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## ARD News February 1984

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



# Agricultural Experiment Station News

February 1984

VOL 17 NO 7

## RESEARCH GRANT OPPORTUNITIES

**NSF Biological Instrumentation.** Funds for the purchase of multiple user instruments for basic research in physiological, cellular and molecular biology. Can be for single items or multiple component systems costing between \$25,000 and \$400,000. Proposal deadlines occur twice yearly on April 30 and September 30.

**NIH Biotechnology Resources Program.** To support intermediate voltage electron microscopy and image analysis to be used in structure and function studies of whole cells and studies of substructural features of cells. For personnel, equipment, supplies and other costs necessary for establishment and operation.

**Resources for the Future Grants.** To fund research and education in the development, conservation and use of natural resources, including the quality of the environment. Applications due March 1, 1984.

Contact Research Services Office, 472-3171, for additional information on the above grants.

## DIRECTOR'S OFFICE RESPONSIBILITIES

The addition of **Dale Vanderholm** as a full-time Associate Dean and Associate Director enhances the leadership capabilities of the IANR Agricultural Research Division. Although additional shifting of responsibilities may occur over time, some delineation of the primary responsibilities within the Director's Office is appropriate as a result of Vanderholm's arrival and the pending implementation of the reallocation recommendations.

The Director's Office will emphasize facilitating innovative and productive research that addresses priority problems facing Nebraska's agricultural industry. Another goal is that of providing an administrative environment that will foster research programs which contribute to a broader knowledge base and enhance quality of life opportunities for rural Nebraskans.

Although the personnel in the Director's Office will work as a team in administering the overall program, primary leadership for some of the major program areas will be divided as follows:

Administrator	Responsibilities
<b>Irv Omtvedt</b> Director 100%	<ul style="list-style-type: none"> <li>• Appropriated Budgets</li> <li>• IANR Comprehensive Reviews</li> <li>• Livestock Check-Off Boards</li> <li>• Personnel Matters</li> <li>• Primary Program Areas:               <ul style="list-style-type: none"> <li>* Animal-related</li> <li>* Biometrics &amp; Communications</li> <li>* Economics &amp; Education</li> <li>* Home Economics</li> </ul> </li> </ul> <p style="text-align: center;">★ ★ ★ ★ ★</p>
<b>Dale Vanderholm</b> Associate Director 100%	<ul style="list-style-type: none"> <li>• Grain Check-Off Boards</li> <li>• Grants and Contracts</li> <li>• IANR Patents</li> <li>• IANR Facilities<sup>1/</sup></li> <li>• Primary Program Areas:               <ul style="list-style-type: none"> <li>* Engineering</li> <li>* Plant-related</li> <li>* Biotechnology</li> <li>* Food Science and processing</li> <li>* Natural Resources</li> </ul> </li> </ul> <p style="text-align: center;">★ ★ ★ ★ ★</p>
<b>Bob Kleis</b> Assistant Director 20%	<ul style="list-style-type: none"> <li>• International Research</li> <li>• ESCOP Representative</li> </ul> <p style="text-align: center;">★ ★ ★ ★ ★</p>
<b>Warren Sals</b> Assistant Director 20%	<ul style="list-style-type: none"> <li>• AES Operations</li> </ul>
<p><b>John Woodward</b> is currently budgeted 48% as Assistant Director for Home Economics Research. However, plans are underway as a result of the reallocation process to transfer his research appointment to the Department of Human Development and the Family which will permit him to reactivate his research program. He will continue to serve as Associate Dean of Home Economics and as an administrative advisor on North Central regional research projects in the Home Economics area.</p> <p><b>Bill Powers</b>, as Director of the Water Resources Center, works closely with the Director's Office in coordinating water-related research projects.</p> <p><sup>1/</sup> Responsibilities will be gradually shifted from T. E. Hartung to Vanderholm.</p>	

## FACULTY DEVELOPMENT LEAVES

### Welcome Back

**Steve Lowry**, Biometrics and Information Systems Center, spent fall semester at the Biometrics Unit, Cornell University. Lowry prepared a manuscript on statistical methods for Agr 801, audited four courses, and consulted on a human nutrition project.

**Dean Linsenmeyer**, Agricultural Economics, spent July-December, 1983, at the Market Research Division of The Andersons in Toledo Ohio. This leave enabled him to complement his academic preparation in grain marketing. He revised his Agr. Economics 311 Advanced Marketing class to include marketing strategies and alternatives from an elevator manager's point of view.

