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## Agricultural Experiment Station News May 1983

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THE AGRICULTURAL EXPERIMENT STATION  
INSTITUTE OF AGRICULTURE  
AND NATURAL RESOURCES  
UNIVERSITY OF NEBRASKA-LINCOLN 68583-0704



# Agricultural Experiment Station News

May 1983

VOL 16 NO 8

## SEARCH COMMITTEE APPOINTED

**Irv Omtvedt** has announced the Search Committee for the Associate Director of the AES. Faculty representation on this committee was selected from a list of eight faculty names submitted by the AES Advisory Council. Selected by the Vice Chancellor, Deans and Directors, the committee represents a broad cross-section of inputs.

Members are: **Raedene Combs**, **Elbert Dickey**, **Earl Dickinson**, **Ron Raikes** (industry representative), **Sotero Salac**, **Lavon Sumption** and **Jim Williams**. Closing date for the position was May 15, 1983.

## AGRICULTURE ECONOMICS REVIEW

A departmental review was conducted in March for the Department of Agricultural Economics. Review team members external to the University were **Roland Robinson** from CSRS, **Kenneth Cassavant** from Washington State University, **Oscar Burt** from Montana State University, and **Gerald Doekson** from Oklahoma State University. Internal members of the review team were **James Kinder**, Department of Animal Science, **John Gradwohl**, College of Law, and **Azzeddine Assam**, Department of Agricultural Economics.

This committee reviewed extension, research and teaching programs. They encouraged the continuation of the strong extension program with further evaluation of the alternative methods to deliver extension material to clients. They noted the applied research program was very valuable to the State of Nebraska. An increase in the basic research and publications for the scientific community was suggested by the team. Teaching programs at the undergraduate level were considered to be effective. A further strengthening of the graduate program in economic theory and quantitative techniques was suggested to enhance the skills of the graduate students.

## NEW DISTRICTS FOR AES ADVISORY COUNCIL

The following nine districts and members have been designated to constitute the AES Advisory Council:

### *District*

1. Ag Econ; Food Science & Technology; **Dale G. Anderson** and **Khem M. Shahani**, terms expire 1984.
2. Ag. Engineering; Northeast Station; South Central Station; Southeast Ext./Rsch. Center; **James R. Gilley**, term expires 1985.
3. Agronomy; TBA, term expires 1986.
4. CAMaC; Entomology; Envir. Programs; Horticulture; TBA, term expires 1986.
5. Animal Science; **Austin J. Lewis**, term expires 1985.
6. Biometrics; Forestry, Fisheries and Wildlife; Veterinary Science; **Marvin B. Rhodes**, term expires 1984.
7. Ag. Biochemistry; Plant Pathology; TBA, term expires 1984.
8. Ag. Communications; Ag. Education; Education & Family Resources; Human Development & the Family; Human Nutrition & Food Service Management; Textiles, Clothing & Design; TBA, term expires 1985.
9. North Platte Station; Panhandle Station; TBA, term expires 1986.

To get on schedule, both **Dale Anderson** and **Khem Shahani** will continue to serve on the Council for the coming year and then one representative will be elected in 1984 to replace them from District #1. The new district distribution should ensure a broad cross-section representation as well as facilitate effective feedback to the faculty from the Council representatives.

The elections of members to fill the vacant positions on the Council will be held in May. Results of this election will be announced soon.

**Austin Lewis** and **Jim Gilley** provided the leadership for this effective redistricting plan.

## EFFECTS OF SCAB WHEAT ON BEEF CATTLE

In response to a question on the effects of scab wheat on beef cattle-toxicity and annual performance, three experiments were conducted by AES animal scientists **Terry Klopfenstein, Rick Stock, Dennis Brink, Mark Nelson, and Keith Dehaan**; and veterinary scientists **Norman Schneider, Alan Doster, and Michael Carlson**. One of these experiments was a toxicity trial, the other two were animal performance trials, carried out at the Mead Field Laboratory. Eighteen steers and 18 heifers were allotted to three toxicity treatments, 58 heifers and 60 steers were randomly allotted to nine pens and three performance treatments and 36 lambs were allotted to 12 pens and four performance treatments.

Results indicated that feeding high levels of vomitoxin (Deoxynivalenol - DON) caused no apparent toxicity problems or any marked decrease in animal performance. Much of the scab wheat produced in Nebraska was less than 10 ppm, most below 1 or 2 ppm. When levels in the total ration fed to cattle were 1 ppm, there was no effect on cattle performance. There should be no problem feeding scab wheat to cattle or sheep.

These feeding trials demonstrate the responsiveness of IANR researchers to a unique pathological problem which infested the 1982 winter wheat in southeastern Nebraska.

