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Dividends from Your Investment: 1964 Annual Report

Cooperative Extension Service
South Dakota State University

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1964 ANNUAL REPORT

SOUTH DAKOTA
STATE UNIVERSITY

JUL 13 1967

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COOPERATIVE EXTENSION SERVICE

dividends
from
your
investment

South Dakota State University at Brookings

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1964 annual report

SPECIAL SERIES #1

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YOU and the cooperative extension service

Directly or indirectly, whether you realize it or not, the Cooperative Extension Service had an effect on YOU in 1964.

And that's true whether you live in a city, in an urban area, or in a rural district.

It goes the other way too. YOU have had an effect on Extension—what YOU want, what YOU need, and what YOU do influences to a great extent what Extension is and does.

Extension enters into the daily lives of all people in South Dakota not only by what it does to continually build the state's major industry—agriculture—but also from its work in home economics, youth activities, and area-county-community development. Its many different *educational* programs, affecting so many, can and have had a tremendous impact on economic and general welfare of every South Dakota citizen.

Educational programs? That's right. The Extension Service is the informal off-campus educational arm of South Dakota State University and the United States Department of Agriculture. Your land-grant university is obligated to do more than just a good job of training undergraduate and graduate students enrolled on-campus at Brookings. South Dakota State University is also committed by law, tradition, and necessity to conduct both research and extension programs.

Research Put to Work

The research programs provide new knowledge. The extension programs acquaint South Dakotans with this new knowledge. But transmitting this knowledge and information to the people, important as it is, is only part of the Extension job. People are not much interested in new information as such. People are interested in solving problems and achieving goals. This is where mere *transmission* of information is carried a step further by Extension. It organizes information around problems and goals of people, helps individuals and groups to adapt generalized information to their own situations, and motivates them to act on that information. Even at this point of motivation Extension's job is far from finished. Extension through its direct work with people probably more than any other organization learns of problems confronting South Dakotans—problems which demand NEW research, perhaps an entirely different approach. Then the complete Extension process of research-to-people-to-action starts all over again.

Extension education snowballs to touch many sectors, some widely removed from original objectives.

One example: as a result of educational work on livestock feeding, interest has increased in use of high roughage rations. This creates attention to new silos, feed grain storage structures, feedlot arrangements, and feed handling equipment. An estimated 600 new upright and 400 new trench or bunker silos were built in South Dakota in 1964. Those directly or indirectly involved in planning, manufacture, sales, transportation and construction of just 600 new upright silos constitute an impressive number of people who ultimately benefit from an Extension educational program.

In addition to the Experiment Station at State University, Extension if necessary can draw on Federal research agencies of USDA for information. Specialists in various fields usually assemble and organize this information and train county personnel. The county Extension agents—agricultural, home economic, and 4-H—are the key people who actually disseminate most of this information so that it is of value at the user level. The Extension agent working in YOUR county is a staff member of South Dakota State University. In effect, every county in the state has a branch of SDSU.

Since Extension was authorized by the State Legislature a half century ago, great changes have occurred in communities, counties, the state, the nation, and the world. Agriculture has become more specialized and more complex. Extension has kept pace with rapidly-developing changes.

The commercial farm, important as it is in food production, must be supported by industries and agencies that provide inputs essential to successful farm operation. Similarly many businesses and services are required to take the raw agricultural product from production through processing, marketing and distribution channels, and ultimately to the consumer. Within this complicated framework YOU are a part—regardless of where you come from.

Consumer and Marketing

The sharp line between town and country in South Dakota, as elsewhere, is being eliminated—the whole new field of agribusiness must now be considered. Service to farm and ranch families still remains a major effort of Extension in South Dakota. But marketing and consumer education is receiving increased attention. Youth work is meeting a need in the towns and cities of the state. As citizens become more interested in public issues, Extension is helping communities to organize to attack problems of interest and concern to the total citizenry. Schools, taxes, water, health . . . problems are increasing in number and complexity—and solving many of them

as well as attaining goals is of benefit to all of us.

How does Extension go about this important job of education? Rarely is any one teaching or communications method used alone. Extension makes use of every possible way to get information to people of the state. The demonstration, on which Extension work was originally based, is still the keystone to the structure. A person who does something well shows others how-to-do-it. Newspapers, magazines, special brief-and-to-the-point publications, meetings, farm visits, office calls, television, radio, traveling exhibits, the full range of visual aids such as slides, movies, flannelgraphs, projectors . . . these are only some of the tools used by Extension for teaching.

More than a million copies of Extension publications (mostly of the Fact Sheet type) were processed during 1964. Included were 123 new publications and 66 older ones reprinted to fill demands or revised to incorporate up-to-date information.

Near As Your Telephone

Extension workers made 306,225 individual, personal contacts in 1964. The fact that Extension help is only as far away as your telephone is illustrated by the 140,116 telephone calls made by South Dakotans in 1964 to get information from Extension workers. Almost a million persons — 983,887 — attended the 16,256 educational meetings participated in by Extension workers.

Training of local leaders, the unpaid farsighted men and women to whom is closely tied the progress of Extension, is all-important to make the educational program effective. Nearly 53,000 persons attended Extension training meetings for local leaders. These local leaders then went home to their communities and increased the educational impact even more by conducting meetings of their own attended by 358,386 people.

South Dakota's 4-H club enrollment in 1964 barely missed the 20,000-mark and established a new high. More and more you will find that the leaders of tomorrow received a lot of their early training as 4-H club members.

Home improvement and family living are emphasized by Extension Home Economic activities. More than 16,000 women belong to the 1,217 community Home Economics clubs.

During its first half century, South Dakota Extension has carved an important niche in South Dakota development by employing the Federal-State-County concept of mutual support and assistance. This report barely touches on some of the examples and areas in which Extension work in 1964 involved YOU.

production management, natural resources

ANIMAL SCIENCE

CATTLE

4,074,000 head, a record number, on farms on January 1, 1964. (More than 3,000,000 were beef cattle.)

Outlook for continued increase in beef cattle numbers emphasizes need for proper use of pastures. Condition of native pastures, one of South Dakota's main natural resources, is being seriously depleted by improper management and overgrazing.

Feedlot operators are expanding. Many 50-100 head feedlots have grown to 200-300 head operations. Equipment and mechanization, although costing more, permits—probably necessitates—larger scale operation to reduce cost per unit.

Extension workers are meeting a demand for reliable information on feeding and management, housing, feedlot arrangement, feed storage, feedlot equipment, building sanitation, herd improvement, and marketing. One example of combining several of these demands is the development of data showing that when cattle are fed to excessively heavy weights (beyond 1,100 pounds) feed requirements and costs mount considerably for each additional 100 pounds gain.