### Pending Leaves

**John DeFrain**, Human Development and the Family. Fall 1984, Seattle Washington to prepare a manuscript on stillbirth and work on a child custody handbook.

**James Gilley**, Agricultural Engineering. Spring 1984, The Catholic University in Belgium, to teach a graduate course and visit other institutions. This leave will provide Gilley additional expertise and background in the application of crop modeling to the optimum scheduling of irrigation and use of computers in the improvement of irrigation management.

**Fred Roeth**, South Central Station. October 1984 to April 1985, University of California, to conduct research in weed seed biological techniques concerning dormancy, germination and longevity of weeds.



## CHECK-OFF BOARD PROPOSALS

A total of 92 research project proposals were submitted to the **Corn, Grain Sorghum, Soybean and Wheat Development, Utilization and Marketing Boards** for funding consideration effective July 1, 1984. These proposals were reviewed in detail in December by the respective research and education coordinating committees and project leaders were given an opportunity to incorporate suggested revisions. The Boards will be reviewing the proposals approved and submitted to them at their up-coming meetings.

While reduced income may reduce the total funding available this year, this is an important source of research support for IANR. Even though all of the projects will not be funded, the process provides an opportunity to expose Nebraska agricultural leaders to the scope and variety of agricultural research at UNL. Special appreciation is extended to those who submitted proposals and/or served on the coordinating committees.

## GOVERNOR'S BUDGET RECOMMENDATIONS

Governor Kerrey's budget request for 1984-85 included the following major items that should be of particular interest to IANR and the Agricultural Research Division personnel:

- \* An 8% salary base increase.
- \* An increase in operational budget for telephone, postage, computers, and special equipment. No increase in travel budget.
- \* An increase in health insurance funding.
- \* \$3.2 million for the Animal Science Complex.

## AGRICULTURAL RESEARCH BROCHURE

A new brochure giving an overview of Nebraska's Agricultural Experiment Station research program was published in December. It briefly covers research thrusts in 10 program areas and includes information on the administrative structure and research locations. Special appreciation is extended to **John L. Adams** and **Eloise Wilson** in Agricultural Communications. Adams summarized the primary research thrusts from the 300 active projects and Eloise was responsible for the layout and design. The brochure folds to 4' x 9' and is convenient for mailing. Persons desiring a supply of the brochures for distribution or display should contact the Agricultural Communications Department.

## NEW MICROCOMPUTER SUPPORT STAFF

Three new staff have been added to the microcomputer area of the Biometrics and Information Systems Center during the past two months.

**Don Mihulka**, Information Systems Analyst, will help in staff training, departmental computing needs, and system and software design and evaluation. Don is a UNL graduate with a major in Computer Science and has previous experience with an engineering consulting firm.

**Michael Ruhrdanz**, Programmer Analyst, will help with staff training, software evaluation and development, and hardware selection and customization. Mike completed his Computer Science degree at UNL in December.

**Deb Bockus** is a part-time Programmer Analyst whose primary responsibility is staff training, particularly in the areas of word processing and electronic spreadsheets. Deb has a degree in Computer Science and is presently working on a degree in Industrial Engineering.

These new employees, as well as **Jim Emal**, Microcomputer Specialist, are all partially supported by the Agricultural Research Division and are available for consultation by calling the Biometrics Center Office.

## REALLOCATION UPDATE

The IANR submitted 14 programs totaling \$567,500 for consideration in the reallocation process. These will be received by the Board of Regents at their February meeting and implementation will depend on Board action. Those directly affecting the Agricultural Research Division include:

- \* Transfer of research programs from Southeast Extension and Research Center to discipline departments involved.
- \* Eliminate Assistant Director position in Home Economics and transfer to research position in Human Development and the Family.
- \* Eliminate plant disease research position in Horticulture.
- \* Eliminate waste management research program in Agronomy.
- \* Transfer poultry products research program from Animal Science to Food Science and Technology.
- \* Redirect food flavors and evaluation program in Food Science and Technology to food processing engineering.
- \* Reduce the analytical services laboratory support in Agricultural Biochemistry.

Although many of these reallocations may be stressful, it is believed that these changes will not adversely affect the research program in the long run.

