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The Northeast Station ... 25 years of Research, Extension and Service

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The Northeast Station... 25 years of Research, Extension and Service

This aerial view of the Northeast Station at Concord shows the diverse terrain of the area.

For the past 25 years, the Northeast Station at Concord has served as the cornerstone of University of Nebraska agricultural research and Extension activity in northeast Nebraska. This year marks the twenty-fifth anniversary of the founding of the station and commemorates the dedication of the citizens of this area in their commitment to its success.

While the land the station occupies may not look different from its surroundings, its purpose is. The Northeast Station operates as a part of a statewide agricultural experiment station and Cooperative Extension Service network. The mission of the station is to research agricultural topics that are important to northeast Nebraska and to provide this and other available information to farmers, their families and other interested people.

Station History

The beginnings for the Northeast Station came in December of 1954 when local citizens formed the Northeast Nebraska Experimental Farm Association. The Association was organized for the sole purpose of obtaining an experiment station to serve the northeast part of the state.

The original idea for the experiment station came from Rollie Ley, a Wayne banker. Albert Watson, also of Wayne, played a prominent part in organizing the Association. He served as temporary chairman during the organization period and as the Association's first president. Other officers during the first year were Walter Chace of Pilger, Willard Burney of Hartington and R. Chester Graff of Bancroft.

The Association was incorporated in 1955. As a part of the articles of incorporation for the organization, the main purpose of the group was to "promote, encourage and procure the establishment and operation of an experimental farm in northeast Nebraska; to solicit and

secure funds by gifts, donations or otherwise to be used in acquiring, owning and providing suitable land and to hold, give or convey same to an institution such as the University of Nebraska to be used and operated as an experimental farm . . ."

The Association arranged a fund-raising campaign organized in each county to raise money for the purchase of a farm to then be given to the University for research. Through the sale of \$25 memberships and gifts, nearly \$40,000 was raised during 1955.

The first major financial contribution was the gift of a 320-acre farm valued at approximately \$70,000 in 1956. This farm was given to the University of Nebraska by the C. D. Haskell family through the arrangement of the Association. In exchange for the land donation, the Association also agreed to set up a scholarship fund through the NU Foundation in the name of Margaret T. Haskell. A \$25,000 fund was created to provide interest-free or low-interest loans to northeast Nebraska

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This article was compiled from information provided by the faculty and staff of the Northeast Station. Coordination of the material came from Cal J. Ward, director. Photography for the article was by Bart Stewart, Ag Communications, University of Nebraska-Lincoln.

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From the beginnings of the Northeast Station: left to right, standing, Dr. E. F. Frolik; Perry Branch; Albert Watson, first president of the Northeast Nebraska Experimental Farm Association; seated are Mr. and Mrs. C. D. Haskell.

male students majoring in agriculture or engineering at the University.

As plans were made for developing buildings on the new station land, C. D. Haskell came forward again. He challenged the Association to raise additional funds to build a headquarters and other buildings and promised to match any additional funds raised by the Association. The Association raised \$8,850 and Haskell matched that amount with funds of his own.

Richard Adkins, of Osmond, was a member of the University Board of Regents and a member and supporter of the Northeast Station. Through his efforts and by using the local contributions as proof of public interest, University funds were allocated to build the headquarters building.

The Association continued in its developmental role by loaning the station money to purchase the first lots of cattle for experimental use and by giving \$4,000 to help purchase three upright silos.

In 1967, the Association cooperated with the local pork producers in another fund drive which raised

\$22,000 for building a swine research facility at the station.

The Association has continued to provide small grants annually for special needs, including funding for special 25th Anniversary Field Day activities. Throughout the years, the support of northeast Nebraskans has been evident. Nearly 2,000 individuals have purchased memberships or given donations to the Northeast Station.

Research and Extension

Research and Extension activities at the Northeast Station center on the particular needs of northeast Nebraska. The station houses a team of 12 University faculty members and additional support staff whose activities cover most of the agricultural subject areas. The Cooperative Extension Service function of the station is channeled through the Extension offices in each county in the Northeast district.

