husband-

wife relationships, child development, understanding others, and personal development. *Extension Home Economics* is a quarterly newsletter for graduate home economists that focuses on current research findings in home economics. *Lab to Kitchen* and *Textile Tidbits* are newsletters for county and area staff to assist them in keeping up to date.

North Dakotans can receive any newsletters written for the general public by contacting a County Extension Office and requesting to be put on the appropriate mailing list.

Interest In Food Preservation Makes Extension A "Can-Do" Business

North Dakota is not only the Peace Garden State, but very much a gardening state — and a canning state. A 1977 survey indicated that more than 65 percent of North Dakota homemakers had done at least some home canning the previous year, and that almost 30 percent planned to do more canning in the future. Last year 73.1 percent of North Dakota families raised gardens, almost 5,000 youth participated in gardening projects sponsored by Extension, and nearly 1,000 4-H'ers enrolled in food preservation projects.

Very early in its history the Cooperative Extension Service was looked to as the innovator and authority in food preservation. Today it remains one of the major

sources of reliable information in this field. Each county office manages its own food preservation program, provides a pressure canner gauge testing service, and has fact sheets for public distribution. Approximately 8,000 individual requests for food preservation information were directed to North Dakota County Extension Offices in 1981.

A Master Canner program, patterned after the successful Extension Master Gardener program, will be piloted in 1983. It will provide in-depth training in food preservation to leaders, who in turn will assist Extension county staff in answering the public's questions concerning food preservation.

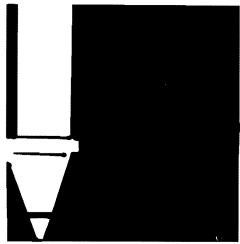


Clothing specialists across the North Central Region (Ohio, Michigan, Indiana, Illinois, Wisconsin, Missouri, Iowa, Minnesota, Kansas, Nebraska and the Dakotas) felt the need for a new publication which would describe fabric finishes, their use and care. North Dakota Extension filled that need by producing NCR Publication 150, "Fabric Finishes." It describes each of

Publication Tells Everything About Fabric Finishes

eighteen major classes of fabric finishes on the market today — antibacterial, antistatic, water repellent, durable press, soil releasing, and so forth — and how to care for each.

This publication is one of three NDSU Extension publications distributed to wider audiences through the North Central Regional Publications program. Another, produced by the Home Economics department in cooperation with the Extension Agricultural Engineering department, tells how to prepare and equip for survival in a snowstorm when stalled on the open road. A third North Central Regional publication, produced by the Extension Agronomy department, describes how to grow flax.



Agricultural Communication

Agricultural Communication: Reaching The Public Every Which Way We Can

The Agricultural Communication unit last year printed and distributed more than 900 publications, produced almost 150 television news clips and program spot announcements, supplied 30 North Dakota and Minnesota radio stations with weekly taped agricultural interviews, prepared about 15 news releases per week for newspapers and magazines and other periodicals, and twice every day phoned grain market reports to more than 30 radio stations.

The most dynamic way to teach people is still face-to-face. But moving teachers around the state to teach people in this way is expensive and often impractical. This is why Extension communicators are working to find new, effective and economical ways of moving information to North Dakotans through mass media. Between October 1980 and September 1981, for instance, Extension produced television news stories which reached 5 million people at an estimated cost per viewer of 22 hundredths of a cent. Many of the news stories appearing in weekly agricultural newspapers which have sprung up in such towns as Washburn, Jamestown, and Wahpeton, are provided by the Ag Communication Department.

Computer technology is revolutionizing the communications industry and will continue to do so for some years. The Ag Communication unit intends to be in the forefront of that revolution. Early this year it piloted dissemination of weekly news releases to County Extension Offices via the AGNET computer system. For the last several months it has been sending electronic mail to various USDA offices, and has been receiving early morning updates of agricultural news from the USDA information office in Washington, D.C., by electronic mail.

As more and more North Dakota farmers and homemakers purchase equipment and begin accessing information through their home television sets, the Ag Communication unit will be prepared to provide them access to same NDSU Extension news stories available in newspapers and on the radio.

Ag Communication staff are not only communicators, but trainers. They help Extension specialists, administrators and county agents do a professional job of communicating to the people of the state by training, advising and assisting them in the use of a wide range of media, including radio and television, publication, photographs, overhead transparencies, a media library of slide/tape sets and videotapes, educational telephone, newspapers, popular magazines and scholarly journals.





Insect Pest Management For Sunflower

Prepared and Edited by:

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Insect Pest Management For Sunflower Bulletin Available

One of the important needs for sunflower producers, county agents, sunflower seed company personnel, crop consulting firms and others associated with sunflower production is a single publication providing current information on economic insects affecting sunflower in the upper midwest. With this in mind, a comprehensive bulletin entitled "Insect Pest Management For Sunflower" was developed in 1981. This publication is 23 pages long and incorporates information on the principles of pest management. Each of the significant injurious insects of sunflower is described and shown pictorially. The biology, life cycle, economic threshold and scouting technique for each insect is discussed in detail. Since field investigation and/or controls are critical at certain stages of sunflower development for several of the sunflower insect species, a section dealing with the stages of sunflower growth and development is included. In addition, several pages are devoted to measures that beekeepers, aerial applicators and farmers can observe to avoid bee kill when insecticide application to sunflower in bloom becomes necessary.