This emergency research project was partially funded by the Nebraska Wheat Board and the AES.

## A SUMMARY OF UPCOMING EVENTS

June 16, 1983, **South Central Station Field Day** - 1:30 p.m., Open House; 3:00 - Plant Demonstrations; 4:30 - Tours of experimental plots.

June 21-22, 1983, **Weed Science Tour**: This involves Concord, Lincoln and Clay Center. There is a **Western Weed Science Tour** on June 28-29, 1983. This will involve North Platte, Sidney and Scottsbluff.

June 28, 1983, **Open House at the Mead Sheep Unit** - University Field Laboratory. This event will probably be from 9:30 a.m. - 12:00 noon. This will involve the conclusions of the 1983 Nebraska Ram Test. **Bill Zollinger** is coordinating it.

July 28, 1983, **Ag. Engineering 32nd Annual Tractor Power & Safety Day** - University Field Laboratory. Theme: Engineering — Present and Future Trends.

August 9th - **Eighth University of Nebraska Turfgrass Field Day and Equipment Show** - University Field Laboratory.

September 17-18, 1983, **Forestry FieldDay** - Horning Farm at Plattsmouth.

## NATIONAL SCIENCE FOUNDATION PROJECT

Carbon dioxide concentration is increasing in the atmosphere. There is general agreement that further increase will lead to significant climatic change (or may have already done so). Prediction of the rates of future CO<sub>2</sub> trends in the atmosphere will require a better knowledge of the components of the carbon cycle than exists today.

A research project funded by a \$129,000 grant from the National Science Foundation has been underway since January 15, 1983 in which techniques will be evaluated and thoroughly field tested for measurements of rates of carbon dioxide exchange between the atmosphere and natural surfaces. Patterns of CO<sub>2</sub> concentration and flux representative of a large agricultural region will be measured to contribute to an increased understanding of the global carbon cycle. The principal investigators are **Shashi B. Verma** and **Norman J. Rosenberg** of the Center for Agricultural Meteorology and Climatology.

## UNIVERSITY GRANT APPLICATION ACTIVITY

A report recently made by **Harry Allen**, Director of Institutional Research and Planning, indicated that IANR was second to the College of Arts and Sciences in the percentage of the total number of University faculty applying for grants for the 1981-82 fiscal year through the Office of Research Services. Forty-seven percent of the total applicants (90) were from Arts and Science and 23 percent (43) from IANR. Of the total \$21,174,756 coming to the University, Arts and Science generated \$12,908,900. IANR was second with \$3,107,346. A & S has a total of 418 faculty compared to 290 for IANR. However, 22 percent of A & S faculty applied for grants compared to 15 percent for IANR.

## NEW OR REVISED PROJECTS

### NEB 10-090 - Economic Analysis of Water Management Strategies in Nebraska

This is a new Hatch project with an effective date of February 1, 1983. **R. J. Supalla** of the Agricultural Economics Department is the principal investigator. The objectives of this research are (1) analyze the farm level implications of irrigation under regulation induced limited water conditions, with emphasis on identifying optimum irrigation management practice, (2) assess the regional and community economic impacts of water management alternatives, with emphasis on economic output, employment and population and (3) evaluate the economic feasibility of financing selected water development alternatives for Nebraska's major river systems.

**NEB 10-091 - An Economic Analysis of Risk Management Strategies for Agricultural Production Firms**

This is a new Hatch project that contributes to regional research project S-180 with an effective date of January 1, 1983. **G. A. Helmers** and **D. Jose** of the Agricultural Economics Department are the investigators. The objectives of this study are (1) to develop and evaluate theories and methods for the analysis of farm firm behavior under risk and (2) to identify, analyze, and evaluate production, marketing, and financial strategies which farmers use or can use in risk management programs.

**NEB 10-092 - Analysis of Food and Agricultural Policies in an Uncertain Economic Environment**

This is a new Hatch project that contributes to regional research project NC-169 with an effective date of October 1, 1982. The project leaders are **G. A. Helmers**, **J. Kendrick** and **R. Frederick** of the Agricultural Economics Department. The objectives of the study are (1) to analyze the impacts of existing monetary/fiscal policies on the agricultural food sector, with particular emphasis on the implications for inflation, (2) to study constraints on farm product supply, rates of productivity, and the use of agricultural land and associated resources in an uncertain environment and (3) to evaluate the economic impacts of new, emerging food and agricultural programs and policies.