A study of grass tetany in cooperation with ranchers provided insight into possible controls for this disease which is of concern to West River producers. More detailed studies continue but from two years of observations incidence of the disease was considerably less in groups of cattle fed supplemental magnesium and calcium than in groups without the supplement. Because of the nature of grass tetany and the fact little is known about it, control in range herds is difficult.

Marked enthusiasm was noted for automated feed handling equipment as a result of demonstrations with a model of a time-run, grinding-handling system to produce and deliver the desired ration to the feedbunk. These systems of feed handling, flexible enough to be "tailored" to individual ranch or farm situations, are a development of Experiment Station research at South Dakota State University.

"Carrier animal" disease problems—anaplasmosis is one—were brought to the attention of producers and animal health authorities. Imports of carrier animals to South Dakota have resulted in losses from certain diseases. Neighboring states have survey results indicating up to 17% of cattle may be carriers.

Weaning weights of more than 17,000 calves were obtained in beef performance testing programs in which 380 producers took part. One hundred twenty-three purebred producers completed tests on 4,751 calves, 1,078 bulls, and 486 heifers.

Extension assistance on livestock problems is not limited to farmer-rancher contacts. Financial agencies, power suppliers, farm structure and equipment representatives, and manufacturers are all a part of the Extension approach and often are called upon for assistance and cooperation.

Meetings in 1964 included:

15 Fall Livestock Outlook and Cattle Feeding meetings, eastern half of state, attendance at each averaged 77 persons.

7 West River Beef Field Days, attendance totaled 260 persons.

Sheltered feeding — a South Dakota trend.



Beef nutrition school for workers at Newell Field Station.

22 county agents completed beef production training workshop for developing educational programs based on latest research. (For example: one county agent through cooperation of the county Livestock Improvement Association held three to four meetings on beef cattle feeding and management at seven places in his county. Attendance was 15-25 producers for all lessons at each of the seven locations.)

Feedlot Planning Conference with attendance of 210 farmer-producers and financial representatives. 8 farm tours.

SWINE

All hogs on farms December 1, 1964 totaled 1,794,000. South Dakota ranks ninth nationally in hog numbers.

Today the farmer is looking at his swine enterprise as a major source of farm income, or at least large enough to be efficient. A farm with 20 to 40 sows farrowing twice a year is not uncommon. Projected indications are that South Dakota farmers will need to produce another million head of hogs annually during the next 10 years making total yearly production about 4 million. Present annual cash farm income in South Dakota from hogs is more than \$100 million.

In addition to management and housing problems, Extension workers are being called upon for information on proper use of feed additives, pig losses between farrowing and marketing, excessive losses from parasites and diseases, and developing meat type hogs.

Considerable progress in development of meat type hogs resulted from breeding and selection programs. During 1964 a total of 51 breeders followed a testing program which included breed certification, testing station entries, and carcass evaluation.

If an Extension-operated Ultrasonic Animal Tester machine proves satisfactory and demand is great enough it will be used for regular testing work in the field. The machine, used to determine loin eye area in live animals, would be of greatest value in obtaining data for selecting breeding gilts.

Extension gave direct assistance to the South Dakota Swine Evaluation Station where two groups of boars are tested each year and more than 1,000 have been tested since 1958. Main value of work by the station is in calling producers' attention to data which demonstrate which genetic and environmental differences are most important to producers.

Swine building and equipment facilities, both new and remodeled, were planned in direct coopera-



Farrowing crate.

tion with 64 individual farmers. County agent and indirect specialist planning help was used in new and remodeled swine facilities on an estimated 300 other farms.

Hog cholera eradication continued to progress and the state entered Phase II of the program. This phase requires that all cholera outbreaks be reported and a follow-up made as to source of the virus.

Meetings included: Swine management and production training in 14 counties with 700 producers participating. Thirty-five other meetings for swine producers in addition to assistance at three Experiment Station Field days attended by nearly 4,000 persons.

SHEEP

1,641,000 sheep and lambs were on South Dakota farms on January 1, 1964. About 15 million pounds of wool are marketed annually with average fleece weight of 9 pounds.

Farmers are asking Extension help for building larger, more efficient farm sheep flocks; excessive losses from parasites and diseases; improvement of market wool to eliminate excessive foreign materials and lack of uniformity of grade within the clip; selection, rations, management for increasing lamb potential; and lamb feeding.

Eight area sheep field days throughout the state were attended by 600 producers. Extension also took part in the annual meeting of wool growers attended by 450 producers. Hundreds of copies of a handbook

covering latest information were distributed at meetings by county agents.

POULTRY

In 1963 South Dakota layers produced 1,446,000,000 eggs or 2.28% of the nation's total egg supply. With nearly \$33 million in cash income, the poultry industry in 1963 ranked fourth largest among the state's livestock enterprises.

South Dakota must market about 84% of its egg production in markets outside the state which means, to meet competition, production and farm marketing efficiency must be maintained at a high level. As few as 1,200 birds may be a highly efficient unit on some farms, or it may take thousands on others.

In recent years the farm flock size has grown to commercial units of 3,000 to 7,000 or more layers on many farms. Controlled environment houses play an important part in saving labor and maintaining the health of the birds in the larger units.

It is estimated that more than 150 new poultry houses have been built and more than 300 have been completely remodeled in the state during the last four years. A survey of county Extension agents and industry indicated 120 houses were remodeled and 74 new houses built during 1962. Two hundred new and remodeled units were planned through direct Extension assistance.

Poultry producers are asking Extension for help with: expansion of facilities through remodeling or new construction; determining if poultry expansion

is feasible under individual farm conditions; developing and maintaining good farm marketing practices; disease problems; eggs — producing them cheaper, selling more at higher prices; and record keeping.

Prevention rather than cure is being stressed as a more logical and economical approach to many poultry problems, including those of diseases.

Forty of the 55 hatcheries in South Dakota are under official supervision in the continuing effort at control of pullorum and typhoid. How these diseases are spread is under study. CRD (respiratory disease), most costly U.S. poultry disease, is present in South Dakota and efforts were made to develop awareness and understanding of its seriousness.

The hatchery industry, through the South Dakota Poultry Improvement Association, is the most active poultry group. Extension takes a direct part in assisting with operation of this organization. Forty flockowners joined a flock record keeping program sponsored by the association. At the end of the year 22 flockowners had an electronic record keeping program underway. Each member pays \$12 a year and receives a quarterly report of feed costs, total operation costs and profit per flock.

Commercial egg producers are creating a ready-to-lay pullet business and through farm visits assistance was given in new construction, remodeling, ventilation and management.

Because of the nature of the present poultry business the specialist made 106 personal farm contacts in answer to special requests in addition to those made by county personnel. A series of five flockowner meetings were held in cooperation with a feed milling company with attendance of 215 persons; special training sessions had attendance of 88 flockowners and 54 feed dealers and salesmen.