## AGRICULTURE 2001 RECOMMENDATIONS

The Summary of the six **AGRICULTURE 2001** Task Force Reports was unveiled on January 13, 1984 and presented to the Board of Regents on January 14, 1984. Faculty and staff are encouraged to read the Task Force recommendations for Agricultural Business and Financial Management, Crops, Human Resources, Livestock, Marketing and Utilization, and Natural Resources. A complete set is available in each IANR administrative unit. Priorities highlighted in Summary Report include:

- \* Quality Education
- \* Agricultural Marketing and Utilization
- \* Water and Land Management
- \* Agricultural Management Systems
- \* Agricultural Production Technology
- \* Capital Facilities
- \* Basic Research

**Vice Chancellor Arnold** has invited funding proposals to be submitted to him for consideration by the University of Nebraska Foundation in addressing priorities stemming from the Task Force recommendations. The Board of Regents has requested an implementation plan for their March meeting. Meetings are currently being planned both on campus and off-campus during April to give IANR faculty an opportunity to discuss the recommendations and implementation plans.

## CAMaC COMPREHENSIVE REVIEW

A comprehensive review of the Center for Agricultural Meteorology and Climatology (CAMaC) was conducted September 18-22, 1983. The Review Team consisted of **Robert F. Dale** of Purdue University (Chairman); **Jon F. Bartholic**, Michigan State University; **Clarence Sakamoto**, NOAA's Center for Assessment and Information Services, Columbia, Missouri; and **Thomas L. Thompson**, Agricultural Engineering Department. **Robert H. Stoddard**, Department of Geography, served as the Academic Planning Committee representative.

The Review Team was pleased with CAMaC's field research programs and its applied research on agroclimatology. The data information systems and the Agricultural Climate Situation Committee were mentioned for providing practical support for agriculture in Nebraska. CAMaC's Automated Weather Data Network was termed "the most advanced in the nation."

Review Team recommendations included:

- \* Increase interdisciplinary involvement.
- \* Provide additional coursework in agroclimatology.
- \* Place more emphasis on CAMaC Extension programs and investigate cost recovery mechanisms.

The Center received many useful ideas and has already taken steps to implement some of the Review Team recommendations.

## NEW EMPLOYEE

The "voice" on the other end of the line for most calls to the Director's Office is that of **Jan Radenslaben**. Jan is the receptionist and Dale Vanderholm's secretary. Her previous experience in the Entomology Department, the Cooperative Extension Director's Office and most recently in the IANR Finance Office makes her exceptionally well qualified to serve the Agricultural Research Division.

## IANR GRANTS

IANR received 296 of the 479 grant awards for UNL during July 1, 1983 through December 31, 1983. The IANR grants accounted for \$4,427,890 (46.6%) of the UNL total of \$9,493,891 for this period.

Distribution by IANR Division is:

Research	\$3,733,044	84.3%
Teaching	82,269	1.9%
Extension	492,877	11.1%
Water Resources	8,700	.2%
Conservation and Survey	111,000	2.5%
Total	\$14,427,890	100.0%

## PROJECT REVIEW ACCOMPLISHMENTS

20-036

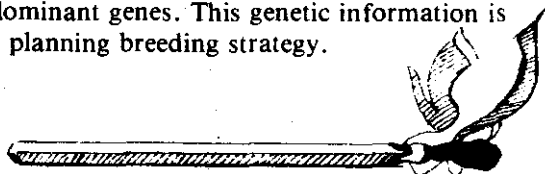
**Title: Genetics, Breeding and Cultural Interactions of Beans**

**Leader: Dermot P. Coyne**

The Nebraska released Great Northern (GN) varieties resistant to common blight and/or bacterial wilt yielded 10-14% more than standard varieties and accounted for 50-60% of the GN acreage. Several high yielding, high quality GN and Pinto breeding lines possessing tolerance to common blight and white mold diseases are currently being considered for release in the near future.

Reactions to the pathogens causing white mold and common blight diseases were quantitatively inherited. A simply inherited hypersensitive reaction to the common blight pathogen was detected and this should improve selection efficiency. The low heritability of the reaction to white mold was found to be due to intergenotypic competition in segregating populations using blends of near-isogenic lines of differing plant habit and flowering times.

Resistance to bean seed coat cracking was associated with uniformly thick seed coats along with a greater area of adhesion of the seed to the cotyledon. Scanning electron microscopy indicated that the desired bright white GN bean seed coats had a continuous layer of wax and was determined by two enhancer genes. Resistance to iron deficiency leaf chlorosis in calcareous soils was determined primarily by two dominant genes. This genetic information is useful in planning breeding strategy.



94-009

**Title: Characteristics of Clothing-Related and Interior Product-Related Burn Injuries**

**Leader: Joan Laughlin.**

Textile and apparel industry representatives and the National Advisory Committee for the Flammable Fabrics have requested the Consumer Product Safety Commission to gather more accurate data on burn injuries. This study, based on Nebraska burn incidents, revealed mortality rates of 31% when clothing was involved and 57% when interior products were involved.