**NEB 12-131 - Dissipation and Bioavailability of Herbicides and Other Pesticides in Soil**

This is a new Hatch project with an effective date of March 1, 1983. **P. J. Shea** of the Agronomy Department is the investigator. The objectives of the research will be to (1) assess the impact of conservation tillage and changes in soil properties on herbicide dissipation and bioavailability, (2) characterize molecular mechanisms responsible for the absorption of specific pesticides and "bound residue" formation in soil, (3) determine the significance of precipitation reactions and complex formation between specific pesticides and soil or carrier solution ions, and (4) describe annual dissipation patterns and optimize degradation conditions for high input pesticides in storage pits.

**NEB 12-132 - Improving the Forage Quality of Grasses**

This is a new Hatch project with an effective date of March 1, 1983. **K. P. Vogel** of the Agronomy Department and **R. A. Britton** of the Animal Science Department are the principal investigators. The objectives of the research are (1) develop evaluation criteria and procedures for assaying forage quality parameters of forages adapted to the mid-continental U.S., (2) in conjunction with plant breeders utilize these procedures in breeding programs to improve the quality of forage crops and in the evaluation of advanced germplasm and (3) develop and evaluate management practices that will improve and/or maintain the quality of forages.

**NEB 14-028 - Bovine Viral Diarrhea Virus and Reproductive Failure in Cattle**

This is a new Animal Health project with an effective date of March 10, 1983. **C. L. Kelling**, **A. R. Doster**, **M. L. Frey**, **M. D. Rhodes** and **A. Torres-Medina** of the Veterinary Science Department and **S. R. Lowry** of the Biometrics and Information Systems Center are the principal investigators. The objectives of the research are (1) characterize strains of bovine viral diarrhea virus (BVDV) by analysis of the viral genome and determination of the antigenic variability of selected isolates of BVDV; (2) evaluate the pathogenicity of selected BVDV isolates selected on the basis of characteristics of their genomes and antigens; (3) correlate the pathogenicity of the selected isolates of BVDV with characteristics of their genomes and antigens; and (4) develop methods for prevention and/or control of reproductive failure in cattle.

**NEB 15-035 - Proteolytic Enzymes in Plant Senescence and Molecular Studies on Metalloproteases**

This is a new Hatch project with an effective date of April 1, 1983. **F. W. Wagner** of the Agricultural Biochemistry Department is the principal investigator. The objectives of this research are to study the metabolic events in soybean nodules which occur during senescence and the role of proteolytic enzymes in the catabolism of plant cell protein. The viability of nodule bacteroids and specific bacteroid proteins will also be studied. The mechanism of action of a bacterial metalloprotease will also be studied with regard to the functional groups in the protein which are involved in catalysis. Studies will also be undertaken to understand the function of the metal during catalysis.

**NEB 20-023 - Windbreak Shelter Effects**

This is a revised McIntire-Stennis project with an effective date of March 1, 1983. **J. R. Brandle** of the Forestry, Fisheries and Wildlife Department is the principal investigator. The objectives of this research are (1) to describe the effect of shelter on the pattern of growth and development of alfalfa and other forage crops under irrigated and dryland condition, (2) to determine the suitability of various trees and shrub species and varieties for use within windbreaks and (3) to evaluate the potential windbreak species with respect to drought tolerance.

**NEB 46-010 - Increased Efficiency of Sheep Production**

This is a revised Hatch project with an effective date of October 1, 1982. The principal investigators are **K. A. Leymaster**, **L. D. Young**, and **R. M. Koch** and **G. E. Dickerson** of the Roman L. Hruska U. S. Meat Animal Research Center and the Animal Science Department. The objective of this research is to develop methods for utilization of genetic variation among and within breeds.

### NEB 91-025 - Modification of Human Diets Designed to Affect Lipid Metabolism

This is a new Hatch project that contributes to regional research project NC-167 with an effective date of November 1, 1982. **C. V. Kies** of the Human Nutrition and Food Service Management Department is the principal investigator. The objectives of the research are (1) to compare in normal human subjects the effects of a dietary fat patterned after the USDA Intake Survey (USDA 77) with the effects of a dietary fat patterned after the Dietary Goals for the United States and (2) to utilize animal models to determine the impact of the USDA 77 and Dietary Goal diets on those metabolic parameters not easily measured in human subjects.

### NEB 26-003 - Biology and Control of the Zimmerman Pine Moth and Other Insect Pests of Forests in Nebraska

This is a new McIntire-Stennis project with an effective date of March 1, 1983. **M. O. Harrell** of the Forestry, Fisheries and Wildlife Department is the principal investigator. The objectives of this research are (1) to confirm the identification of *Dioryctria zimmermani* in Nebraska, (2) to determine the life history of *D. zimmermani* in Nebraska, (3) to determine whether infestation levels of *D. zimmermani* are correlated with tree stress, and (4) to evaluate chemical control methods for reducing the damage caused by *D. zimmermani*.