DAIRYING

South Dakota has 232,000 milking cows and is one of only two states east of the Rockies that maintained dairy cattle numbers the past year. The 15,000 cows on a production testing program represents increases of 19% over 1963 and 345% over 10 years ago. Average production per cow is 6,180 pounds of milk—a record for the state. Some 43,000 dairy cows were bred artificially.

An abundant supply of good quality roughage, pasture and farm grains make South Dakota a well-adapted, low-cost production area for dairying. Sales of dairy products make up a substantial part of the financial return for more than half of the state's farmers. The \$40 million income from dairying ranks third in livestock income for the state. Local processing of dairy products adds another \$40 million to the state's economy.

Specialization in dairying has increased rapidly with markets for manufacturing milk improving.



Controlled environment laying house which balances facilities with number of birds for highest efficiency.





Dairy cattle in soybean-sudan mixture.

Dairymen are asking Extension for information and help with improved feeding of dairy cattle, breeding, management, use of farm chemicals, loose stall housing, milking plants, feed storage and handling, and milking equipment. The change over from production of cream to whole milk has brought problems of suitable buildings and equipment to produce a quality product without increasing labor.

Continuing educational programs stressed safe use of agricultural chemicals to assure an adequate quantity of high quality milk. This campaign was further emphasized when traces of farm chemicals were detected but soon eliminated in some raw milk. Gas chromatography and thin-layer chromatography provide greater sensitivity in detecting farm chemicals in milk. Because of this greater sensitivity in detection and the fact that milk and dairy products have a zero tolerance, extreme care is needed in use of farm chemicals to comply with regulations.

Off-flavor milk posed a short time marketing problem for the grade "A" milk industry. The off-flavor was blamed by some on pasturing of crested wheatgrass. Extension cooperated in a project aimed at testing various feeds if the off-flavor should appear again.

In an Extension pilot project four selected dairy farms started an experimental enterprise record system which is more comprehensive than normal records currently provided through the Dairy Herd Improvement Association. The system so far has given the farmers using it a valuable tool to make more effective management decisions. Preliminary selected results indicated hourly wage between farms ranged from 30 cents to \$2.30 and net return on investment varied from 3% to 20%.

Loose stall dairy housing is commanding more interest with at least 10 of 15 dairymen requesting assistance converting to it in 1964. They report savings of up to 75% on bedding plus cleaner cows, but dislike the frequency of cleaning the alleys. Like the beef producer, dairy farmers are devoting more efforts to improving feed storage and handling facilities to reduce losses and labor in order to gain more time for management.

PLANT SCIENCE

In South Dakota about 46 million acres are farmed or ranched.

This consists of:

Rangeland, native pasture, wild hayland: 26,600,000 acres
 Cropland: 17,500,000 acres
 Raised annually are:
 Corn: 3,955,000 acres
 Oats: 3,241,000 acres
 Alfalfa hay: 2,109,000 acres
 Wheat: 2,444,000 acres (1,177,000 hard red spring, 540,000 hard red winter, 116,000 durum, are included)
 Cropland pasture: 1,185,000 acres
 Flax: 714,000 acres
 Barley: 525,000 acres
 Winter rye: 253,000 acres
 Sorghum: 297,000 acres
 Soybeans: 177,000 acres
 Sugar beets, potatoes, safflower, soil bank land: several thousand acres each.

Each year South Dakota farmers lose considerable income because of use of high risk crops, unadapted varieties, low quality seed, poor cultural and harvesting practices, failure to exploit fully the advantages of fertilizers, and a disregard for the state's long range climatic or biological hazards such as crop diseases and pests. Ways and means of overcoming these shortcomings and difficulties constitute the effort of Extension in the plant science field.

ADAPTATION OF CROP VARIETIES

Surveys show both the effectiveness of past efforts and what needs to be done in use of adapted crop varieties: recommended varieties were planted on 94% of winter wheat acreage, 88% of spring wheat, and 86% of barley.

In 1964 descriptions and characteristics were distributed for these new crop varieties: Crim wheat, Summit flax, Lodi and Garland oats, Lindarin 63 and Chippewa 64 soybeans.

Crop variety demonstrations totaled 221 in 43 counties and yield data were obtained from 69. These were conducted in cooperation with the county Crop Improvement Associations. Thirty-three crops tours were conducted in 31 counties. Agronomists assisted with 74 meetings to discuss various phases of crops and crops production.

PASTURE AND RANGE PROGRAM

Decline in pasture and range production and increasing livestock numbers points up the need for Extension's greater emphasis on pasture-range improvement. Less than half of the native pastures are in good to excellent condition. Renovation and seeding more productive grasses are needed to increase production on the remainder, most of which is native grass varieties or bluegrass.



Research results — brought to the user through a demonstration.

Extension is attempting to induce farmers and ranchers to: use several pastures (early spring, late spring and summer, mid-summer or supplemental, fall, and perhaps winter—with different grasses in each); use more adapted native grasses or tame grass-alfalfa mixtures; improve "worn out" pastures that cannot be reseeded; and use good grazing management.

Thirteen county agents made arrangements for 17 demonstrations on improving bluegrass or native pastures. Up to 100% weed control and increased hay yield was obtained through use of 2,4-D ester and fertilizers.

WEEDS IN CROP PRODUCTION

Weeds cost South Dakota farmers an estimated \$50 million a year. Main effort of Extension has been continuing educational programs to get widespread area use of clean seed, proper seedbed preparation, good crop rotation systems, sound soil management practices, and the proper use of herbicides. Contacts in addition to landowners and government officials included commercial interests which reach a large audience in this field.

Some 3 million acres in the state were sprayed for weed control. Interest in use of herbicides applied pre-emergence in row crops and shelterbelts increased tremendously. At least three counties applied pre-emergence herbicides on all new shelterbelt plantings.

In demonstrations using atrazine as post-emergence application for weed control in sorghum a special oil-and-water combination was tried. Results indicate that a one gallon oil treatment (costing 50 cents an acre) saved a pound of atrazine (costing \$3). Control ranged up to 95%. This might also mean less chance of herbicide carry-over on small grains grown the next season. This treatment also shows possibilities for use in corn.

Weed control demonstrations in 12 counties were specifically for sagewort, sagebrush, and American wormwood. The state Weed Supervisor places the number of farms taking part in control of noxious weeds at 35,736 for 1963.

Meetings included the annual State and nine District Weed and Pest Control Conferences, four weed-fighter schools with 207 persons receiving instruction, and 31 farmer meetings plus the many meetings conducted by county agricultural agents.