Research has been centered on numerous topics at the Northeast Station including pasture improvement, swine housing and management, conservation tillage, dairy

cattle, forestry, 4-H and youth development, beef cattle, soil conservation and irrigation, entomology, weed control and crop variety testing, and soil fertility. Highlights of these research areas follow:

Pasture Improvement

Pastures have always been an important component of the farm enterprises in northeast Nebraska. Yet, through the years, they have often been characterized as our most abused crop. Although a large part of the research program in northeast Nebraska has been devoted to corn production, the subject of pasture improvement has received some consideration.

Early pasture improvement research was conducted at various farm sites throughout northeast Nebraska and involved variety and fertilizer requirements. Major research was also done on the response of brome grass to fertilization. Research on the response of other pasture grasses to fertilizer also followed.

Through the years, research has shown that fertilization was one management input that could substantially increase production from the abused pasture acres. With farmer needs for beef production results, limited grazing studies were conducted to measure the effect of fertilization in terms of the amount of beef produced.

While research has shown that management practices such as fertilization, rotational grazing and weed control could improve production from many pasture acres, some had been abused to the extent that renovation was needed. This need has resulted in initiation of new avenues of pasture management research being conducted now. Research is being directed to development of systems where either grasses or grass/legume mixtures can be seeded into abused pastures with the use of minimum tillage techniques.

Swine

Research in swine housing and management at the Northeast Station began in 1968 and was limited



Extension swine specialist Mike Brumm shows pigs used to test different rations and management practices for newly received feeder pigs.



David Shelton, Extension engineer records the temperature in a hog house on a tape recorder, which in turn feeds into a computer for analysis.

to the growing-finishing phase of production.

Research included study of the modified open-front concept of housing, the slatted floor concept, a study of odor levels in different housing types; the effects of slatted floors on ulcer incidence or respiratory incidence; how continuous light effects growing-finishing; feet and leg problems of pigs, bone breaking strength, bleeding pig disease, and tail biting.

Since 1979, research efforts have focused on management of the stressed feeder pig and energy conservation techniques for the early weaned pig.

Research has included the performance of purchased pigs (at both local or distant markets); receiving diets of purchased pigs; and swine housing of weaned pigs.

Conservation Tillage

Soil conservation was one impetus for the establishment of the Northeast Station. The sloping hills and highly erodable soils of this area have made soil erosion concerns a major program throughout the station's history. These programs have included both research and demonstration of conservation structures, such as terraces, and reduced or conservation tillage.

Research on conservation tillage at the Northeast Station has centered on herbicide selection and comparison, fertilizer requirements and placement, and erosion control comparisons for various tillage and planting systems. Extension programs have covered these areas, as well as fuel and labor comparisons for various tillage systems.

In 1979, a study was initiated to evaluate the soil erosion control potential of conservation tillage systems in oat residues, since oats are an important Northeast Nebraska commodity. Four tillage systems, moldboard plow, disk, stubble mulch or undercut, and no-till were included in the study.

Since continuous corn is common in Northeast Nebraska, a study involving five common tillage systems

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was conducted to measure erosion control effectiveness.

Conservation tillage can be an effective means of reducing soil erosion as well as fuel and labor requirements for crop production. Research at the Northeast Station has been devoted to assessing the effectiveness of conservation tillage systems, and developing and testing management techniques to make these systems practical. Without a doubt, the activity in this area will continue to be an important component of our total program.

Dairy

Northeast Nebraska has been a major dairy producing area for many years with one-third of the state's dairy cows located in this area.

The changes in the dairy industry that have taken place in the last 25 years have created a real need by producers for technical assistance.

Early in this period, record keeping and basic management were stressed. Then buildings and equipment changes were important as bulk milk became law. After this, registered cattle and business organization became vital because of expansion and second generation involvement.

On-farm demonstrations and research have included lead feeding, magnet feeders, worming, forage testing and ration building, reproductive herd health programs and currently an effort in mastitis control and overall management.

The mastitis program which began three years ago includes 32 demonstration herds and a full-time technician in an interdepartmental effort which is statewide but coordinated from the Northeast Station. This program has generated over \$250,000 of outside support and is being cited as a model on the national level.

A major effort in the dairy program has been organizational help to local producers. Assistance has been given breed groups, the Nebraska Dairy Women, A.I. organizations, DHIA groups, the central testing laboratory, the farm business

association, young cooperators group and the organization of a herd health program in addition to the mastitis control program.