More males were involved in these accidents than would be expected, given their share of the Nebraska population. Children under nine years of age and females across all age categories had fewer accidents than would have been expected; while teenagers and young males (10-35), as well as elderly males (65 +), suffered significantly more accidents than would have been expected.

Pants/trousers and shirts/blouses were involved in more of these accidents than any other clothing items.

Among teenagers more "social" accidents than "alone" accidents occurred, while the reverse was found for those over 65 years of age. The ignition source was important in avoiding accidents, but frequently the injury was caused by inhalation of toxic gases and asphyxiation, rather than by thermal burns.

## RESEARCH GRANTS AND CONTRACTS RECEIVED (December 1, 1983 to January 25, 1984)

<i>Agricultural Economics</i>	
Johnson, B. B. - Federal Land Bank	\$3,000
<i>Agricultural Engineering</i>	
Stetson, L. E. - Nebraska Rural Electric Assn.	2,000
<i>Agronomy</i>	
Burnside, O. C. - ICI Americas, Inc.	5,000
<i>Animal Science</i>	
Brink, D. R. - A. H. Robins Co.	16,400
Eldridge, F. E. - American Breeders Service	1,080
Froning, G. W. - American Cyanamid Co.	5,000
Kinder, J. E. - Nat'l Assn. of Animal Breeders	7,500
Klopfenstein, R. J. & Britton, R. - Fats & Protein Rsch. Assn.	14,700
Owen, F. G. - Tennessee Eastman Co.	3,595
Owen, F. G. - Eastman Kodak Co.	5,000
Peo, E. R., Jr. - A. H. Robins	15,000
Peo, E. R., Jr. - Monsanto Co.	9,600
Sullivan, T. W. - Smith Kline Animal Health Products	4,000
<i>Entomology</i>	
Mayo, Z. B. - Union Carbide Agr. Products Co., Inc.	750
<i>Environmental Programs</i>	
Gold, R. E. - Dow Chemical Co.	3,000
<i>Food Science and Technology</i>	
Handel, A. P. III - Lucas Meyer	150
Satterlee, L. D. - Milton G. Waldbaum Co.	250
Shahani, K. M. - Nestle Coordination Center for Nutrition	2,000
<i>Forestry, Fisheries and Wildlife</i>	
Brandle, J. R. - Center for Rural Affairs	6,000
Harrell, M. O. - USDA Forest Service	15,000
<i>Human Nutrition and Food Service Management</i>	
Kies, C. V. - Ross Laboratories	4,466
<i>North Platte Station</i>	
Deutscher, G. H. - The Upjohn Company	2,500
Hudson, D. B. - Philips Roxane, Inc.	2,775
Lindgren, D. T. - American Penstemon Society	155
<i>Northeast Station</i>	
Brumm, M. C. - Distributors Processing	3,000
Mader, T. L. - Diamond Laboratories	3,000
Moomaw, R. S. - PPF Industries, Inc.	500
<i>Panhandle Station</i>	
Havlin, J. - Union Carbide	400
Nelson, L. A. - Cenex Farmers Union Central Exchange	200
O'Keefe, R. B. - NE Dept. of Agr., Potato Division	6,500
Wilson, R. G. - ICI Americas, Inc.	200
<i>Plant Pathology</i>	
Partridge, J. E. - Rockefeller Foundation	60,000
<i>Southeast Extension and Research Center</i>	
Gustafson, W. A. - Northern Nut Growers Assn.	500
<i>Veterinary Science</i>	
Schneider, N. R. - Modern Veterinary Products	325
TOTAL	\$203,546



**NEBRASKA AES RESEARCH EXPENDITURES  
(October 1, 1982 - September 30, 1983)**

Source	Amount	%
<b>Federal Formula Funds</b>		
Hatch	1,939,482	
Regional Research	758,378	
McIntire-Stennis	88,548	
Animal Health	192,602	
<b>Total Federal Formula</b>	<b>\$ 2,979,010</b>	<b>10.6</b>
<b>University of Nebraska Appropriation</b>	<b>10,701,009</b>	<b>38.2</b>
<b>Grants and Contracts</b>		
USDA Cooperative Agreements	1,882,841	
USDA Special and Competitive	469,692	
Federal Grants (NSF, NIH, etc.)	692,572	
Industry Grants	1,959,397	
<b>Total Grants and Contracts</b>	<b>5,004,502</b>	<b>17.9</b>
<b>Product Sales</b>	<b>9,326,591</b>	<b>33.3</b>
<b>TOTAL EXPENDITURES</b>	<b>\$28,011,112</b>	<b>100.0</b>

**NEW OR REVISED PROJECTS**

**12-135**

**Title: Soil Productivity and Erosion**

**Leader: David T. Lewis, Agronomy**

OBJECTIVES: Assess the effect of erosion and modified soil physical properties on potential productivity of selected soils under rainfed conditions, with emphasis on evaluation of physically based simulation models. New Hatch project effective October 1, 1983 that contributes to NC-174.