SOIL AND WATER CONSERVATION

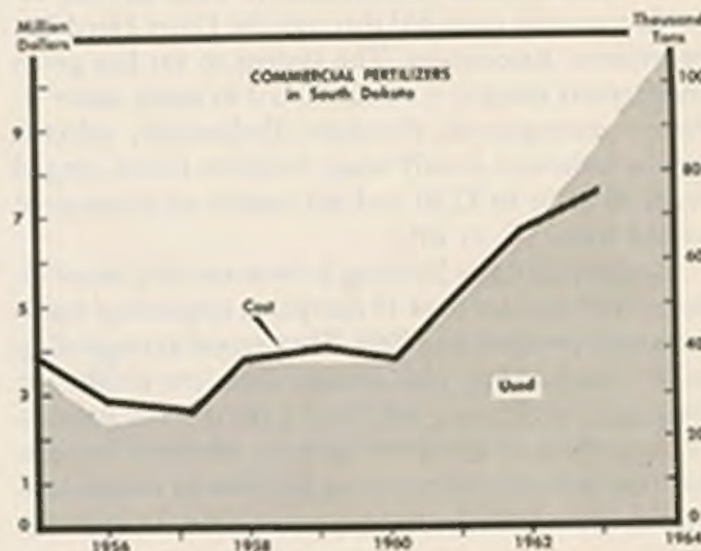
Increased use of stubble mulch as a soil and water conserving practice is readily apparent in the central and western part of the state. Blade type tillage and narrower angle settings of one-ways for stubble mulching now seem to be the rule instead of the exception in these areas. Prior to Extension education programs, complete trash coverage in the tillage operation was the general practice.

Youth participation in state and area land judging contests increased 15% as a result of demonstrations, workshops and other educational efforts. Considerable Extension effort went into cooperation with state and federal agencies in soil and water conservation.

USE OF FERTILIZERS

Although South Dakota increased fertilizer use by 33% (to 87,000 tons) during 1963—the largest percentage increase of any state—it is still less than a third of the amount needed. (The estimated 100,000 tons used in 1964 is only a 15% increase). Soils in the state have lost an average of 40% of original organic matter, 35% of nitrogen, and 15% of phosphorus resulting in a breakdown of soil structure, reduced water absorption and retention, and acceleration of erosion. The low soil fertility problem is statewide.

Demonstrations in nine counties plus shortcourses and meetings were used to emphasize the value of fertilizers. While drought conditions in much of the state prevented maximum response to fertilizers, on a per-acre basis it probably meant a break-even relationship which was considered an excellent accomplishment for such conditions. Fertilizer use, despite occasional



setbacks, is slowly becoming an established practice: cash receipts in 1960 were \$153.3 million with fertilizer investment of \$2.42 per \$100 of receipts compared with \$169 million and \$4.44 in 1964.

The 10,000 soil samples tested in 1964 at the State University laboratory represented a 30% increase over the previous year.

CROP DRYING

The Corn Belt trend toward field shelling of corn and on the farm drying-in-storage is apparent in South Dakota. Extension has been mainly concerned in assisting farmers in learning capabilities and limitations of the commercially available in-bin and batch-drying systems. Improper operation of either of these systems can result in losses.

IRRIGATION

Applications are on file for permits to apply irrigation water on 339,000 acres in South Dakota. Permit applications for 1964 were for 22,750 new acres—a 26% increase over 1962.

Most irrigation development in the past 10 years has been in the southeastern and central eastern part of the state. Additional development can be expected from water of the Missouri River reservoir system. Most immediate irrigation will develop by sinking wells.

Information sought from Extension by farmers has to do with planning changeover from dryland to irrigation farming, proper water management, and loss of water production from water wells.

Converting from dryland to irrigation farming is a highly complex and costly undertaking which must be planned and executed in detail if it is to be successful. Providing assistance in this planning has been one main function of Extension. In response to requests by 19 irrigators, Extension workers gave direct technical assistance in irrigation system type selection and basic layout. Sixty prospective irrigators attended six preliminary-information meetings. In addition, 35 individual contacts were made to help farmers assess their potential in irrigating some 1,000 acres of land.

Once an irrigation system is properly designed and installed, the key to profits is proper water management—that is, following a definite plan of when and how much water to use. Waiting for rain rather than irrigating by schedule has cost irrigators considerable in financial losses. The title of a new Fact Sheet, "Don't Wait—Irrigate," sums up an effort by Extension to encourage irrigators to plan a schedule and follow it.

Loss of production of some of the 300 irrigation wells in South Dakota has been a problem under study

for several years. Main cause of yield reduction is incrustation by minerals and bacteria when draw-down is below the top of the well screen. Treatment with certain acids has been successful in restoring most wells to almost original production. A chlorination treatment was found to deter the incrustation problem.

INSECT PESTS

Recommendations were completely revised for 1964 control of corn rootworm, a pest for many years in South Dakota cornfields which suddenly developed a strain resistant to previously used insecticides. Organic phosphate insecticides (usually in granular form) were recommended for the first time.

Revision of recommendations was no small task. The fact it had to be done rapidly serves as another example of how Extension can grasp a problem and quickly organize efforts to meet it. Surveys were necessary to establish areas of major infestation because different insecticides are required for control of different species. Aldrin and heptachlor are still recommended for areas where resistant corn rootworms have not become established. Testing of the newly recommended organic phosphates was also required. Training was imperative in new procedures for application: for instance, placement and timing were critical, and many farmers had never before heard of granular insecticide applicator attachments. The insecticide is highly toxic so safety measures were constantly stressed.

The Extension effort to control corn rootworm in southeastern South Dakota was a major reason that farmers and dealers were well prepared and resulted in savings estimated at more than \$4 million to corn

Corn rootworm control, treated (right, below) and untreated (left).



growers—even in a year in which some fields were destroyed by drought. The 600,000 acres treated with organic phosphates made up about half of the acreage infested with western corn rootworm in 1964. Damage to corn on untreated land or land treated with the wrong insecticides was estimated at \$3 million.

Extension also cooperated in weekly surveys of grasshopper infestation which were used to assist in determining where and when to institute control measures. More than 34,000 acres of rangeland in Shannon County were sprayed by airplane with excellent results.

PLANT PATHOLOGY

WHEAT STREAK MOSAIC

Date of planting recommendations (after September 10) for control of wheat streak mosaic held up for 1964 despite unseasonably warm fall temperatures. The wheat curl mite, which transmits the virus-producing mosaic, remained active well into October and posed the threat of extensive damage by the disease.

Surveys in April and May kept county agents and growers informed on severity of the disease to help in decisions on whether or not to plow up winter wheat and replant to spring grains or sorghums. Although severe in some areas, wheat streak mosaic for some unknown reason did not develop in seriousness in correlation with early leaf symptoms. However, late plantings had much less infection.