A constant effort has also been made to upgrade and demonstrate new and effective teaching methods. Up to 50 meetings at 25 locations in 12 days, reaching one-third of the dairymen producing two-thirds of the state's milk has been accomplished by using multimedia and the conference telephone. Similar programs have been used during the last three years.

The dairy program will continue to adjust to meet the ever changing needs of the dairy industry in northeast and the rest of Nebraska.

Forestry

The northeast district Extension forestry program began in 1958 to improve the forest resources and to increase the acreage of forest resources in the district.

Each year emphasis has been on the Clarke-McNary Tree Program. The program offers tree seedlings to the landowner each spring for planting to control soil and water erosion, wildlife habitat, woodlot plantings, recreation and Christmas tree production. Since 1958, approximately 12 million seedlings have been sold to the cooperators in the district. The last several years have seen an increase in the number sold each year.

For the past five years, emphasis has been placed on increasing the survival rate of the tree plantings each year. Additional publicity on site preparation before planting, storage and handling of trees, improved tree planting practices and weed control after planting increased the average tree survival from about 50 percent to over 80 percent each year. Training meetings for other public agencies' staff that are involved in the tree planting program have been presented each year. About 90 percent of the trees planted in the district are planted by Natural Resources District tree planting crews.

During the last 10 years, the conversion to self-propelled irrigation systems for farming has resulted in reduced areas of windbreaks and woodlots. Trees were removed from the fields and the land use changed to cropland. After the irrigation systems are installed, a few corners in the fields are planted to trees. The number and acreage of field windbreaks planted each year has declined during this period.

The tree resources of each community of the district are not receiving proper management. Five years ago, the Community Forestry Program was begun to create awareness in the community of the forest resources and assist with tree removal, tree planting and maintenance of the



Extension forester Dick Gavitt shows northeast Nebraska residents the benefits of farmstead windbreaks for home and livestock protection.

present trees. The forester advises the city government on the public owned trees, not the trees on private property. Twenty-five communities in the northeast district are provided assistance.

Beef Cattle

The beef cattle research program at the Northeast Station was established in 1959 to improve the efficiency of utilization of feedstuffs which are available to livestock producers in northeast Nebraska. Currently the station has facilities to feed approximately 400 head of cattle. Facilities include a number of dry corn bins, oxygen limiting storage bins and three bunker silos, plus necessary feed mixing and weighing equipment required for research.

Much of the beef cattle research conducted at the station in the 1960's was concerned with the protein needs of growing and finishing cattle, performance and feed efficiencies of cattle, the addition of enzymes to feedlot rations, the effects of diethylstilbestrol and synovex on feedlot cattle, and the feeding value of drought damaged corn.

By the late 1960's and early 1970's, much research was being conducted with high moisture corn and roughage utilization.

From 1975 to 1981, studies at the station were conducted to assess the supplemental protein value of alfalfa and the effect of bacterial and acid preservatives on corn and alfalfa silages.

Currently studies are being conducted to determine levels of alfalfa haylage and silage needed in corn silage rations to optimize gains and feed efficiencies of growing feedlot steers.

The beef cattle research conducted at the Northeast Station over the past 25 years has provided useful and pertinent information for the beef cattle industry. Through the solid support of many beef cattle producers in northeast Nebraska, much of the research at this station has been conducted in a manner that meets the needs of the producer and yet increases our overall understanding of the beef animal's nutritional requirements.



Extension beef specialist Terry Mader examines corn silage as he evaluates various systems of harvesting and storing home grown feeds for beef cattle.

Youth Programming

Four-H project camps added a new dimension to 4-H club work in the northeast Nebraska. The project camps were designed to supplement the work of the 4-H leader and to encourage enrollment in 4-H projects.

These camps have been held at the Northeast Station and in county fair facilities.

Since 1970, a total of 43 camps have been held with over 800 youth participating. These camps have included dairy, crops, plant science, swine, bees, livestock judging, foods, entomology, sheep, tractor, horse, poultry, photography and junior leader.

Four-H members are willing and able to tackle tough problems facing youth. This was evident as 4-H Junior Leaders in northeast Nebraska developed the "Reflections in a Glass" program to place emphasis on the problem of alcohol use among youth.