**13-055**

**Title: A Systems Approach to the Evaluation of Environmental Constraints Affecting Poultry Production**

**Leaders: Mary M. Beck, Animal Science  
James A. DeShazer, Agricultural Engineering**

OBJECTIVES: (1) To develop a comprehensive mathematical model of poultry production for use by commercial producers. (2) To determine basic cellular and systemic responses to environmental factors. Revised Hatch project effective October 1, 1983 that contributes to NE-127.

**15-039**

**Title: Associative Nitrogen Fixation in Nonleguminous Plants**

**Leader: Robert V. Klucas, Agricultural Biochemistry Department**

OBJECTIVES: (1) To determine microbiological, physiological, and environmental characteristics responsible for active N<sub>2</sub>-fixing association between bacteria and nonleguminous plants. (2) To identify genetic variability in bacterial and plant germplasms which enhance the association between N<sub>2</sub>-fixing bacteria and nonleguminous plants. (3) To determine whether selected genotypes of bacteria and nonleguminous plants can be used to provide fixed nitrogen to plants. New Hatch project effective October 1, 1983 that contributes to S-187.

**16-027**

**Title: Food Quality and Energy Usage in Food Service Systems: Microwave and Convection Thermal Processing**

**Leader: R. Burt Maxcy, Food Science & Technology**

OBJECTIVES: (1) To establish parameters necessary for conserving nutritional and sensory qualities and for maintaining microbial and chemical safety of foods which are prepared using microwave and convective thermal processing and foodservice systems. (2) To establish parameters for control of microbial contaminants on the surfaces of food where there is a public health risk. Revised Hatch project effective October 1, 1983 that contributes to NC-120.

**17-030**

**Title: Management Strategies for Leafhoppers, Spittlebugs and Aphids on Alfalfa**

**Leader: George R. Manglitz, USDA and Entomology**

OBJECTIVES: (1) To study the biology and population ecology of homopterous pests of alfalfa, stressing quantitative data. (2) To improve methodologies and to investigate the impact of homopterous pests of alfalfa. (3) To integrate the results of these studies into pest management programs and ascertain practical implementation procedures. Revised Hatch project effective October 1, 1983 that contributes to NC-149.

**20-036**

**Title: Genetics, Breeding and Cultural Interactions of Dry Edible Beans**

**Leaders: Dermot P. Coyne, Horticulture  
James R. Steadman, Plant Pathology  
Anne K. Vidaver, Plant Pathology  
David S. Nuland, Panhandle Station**

OBJECTIVES: (1) To determine germplasm sources and genetics of resistance and breed for resistance to the pathogens causing the diseases, common blight, halo blight, brown spot, white mold, and rust. (2) To determine the genetics of resistance to iron-induced leaf chlorosis and photoperiod x temperature interactions for flowering and plant habit stability. (3) To investigate the physical basis, genetics of and to breed for improved seed coat cracking resistance, more uniform and rapid water entry into seeds, and uniform brighter white seed coats of Great Northern beans. Revised Hatch project effective November 4, 1983.

**23-002**

**Title: Statistical Computing Methodology for Research Planning and Analysis**

**Leader: Walter W. Stroup, Biometrics Center**

OBJECTIVES: (1) To compare different methods of computing estimates of biological parameters and their variances and compare methods of testing hypotheses for general unbalanced mixed models. (2) To develop computational strategies which would yield reasonable solutions to general unbalanced mixed model problems. New Hatch project effective October 1, 1983 that contributes to S-189.

**24-020**

**Title: An Assessment of Professionalism and Leadership of Nebraska Vocational Agricultural Educators**

**Leader: Alan G. Blezek, Agricultural Education**

OBJECTIVES: (1) To assess the present degree of professionalism within the profession. (2) To measure the leadership potential of present agricultural educators. (3) To determine the relationship between professionalism and leadership potential. (4) To identify areas needing more attention in the undergraduate and graduate professional teacher education classes. New Hatch project effective October 19, 1983.