PHOMOPSIS BLIGHT

Three fungicides appear to be of potential value for control of Phomopsis blight in 1- and 2-year-old Juniper seedlings, according to observations of dem-

Much horticulture work is done with 4-H members.



onstration plots in 1964. Importance of securing a control measure can be illustrated by the experience of one conifer nursery: sale of more than a million trees was anticipated but due to the blight only about 100,000 were available.

WHEAT STEM RUST

A few growers in the north central part of the state expressed interest to Extension in chemical treatment of winter wheat for protection against a growing infestation of stem rust. The critical factors of timing and weather conditions were explained and Extension assisted where needed when two operators decided to spray 3,000 acres of wheat. Untimely rains, failure of the chemical supply and accidental spraying of the control plot made close comparisons with unsprayed areas virtually impossible. However, an evaluation indicated that the fungicide applications (two are recommended for best control) were beneficial.

SUGAR BEET LEAF SPOT

Cercospora leaf spot, a fungus disease which lowers both tons-per-acre and gross sugar yields, has been a problem for eastern South Dakota growers since 1961 when commercial beet production started. Main problems for which growers sought help from Extension were: airplane vs. ground fungicide application; gallons of water per acre to use in the spray mixture; sprayer pressures; and timing of applications.

Leaf spot research demonstration plots were established to help find answers as well as to graphically show growers the results. Benefits of a spray program were evident in all plots. Aerial sprayed plots showed a 4.8 ton-per-acre yield increase over the controls and other methods gave increases varying from 1.4- to 3-tons. In answer to speculation that higher spraying pressures would give better disease control, tests showed that 100 pounds pressure gave as good disease control as 400 pounds. While differences in results between five and three applications were not striking, the five spray schedule was favored.

Response to educational programs on disease control is measured by 3,483 acre/applications, more than in either of the previous two years. About 150 sugar beet growers in the southeastern part of the state sprayed for disease control.

Farm, home or other visits in regard to other specific crop disease situations or surveys totaled 460.

HORTICULTURE

Due to scarcity of trained landscape nurserymen or designers in South Dakota, Extension is called upon frequently for assistance in home grounds improvement. Most of this in 1964 was concentrated in 11 landscape planning workshops, plus assistance to 130 individuals and for 12 public buildings and parks.

Based on research on plastic-covered greenhouses, a number of commercial horticulture enterprises have developed over the state. Assistance was given operators of these new businesses in production and marketing of spring plants.

Since the 4-H horticulture project has the largest enrollment, much of Extension horticulture work is done with club members.

FORESTRY

South Dakota needs an estimated 300,000 acres of shelterbelts in addition to the 161,000 acres now planted in order to conform with what forestry authorities agree is necessary for adequate protection—3% of cultivated cropland in trees.

Results of Extension emphasis on shelterbelts may be noted by the 1964 total of 7,506 acres planted, an increase of 642 acres over the previous year and 168 acres over the 10-year average. A campaign for better care of existing shelterbelts began to pay off with surveys showing considerable improvement in chemical weed control, rehabilitation, and reduction of damage by grazing.

A ready market for pulpwood and posts is focusing more attention on the 1,700 small privately owned woodlands, covering 150,000 acres, in the Black Hills. Stand improvement practices, mainly thinning, are needed for many of these small tracts, two-thirds of which average only 23 acres in size. Extension assistance is credited with helping owners of at least 900 acres improve and thin heavy stands. Timber losses have mounted the past two years because of a heavy infestation of the Black Hills beetle. Extension also cooperated in the effort to control the timber beetle.

By promoting the Tree Farm program, Extension in 1964 was able to count 15 new certified farms covering 3,286 acres. This exceeded the goal by 1,286 acres. The state now has 242 Tree Farms covering 37,021 well-managed timbered acres.

FARM BUSINESS

South Dakota farmers and ranchers facing changes and adjustments in order to secure satisfactory farm incomes were able to turn to Extension for assistance.

Economic data and planning tools were assembled so that farm families can evaluate and make decisions on alternative farming systems for individual farms.

Continual adjustments in organization and operation of farm and ranch units are necessary to secure adequate net incomes. With increasing difficulties of securing adequate land and other physical resources, Extension has responded to requests from both renters and landlords for information on methods of acquiring, retaining, or transferring physical resources, and



Pruning Black Hills pine.

about equitable methods of leasing them under various contract arrangements.

Continued also was the policy of Extension, in answer to requests by farmers, to give impartial advice and counsel on how federal programs may affect individual farm operations.

In addition to individual assistance in answer to requests, thousands of copies of publications, guides, forms, outlook newsletters, and other material were distributed. Training sessions and workshops enabled county personnel to give further assistance in such areas as farm budgets, business practices and procedures.

SAFE USE OF PESTICIDES

Increased use of the widening array of pesticides has brought additional problems dealing with safety for users and handlers as well as residues in food. Extension gave full support to the Safe Use of Pesticides program in cooperation with other state and federal agencies. An educational campaign was supported by other efforts such as: informing medical doctors of the location of the South Dakota Poison Control Center; stressing precautions to use and importance of following directions in all pesticide recommendations; and investigating reported accidents.

All Extension personnel (those on both the county and state staffs) are continually striving through the on-going educational programs to help people recognize the great need to safely use the many pesticides needed and now available for control of weeds, insects, and diseases.

marketing, use of agricultural products

Marketing and processing firms and individuals involved in the distribution from farm producer to consumer add about \$100 million annually to the value of South Dakota agricultural products. Extension's objective is to aid in obtaining greatest efficiency in all phases of marketing and to help people better understand the complex forces determining prices.

OUTLOOK AND MARKET PRICE INFORMATION

Outlook and marketing information provide producers and marketing agencies a means to plan operations intelligently. In 1964 price projections for lambs and wool commanded considerable interest because the price for cattle, the main alternative use of grass in the producing areas, was relatively low. Marketing information was included during eight area sheep field days attended by 600 persons. A series of 15 area feed and livestock outlook meetings in eastern South Dakota attracted 1,153 cattle producers.

DAIRY PLANT FEASIBILITY

A cheese plant was established in April at Mission following a 2-year feasibility study devoted to boosting development in the Todd County area through better utilization of available land and labor resources. Extension agents within 60 miles cooperated with the South Dakota Indian Bureau, the Rosebud Indian Council and other organizations in evaluating dairy resources. The plant, when firmly established in the market, is expected to employ 10 persons and increase income for dairy producers by about \$500,000 annually.

FEED MILL EFFICIENCY

Many South Dakota feed mills must modernize to meet growing demands of the farmer and to improve plant efficiency. At the request of several operators,

Extension conducted a series of workshops with key employees of the mills taking part. Some results: addition of equipment and redistribution of labor in two plants increased sales volume from 30% to 40% and reduction in manufacturing costs of 93 cents per ton of feed in one mill and \$1.31 in another.