The program was developed initially as a result of an "Image and Needs Assessment Survey" conducted in Madison County in 1978. Alcohol and drugs among youth were identified as a major concern.

The basic philosophy of the program was that teenage youth could effectively educate their peers and younger youth about alcohol.

Older 4-H members received training at two overnight workshops. They received information about alcohol use and misuse and were provided with techniques they could use in making presentations to other youth groups.

Team members involved in this project made over 125 presentations with over 3,200 youth and adults in attendance. These presentations included school classes, junior leader groups, PTA groups, church groups, 4-H and Home Extension Council Health Awareness Conference and the state fair.

Each year over 2,000 adults become new 4-H leaders, however, almost half of these new leaders do not continue beyond the first year.

A study of the new 4-H leaders in northeast Nebraska was started in 1980 to determine why these leaders decide not to continue in the leadership role and if there were differences between these leaders and those who continued as leaders.

The study revealed that most 4-H leaders are being recruited by the present 4-H leader, they may offer

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their services, to the leader or they are asked by the 4-H members.

Those adults that continued as leaders did so because their children were in 4-H, they believed that 4-H is an important youth program, they liked to work with young people and they learned new skills themselves. Many of those adults who did not continue as leaders indicated that their work took all of their time. They also indicated a dissatisfaction because of lack of parent cooperation and the amount of time required for the task.

The study revealed no significant differences between current and past leaders and their sex, occupation, education level, living location and if they were former 4-H members. The study did show that slightly less than half of the individuals have education beyond high school and that those new leaders who were under 30 and over 50 years of age were more likely to discontinue as leaders.

A current study looking at the influence of 4-H on advanced training, careers, and leadership roles in adulthood. Four hundred and ninety-nine former 4-H'ers who were born between 1944 and 1954 from Boyd, Stanton, Antelope, Cedar, Holt and Madison were selected to participate in this study.

Soil Conservation

Soil conservation has been a major interest at the Northeast Station from the outset. Early work demonstrated the till-plant system of crop production. This system prepared the seedbed by scalping the ridge left by the old crop row, pushing the residue aside, and leaving a protective cover of crop residue on and mixed in the surface layer between rows. Seedbed preparation and planting were completed in the same operation.

Watershed studies in the early '70's concluded that a 90 percent reduction in soil loss could be realized by using the till-plant system on the contour compared to conventional tillage in straight rows.

Irrigation

Irrigation has become an important area of research at the Northeast Station in recent years. Over 6,000 irrigation wells have been registered in the thirteen counties supplying water to nearly 4,500 center pivot irrigation systems. Most of the center pivot systems are placed on the sandy soils in the western portion of the district with the remainder installed on the sloping uplands in the loess hills of the east. Proper management in both areas includes both irrigation scheduling techniques and soil conservation practices.

Since 1980, the northeast district has expanded the irrigation scheduling emphasis by encouraging the completion of the transfer of irriga-

tion scheduling technology by promoting the organization of several irrigation scheduling associations.

Research is currently underway to learn which combinations of tillage practices and sprinkler nozzle types will allow the irrigator to minimize runoff under center pivot sprinklers thus conserving water, energy, and soil resources.

Entomology

The entomology program at the station has assumed a leadership role in the research on the biology and control of the European corn borer and limited emphasis on the research of potential insect pests of soybeans and the biology and control of corn rootworms.



Tom Dorn, Extension irrigationist, evaluates the evaporation pan as a simplified irrigation scheduling device.

Investigations into other areas of concern include the cataloging of insects common to Nebraska soybeans. This study is being partially funded by the Nebraska Soybean, Development, Utilization, and Marketing Board.

The Northeast Station is one of only two districts in Nebraska where University efforts are being concentrated to demonstrate to farmers and stockmen the principles of Integrated Pest Management on their agricultural lands and feedlots. The primary activity is in the training and supervision of insect field scouts.

Meetings are held during the winter to promote the IPM concept and to schedule scout training sessions. Scout training sessions are held in late winter and early spring with emphasis on scouting techniques and insect identification.

Later in the growing season twilight tours and in-field training sessions are held to keep growers and field scouts up-to-date with current insect conditions. Additional information is made available through the use of a weekly newsletter, radio tapes, newspaper articles and televi-

sion appearances. Training sessions are aided by the use of an extensive insect collection of color slides and preserved specimens that have been collected over the years.