The IPM For Sunflower bulletin has met with enthusiastic approval. A number of seed companies and crop consulting firms have ordered the publication in quantities ranging from 100 to 300 clients and customers.

About Our Cover

Sitting at the kitchen table with a cup of coffee has been one way to do Extension work for as long as there have been county agents. Today, however, an AGNET computer terminal is as likely to be a part of the conversation as lists of fertilizer recommendations or crop varieties. The AGNET system gives access to a wide range of computer programs, from formulating least-cost livestock rations to making farm management decisions. AGNET is also being used as a communication tool that can provide county officers with up-to-the-minute information electronically.



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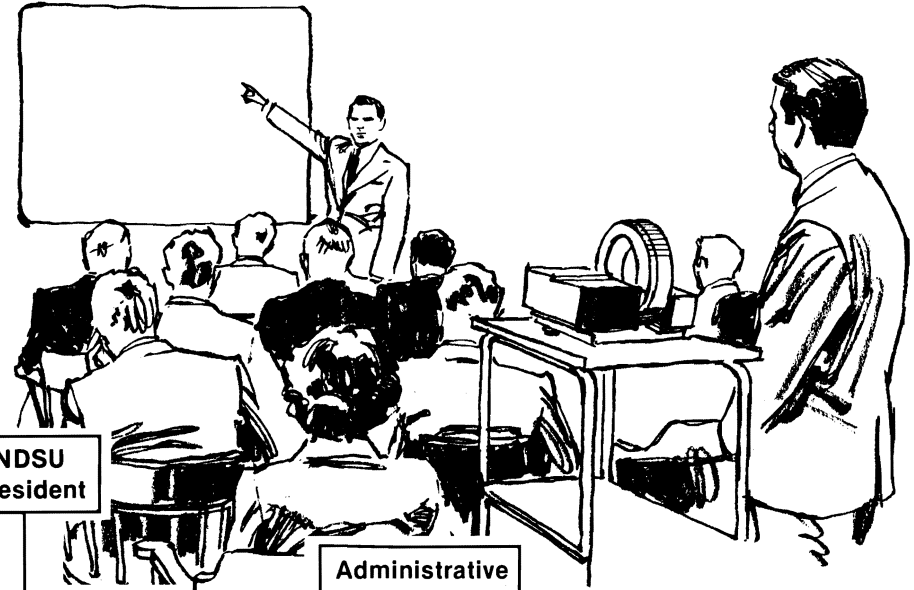
*Denotes County Extension Chairman

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Organizational Structure Cooperative Extension Service North Dakota State University

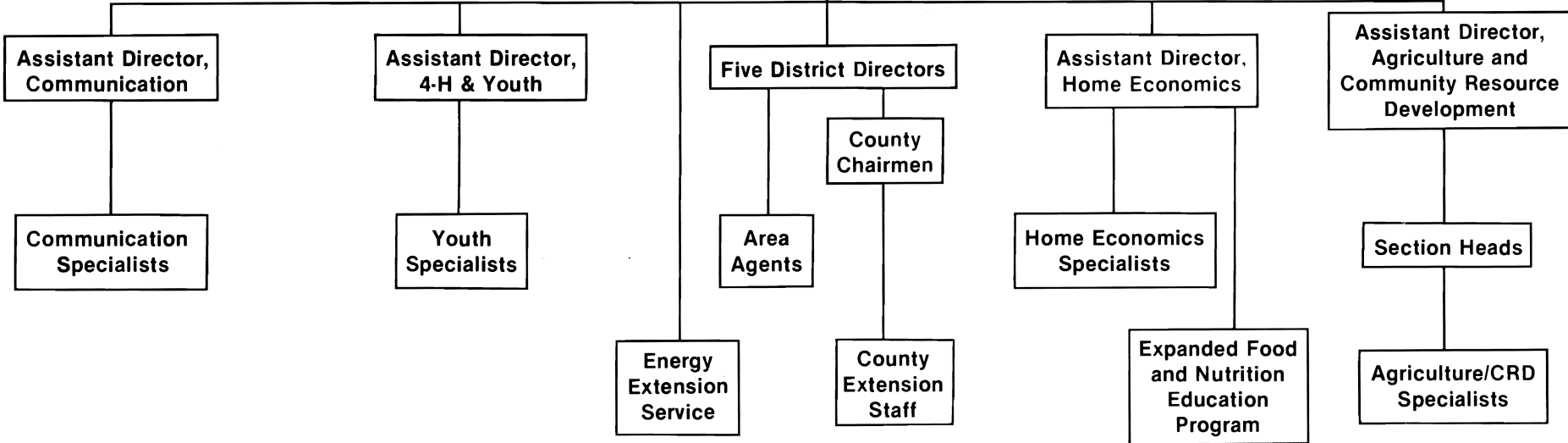


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