NEW EGG MARKET

Processor and producer meetings in which Extension cooperated with other agencies resulted in establishment of a new quality egg marketing facility at Parker.

NEW FOREST PRODUCT PLANT

Extension, working with the State Forest Service, helped establish a post and pole processing plant in the southern Black Hills which opened a new area for harvesting small lots of timber.

BUSINESS MANAGEMENT

Five workshops for cooperative managers and directors were held in South Dakota as part of a three-state regional effort by Extension to acquaint administrative personnel with broad concepts of modern business management. Average attendance was 43 persons.

PORK PRODUCTS

To improve the quality (less fat and more meatiness) of hogs marketed in the state, Extension cooperated with packing and marketing firms in conducting five workshops dealing with live animal meat evaluation. Some 420 producers entered more than 700 hogs for evaluation. Complete cut-out information was provided 38 producers who entered pigs in the South Dakota Swine Evaluation Station. The Sioux Empire Farm Carcass Show revealed that meat type hogs have increased 36% during the past 5 years, indicating that market quality improvement programs are producing results.

GRAIN PRODUCTS

Nationally South Dakota ranks fifth in production and first as an interstate shipper of oats—but for the past several years the high quality oats going to central grain markets contained too high a mixture of barley. In 1962 more than half the South Dakota oats had price discounts of 2 to 5 cents a bushel because of too much barley. A continuing series of Extension meetings explaining the situation apparently has resulted in improvement of oats quality, according to milling oats buyers.

HOME INDUSTRY

Home Extension club members in the pheasant producing area of the state are learning pheasant craft. Many members add to family income by making pheasant feather craft articles and selling them locally, in tourist shops, and to some out-of-state markets.

Work of Extension has helped improve management and marketing of Sioux Enterprises, Inc., a business venture of the Sioux Indian tribe at Sisseton.

home economics

To meet specific needs of South Dakota families, Extension home economics programs were determined by individual counties during 1964.

Management decisions become more critical with increasing number of choices families must make. This is compounded by other factors: volume of advertising to which families are exposed, extensive use of available credit, human resource potentials for financial aid and as additional sources of energy, and educational problems at high school level and above.

Several pilot programs and an informal study were started to aid county program planning groups.

A five-county pilot program on financial management helped young families to learn systematic processes of management, ways to recognize economic problems, and the value of having facts when making decisions.

Eleven counties participated in an informal study of food marketing habits. Two hundred forty-two families, with an average size of 4.5 members, kept detailed records of food market purchases. Included were 132 farm families, 48 rural non-farm, and 62 urban.

Average total monthly cost for all food for farm families was \$77.92 compared with \$98.01 for rural non-farm and \$98.16 for urban.

Where the family lived influenced how money was spent. Farm families spent most (30%) for fruits and vegetables. Breads, cereals and dairy products accounted for 17% of the farm family food dollar. Rural non-farm families also spent most for fruits and vegetables (25%) followed by 23% for dairy products. Urban families spent the largest amount for meat and other protein foods (29%), followed by 24% for fruits and vegetables.

FAMILY ECONOMICS

Changes in use of resources during different stages of the family life cycle were emphasized. All county home economics agents took part in workshops studying use of credit, planned insurance, management of human and financial resources, planned educational programs, and use of free and leisure time.

Four counties were in a pilot study on stretching human and financial resources. Emphasized was man-

agement of time and energy of human resources, and planned family spending and record keeping to stretch financial resources.

Pilot projects were conducted in four counties to test and evaluate 4-H projects in money management. Topics included: education costs and plans beyond high school, contracts and consumer credit, cost of operating and owning an automobile, and use of bank facilities. The projects were so successful that a second series based on cost of young marriages is planned for 1965.

FAMILY LIFE

Main objective was to aid South Dakota families to become well-informed units better able to assess their values, to set goals and to achieve progress through appropriate action in areas of family concern, with special emphasis on the family and free time.

Four counties studied family free or leisure time through home economic agent and project leader training meetings designed to teach importance of leisure time activities in individual development, in building better family relationships, and in providing enriched living experience.

Family life pilot studies in five counties included these subjects: needs of older persons; what parents need to consider in guiding children's education; women today—their concerns and values; sex education—its need and how to meet it; and recognition of the gap between generations—the changing world that today's children live and grow in, the importance of parental recognition of individual growth and de-

TV is one tool used for giving household hints.



velopment, and knowledge for effective parental guidance and training.

CLOTHING

Twenty counties conducted clothing construction workshops on fabric selection, choice of pattern to fit the fabric, and construction methods needed to work with newer fabrics and fabric finishes.

In 20 counties instruction in 4-H clothing was given on basic construction, care and use of the sewing machine, and consumer information on judging construction in both hand sewn and commercially sewn garments.

NUTRITION

To assist counties in planning nutritional studies several training sessions were held on "Meals with Ease." Included were meal planning, scheduling, shopping, and food preparation.

HOME FURNISHINGS

County programs worked with color and design to learn to recognize guide posts that apply to home

furnishings. Project leaders and home economic agents also studied accessories in home furnishings to recognize good design and apply these principles to the selection of household accessories.

BENCHMARK STUDY

Purposes of a Hutchinson County benchmark study were to determine the level of knowledge of homemakers in selected subject matter areas, and to use the findings for programing in that county. Findings also indicated possible areas of instruction throughout the state.

Preliminary results in the food and nutrition section of the study indicate: scant attention is given to balanced diets; few people eat enough vegetables and fruits, especially those rich in Vitamins A and C; amount of milk used is low; many people producing their own milk use it unpasteurized; canning non-acid vegetables and meat without steam pressure; and a large per cent of family owned freezers are used mainly to store meat.

Local volunteer leaders teach basic knowledge and skills in specific project areas.