### GRANTS AND CONTRACTS

<b>Ball, E. M.</b> (Plant Pathology) - Potato Certification Service	445
<b>Ball, E. M.</b> (Plant Pathology) - State of Montana	400
<b>Brandt, J. R.</b> (Forestry, Fisheries & Wildlife) - Nebraska Railroad Assn.	750
<b>Britton, R. A.</b> (Animal Science) - Central Soya, Inc.	5,000
<b>Brumm, M. C.</b> (Northeast Station) - Nebraska Pork Producers Association	2,000
<b>Burnside, O. C.</b> (Agronomy) - Tennessee Valley Authority	7,500
<b>Burnside, O. C.</b> (Agronomy) - Shell Development Company	1,500
<b>Clemens, E. T.</b> (Veterinary Science) - Nebraska Pork Producers Association	2,000
<b>Compton, W. A.</b> (Agronomy) - Hoegemeyer Hybrids	12,300
<b>Compton, W. A.</b> (Agronomy) - Pioneer Hi-Bred	40
<b>Compton, W. A.</b> (Agronomy) - Northrup King	60
<b>Compton, W. A.</b> (Agronomy) - FFR Cooperative	800
<b>Compton, W. A.</b> (Agronomy) - Selected Seed Hybrids	5
<b>Coyne, D. P.</b> (Horticulture) - Rocky Mountain Bean Dealers Association	5,000
<b>Danielson, M. D.</b> (North Platte Station) - Nebraska Soybean Development, Utilization and Marketing Board	8,500
<b>DeShazer, J. A.</b> (Ag Engineering) - Nebraska Pork Producers Association, Inc.	3,000
<b>Flowerday, A. D.</b> (Agronomy) - Crow's Hybrid Corn Company	3,500
<b>Gustafson, W. A.</b> (Southeast Extension & Research Center) - Nebraska Nut Growers Association	1,500
<b>Hagen, A. F.</b> (Panhandle Station) - Monsanto Company	1,800
<b>Kamble, Shripat T.</b> (Environmental Programs) - NCR-PIAP	16,330
<b>Kleis, R. W.</b> (Dean and Director's Office) - USDA/CSRS	48,962
<b>Mandigo, R. W.</b> (Animal Science) - Tender Juicy Meat Company	200
<b>O'Keefe, R. B.</b> (Panhandle Station) - Nebraska Department of Agriculture (Potato Division)	5,000
<b>Omtvedt, I. T.</b> (Dean and Director's Office) - USDA/SEA/AR	81,100
<b>Omtvedt, I. T.</b> (Dean and Director's Office) - USDA/SEA/CR	42,687
<b>Peo, E. R.</b> (Animal Science) - Chr. Hansen's Laboratory, Inc.	6,000
<b>Peo, E. R.</b> (Animal Science) - Amax Chemical Corporation	7,680
<b>Peo, E. R.</b> (Animal Science) - Borden, Inc.	3,840
<b>Rhodes, M. B.</b> (Veterinary Science) - Nebraska Pork Producers Association	2,500
<b>Riordan, T. P.</b> (Horticulture) - Pursley, Inc.	700
<b>Rush, I. G.</b> (Panhandle Station) - Hoffmann-LaRoche, Inc.	7,500
<b>Shahani, K. M.</b> (Food Science & Technology) - J. Gordon Roberts	6,000
<b>Shea, P. J.</b> (Agronomy) - NCR-PIAP	16,500
<b>Stetson, L. E.</b> (Ag Engineering) - Nebraska Energy Office	7,200
<b>Stetson, L. E.</b> (Ag Engineering) - Norris Public Power District	790
<b>Stock, R. A.</b> (Animal Science) - Eli Lilly & Company	19,200
<b>Sullivan, T. W.</b> (Animal Science) - H. J. Baker & Bro., Inc.	3,600
<b>Swisher, B.</b> (Agronomy) - Anna H. Elliott Fund	7,100
<b>Watkins, J. E.</b> (Plant Pathology) - Chevron Chemical Company	1,000
<b>Wicks, G. A.</b> (North Platte Station) - Monsanto Ag Products Company	1,250
<b>Wicks, G. A.</b> (North Platte Station) - Shell Development Company	2,400
<b>Wilhite, D. A. and Rosenberg, N. J.</b> (Center for Ag Meteorology & Climatology) - National Science Foundation	3,678
<b>Wilson, R. G.</b> (Panhandle Station) - Eli Lilly & Company	1,250
<b>Wilson, R. G.</b> (Panhandle Station) - Monsanto Company	450
Total	\$349,017