Present programs deal mainly with corn and feedlot insect pests. Time has also been spent promoting the IPM concept with grower organizations and agri-business groups.

Another long range Extension program deals with demonstrating the concept of counting rootworm beetles in late summer with the intent of identifying those fields with minimal possibility of rootworm larval damage if again planted to corn.

Weed Control

Agriculture is often described as a controversy with weeds. Weeds are a factor in the management of all land resources but their impact is greatest in agriculture. Every geographic area is plagued by a complex of weed species therefore it is legitimate to be engaged in this weed war.

Over the past dozen years, a strong weed control program has been developed at the Northeast Station. Part of this effort is the annual evaluation of herbicide performance in corn and soybeans, the principal row crops grown in northeast Nebraska. From the applied research come herbicide recommendations to assist our agricultural producers in staying ahead of weed growth. These herbicide evaluation experiments also permit University weed researchers to look at experimental herbicide compounds. Often these new compounds find their way into the market place and become a basic part of weed control practices.

Weed control is often identified as a major obstacle to farmer adoption of conservation tillage crop production systems. The weed science program at the Northeast Station has been partially directed toward investigation of weed control in several conservation tillage systems. One example has been to compare weed control in the till-plant and the slot-plant systems of corn production.

Slot-planting is essentially a no-till corn production system which has



Russ Moomaw, Extension agronomist, studies the effectiveness of herbicides on corn seeded into oat stubble from the previous year.

attracted some interest and a few advocates in northeast Nebraska to reduce soil erosion losses. Research effort has also been directed toward developing weed control practices in no-till corn production in alfalfa sod and oat stubble. Soybeans can also be grown in such systems with the proper choice of a herbicide program.

Pasture is also a valuable resource in northeast Nebraska. Research effort has been directed toward using better weed control practices while establishing cultivated grass seedings, or to control weed growth in existing pasture land. Problem pasture weeds like leafy spurge need an expanded research effort.

Crop Variety Testing

Crop variety testing programs have received continual emphasis at the Northeast Station. Corn, soy-

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Pest management scout supervisor Keith Jarvi empties a light trap used to monitor European corn borer activity.

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beans, alfalfa, oats, barley, winter and spring wheat and sunflower variety performance tests are currently being conducted to keep farmers supplied with new and better varieties. The results of these tests are published annually in the Nebraska Cooperative Extension Service series of crop variety performance circulars.

Soil Fertility

Soil fertility research at the Northeast Station has been as varied as the soils and cropping systems used in northeast Nebraska.

Early soil fertility studies were directed toward determining fertilizer rates needed to produce maximum economic yields of corn, small grains and forage crops grown in the area.

As staff was added to the facility,

the activity in soil fertility research increased. Studies were expanded into the sandy soils of the area. Research was also initiated to measure the effectiveness of micronutrients for crop production on all soils in the area.

The face of crop production in northeast Nebraska changed in the late '60's when center pivot irrigation entered the crop production picture and irrigated acreage expanded rapidly. The expansion continued into the early '70's.

Soil fertility research was then expanded to include investigations into fertilizer management for irrigated corn, irrigated alfalfa, and irrigated pastures.

It's important to point out that the soil fertilizer research conducted at the Northeast Station throughout the years has not been independent of other research conducted throughout the state. The large majority of the studies undertaken have been coordinated with other researchers

at the other research stations in Nebraska. The end result of much of the soil fertility research is most evident in the fertilizer recommendations which are currently used by the UNL Soil Testing Laboratory.

In addition to being incorporated into fertilizer recommendations, the results of the soil fertility research are passed on to farmers through meetings and the use of the media.

Farming practices have changed over the years and methods of information delivery have also changed to keep pace with these changes. In northeast Nebraska, new and innovative approaches have been attempted through the support of soil fertility research.

These new approaches include corn clubs which focus on cost of production, corn production projects by 4-H clubs, individual consulting sessions for farmers, and farmer participation in educational efforts directed to reducing leaching of nitrate-nitrogen in the sandy soils. □



Extension soils specialist George Rehm prepares equipment for fertilizer tests as part of soil fertility research at the Northeast Station.