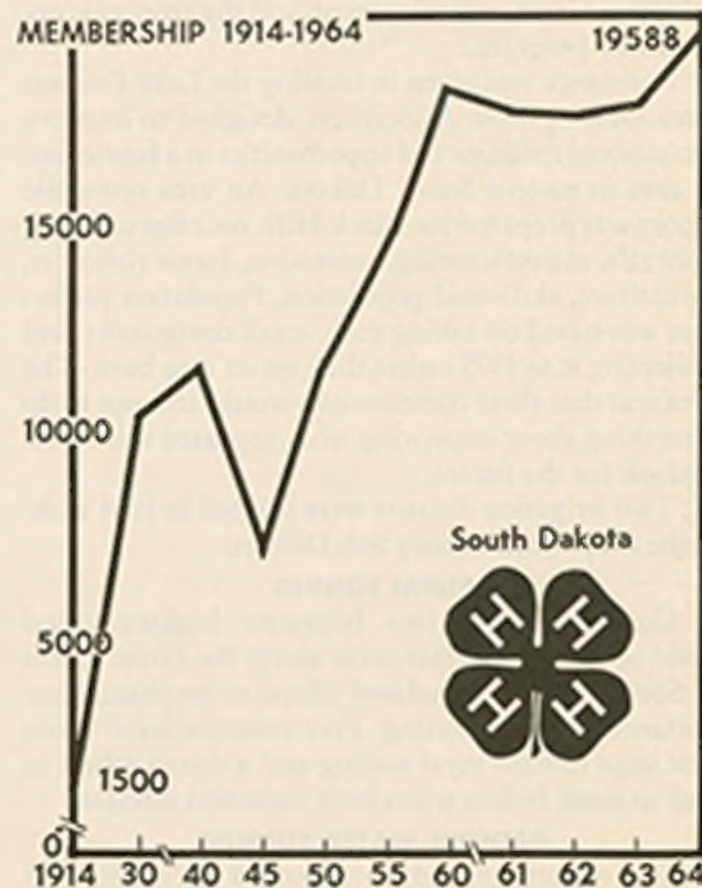
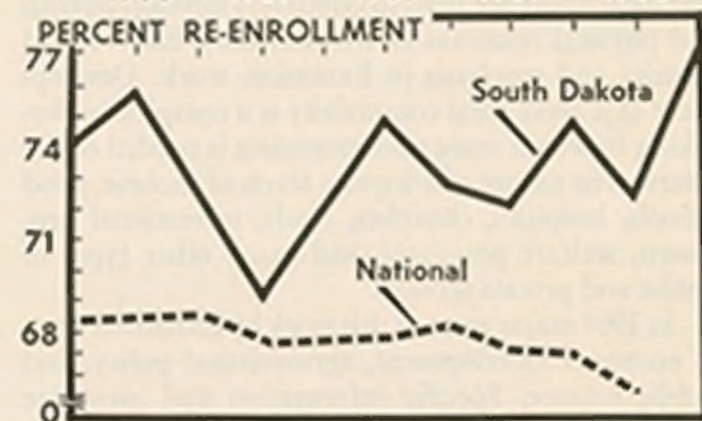
4-H and other youth programs

The Extension program designed for youth is to assist young people in making their best personal growth and development from the time they encounter situations and influences outside the home until they become adults. An all-time high in 4-H enrollment was reached in 1964 with a total of 19,588 girls and boys.

Several projects were carried out on a pilot basis in an effort to expand interest. They included: dog, money management, rocks and minerals, bees, rabbits, minnows, photography, and welding. Science is receiving new program emphasis in South Dakota 4-H work.

Extension specialists conducted subject matter training for 1,480 county project leaders. These leaders in turn conducted training programs for club leaders in counties. Thirty-three counties were represented by 150 leaders at the annual adult leaders camp and 37 leaders took part in the 4-H Leader Forum in Washington, D. C.

State Club Week activities on State University campus attracted 586 delegates. Camp Lakodia and Camp Box Elder served a total of 3,072 campers during the year. Nearly 2,000 club members registered and had a total of 5,354 exhibits at State Fair in Huron. More than 1,100 exhibits from 23 counties were shown by 614 boys and girls at the Western Junior Livestock and 4-H Home Economics Show at Rapid City. Nine district Share the Fun Festivals had 1,436 participants.



rural area development, public affairs

Rural Area Development, in which cooperation and local effort are used to effectively develop human and physical resources of a community, has received priority and emphasis in Extension work. Development of a good rural community is a complex undertaking in which more understanding is needed of the interwoven nature of adequate levels of income, good schools, hospitals, churches, roads, recreational programs, welfare programs, and many other types of public and private services.

In 1964 major areas of this work by Extension were in economic development, agricultural policy, and public finance. Specific information and assistance were provided to many communities in rural areas development, area redevelopment, and the economic opportunity program.

Assistance was given in creating the Lake Poinsett Area Development Association, designed to improve recreational facilities and opportunities in a four-county area in eastern South Dakota. An area economic report was prepared for Black Hills counties covering minerals, manufacturing, recreation, forest resources, agriculture, skills and population. Population projection was based on taking each small community and projecting it to 1975 rather than on an area basis. The idea was that these communities would attempt to do something about improving what appeared to be their outlook for the future.

Two irrigation districts were formed in 1964 within the Oahe Conservancy Sub-District.

RURAL ZONING

Construction of two Interstate highways and build-up of recreational areas along the Great Lakes of South Dakota stimulated efforts to emphasize importance of rural zoning. Five counties have taken first steps toward rural zoning and a dozen others as well as some Indian tribes have indicated interest.

GROUND WATER SUPPLIES

One county ground water survey started in 1964 and another was pending. These surveys will average

a test hole to bedrock every square mile to log and tabulate sands, gravel formations, and other mineral deposits as well as water resources.

RECREATION

The added stress on development of recreational facilities includes an emphasis on need for orderly development within any particular area. Extension is active in giving direct assistance in addition to training and educational programs devoted to development of resources of water, game, and scenery. Some of these include:

The Martin community will expand its city park and playground.

Carthage is another example of local people developing a community recreation area.

A study is underway to determine the feasibility of converting a portion of farms in eastern South Dakota to pheasant production.

In the Oahe area, Extension is also cooperating in planning and development of a "pilot" resort by a private individual and which upon completion will be used as a result demonstration.

INDIAN RESERVATION RESOURCE DEVELOPMENT

Under an annual contract arrangement with the Bureau of Indian Affairs, Extension has a field staff of 15 agricultural and home economics agents serving on seven major Indian Reservations. Resident Indian population totals more than 30,000 with land resources of the reservations adequate to support less than 15% of this population.

Examples of Extension resource development work on various reservations include:

Preparation of background information in support of securing loans in the interest of establishing a plas-

Visitors at the county agent's office at Pine Ridge.



tics plant at Mobridge which would provide local employment and a new payroll.

A joint study toward expansion of coal mines in a western county.

Dairy herd size expansion and new producers encouraged among patrons of the Selfridge Cheese Manufacturing Plant.

Six of seven reservations organized for Public Housing Projects with a total of 422 housing units scheduled.

A community was assisted in contacting a sportswear company to encourage location in the area.

Surveys were made of cattle production and feeding in an area in which considerable interest is being shown in establishing a meat processing plant.

Commercial fishing was studied as a new industry in the Oahe reservoir area.

A muffler manufacturing plant started operations on one reservation with 18 persons currently employed and a potential of more than 30 employees.

Seven vocational training classes were assisted in organizing under the manpower Training and Development Act.

Extension fits into the picture far more than at the planning and development stages of these various undertakings. With a reliable income, these families continue to look to Extension for guidance in the many aspects of family living and home management.

PUBLIC AFFAIRS

AGRICULTURAL POLICY

The need for a continuous adult education program in the area of public affairs is becoming increasingly obvious. To achieve the community growth necessary to maintain a rapidly-changing agricultural economy, individual and group efforts must be aimed toward developing the kind of rural society that can compete with other areas in the nation.

Extension's place in this effort is a combination of educational programs, leadership, organization, and guidance.

WHEAT PROBLEMS AND POLICIES

Wheat sales make up about 11% of South Dakota's cash farm income so what happens to national and international markets and to government farm programs is highly important. Three district wheat meetings were conducted to discuss national wheat problems and programs. These were in addition to an extensive campaign to explain the 1964 wheat program.

TAXATION

Of the main tax problems in the state, two are of prime concern: continual increase in property tax; and financing education and school district reorganization. Most of the preliminary efforts concerned attempts to overcome lack of understanding about a procedural framework within which to work to improve tax judgements.

EXPANDING EDUCATIONAL OPPORTUNITIES

Surveys and requests show that South Dakotans are becoming more aware of the need for additional off-campus as well as on-campus training, formal and informal. As a result South Dakota State University, through regular staff and Extension personnel, has cooperated with public schools in establishing or planning off-campus classes. Some of these include:

Watertown Evening Class Extension Center. Fifty-two students enrolled in five undergraduate college credit courses. Four graduate courses were offered in Watertown for continued education for school people with work programmed toward a master's degree in education.

Graduate classes are to be offered at Mitchell and Sioux Falls under much the same type of arrangements as at Watertown. Other areas showing interest were Huron, Chamberlain, and Pierre.

Two special off-campus workshops were conducted for guidance counselors and supervisors in ASCS.

RURAL CIVIL DEFENSE

The work of Extension in Rural Civil Defense (Rural Emergency Preparedness) is mainly educational in rural areas and in preparing staff members at all levels to conduct information and training courses. It is conducted in cooperation with other county, state and federal organizations.

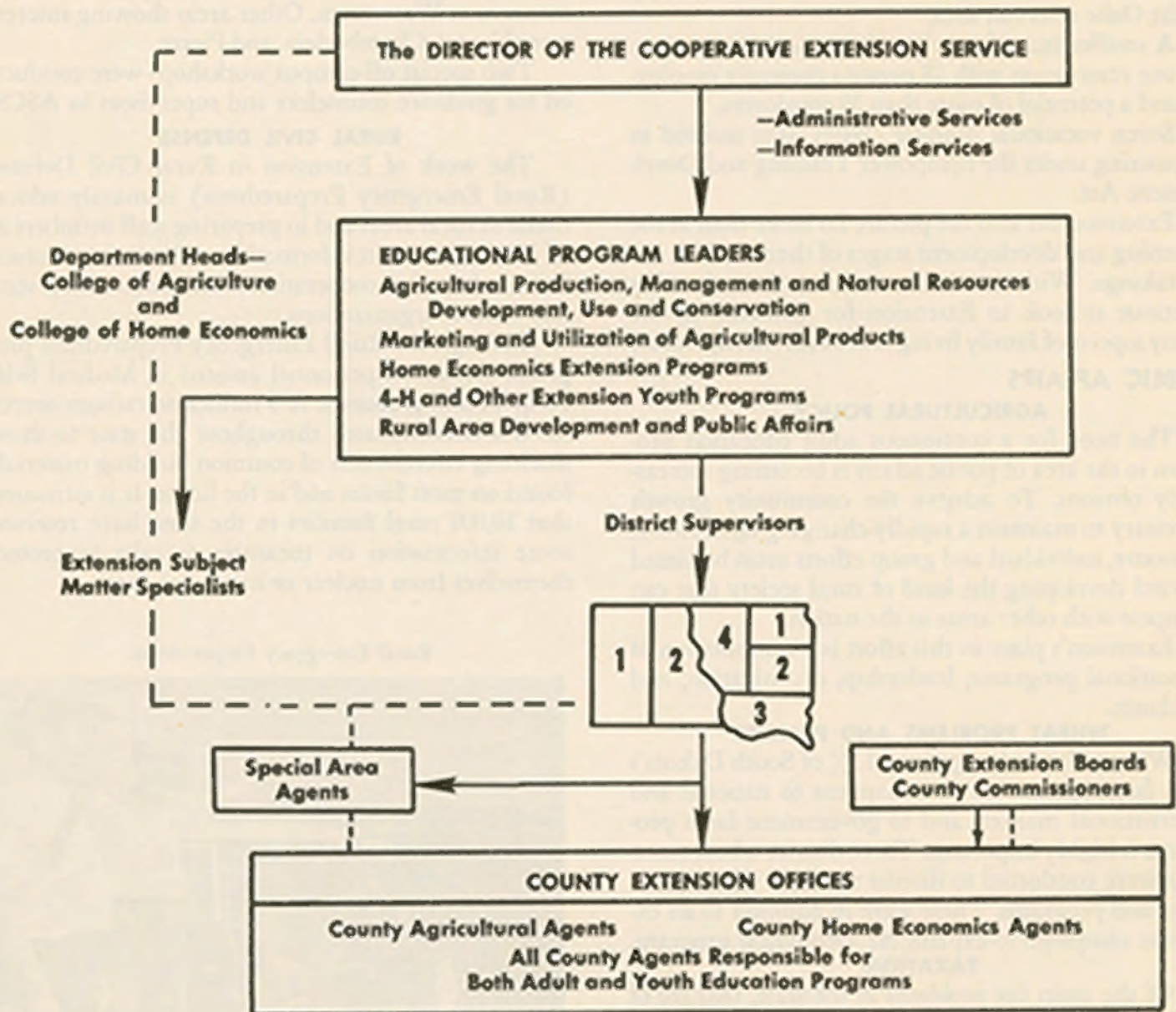
Through the Rural Emergency Preparedness program, Extension personnel assisted in Medical Self-Help Training courses. A 5 millicurie radium source set was demonstrated throughout the state to show shielding effectiveness of common building materials found on most farms and in the home. It is estimated that 10,000 rural families in the state have received some information on measures to take to protect themselves from nuclear or natural disasters.

Rural Emergency Preparedness.



Organization of the Cooperative Extension Service in South Dakota

The PEOPLE OF THE STATE
The REGENTS OF EDUCATION
The PRESIDENT OF SOUTH DAKOTA STATE UNIVERSITY
The DEAN OF THE COLLEGE OF AGRICULTURE
UNITED STATES DEPARTMENT OF AGRICULTURE



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