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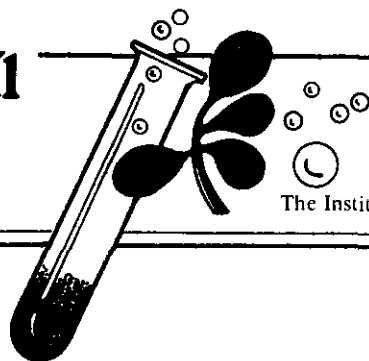
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June 1994

Volume 28, Number 6

COMMENTS FROM THE DEAN

Dear Colleagues:

The end of the fiscal year provides an excellent opportunity for administrators to examine the changes that have occurred in their units during the recent past. A study of the number of personnel whose salaries are provided through ARD has revealed that faculty FTEs on state-appropriated funds have decreased by 14.5 during the past five years, to 132.1 FTEs. During this time period, support staff FTEs on state-appropriated funds have increased by 12.1 and total employees paid from state-appropriated funds have decreased by 2.8 FTEs. Even though ARD has experienced two budget reductions during the past five years, our total number of employees on state funding has remained almost level (currently 494.4 FTEs).

Personnel paid from grant, contract or revolving funds have increased significantly during the past five years. There are currently 11.7 faculty FTEs on "soft" funds (an increase of 4.9 FTE). Support staff and total employees paid from grant or revolving funds have increased by 41.2 and 46.1 FTEs, respectively. The total number of support staff FTEs on "soft funds" is currently 256.9. The total number of FTEs paid on all sources of funds has increased during the past five years by 43.7, to 763. This increase in personnel paid from "soft" funds helps explain the office and laboratory space shortage and parking deficiencies that have developed on East Campus.

One faculty member inquired about the cost of administering ARD research programs. An analysis of expenditures for the ARD office; unit administrator and interdisciplinary center director salaries; and salaries and wages for administrative assistants, executive secretaries and accounting personnel paid on the ARD budget showed that \$1.54 million is being spent in the current fiscal year. This amount represents 6.3 percent of the state appropriated budget, 5.4 percent of the "hard" dollar budget, and 3.4 percent of total expenditures for research. We believe that administrative costs in ARD are reasonable for the size and diversity of our programs.

If you have any questions about our research program, please contact Dale Vanderholm or me. We would be pleased to provide you with any information that is currently available or could be developed.

*Darrell W. Nelson
Dean and Director*

UNL RANKING FOR TOTAL RESEARCH AND DEVELOPMENT EXPENDITURES

For fiscal year 1992, UNL ranked 70th in total research expenditures (\$91.4 million) among all universities and colleges. We ranked 47th among all public universities and colleges. During fiscal year 1992, ARD expenditures were \$43.9 million (about 48 percent of the UNL total).

Research expenditures at other comparable universities were: Purdue University, \$140.3 million; Iowa State University, \$132.6 million; Oregon State University, \$107.6 million; University of Missouri, \$97.2 million; Colorado State University, \$88.1 million; Washington State University, \$85.1 million; and Oklahoma State University, \$71.2 million.

NATIONAL RESEARCH AND DEVELOPMENT EXPENDITURES IN 1993

Approximately \$161 billion were spent during 1993 on Research and Development (R & D) in the U.S. The sources of the Research and Development funds were: industry, 52 percent; federal government, 42 percent; and other, 6 percent. The organizations/agencies performing Research and Development were: industry, 68 percent; universities, 13 percent; federal labs, 10 percent; federally-funded research centers at universities, 5 percent; and other, 3 percent. The type of work conducted: development, 59 percent; applied research, 25 percent; and basic research, 16 percent. As is apparent, research and development is a very big business in the U.S.

ANNUAL RESEARCH PROJECT REPORT FORM AD-421

Every active approved ARD project is entered into the USDA Current Research Information System (CRIS) database maintained at the National Agricultural Library in Beltsville, Md. As part of this system, each faculty member is required to submit an annual progress report on USDA form AD-421 which is then entered into the CRIS system where it is available to fellow research scientists and administrators on a nationwide basis, and also to the public



worldwide through Bitnet and/or Internet. ARD faculty are encouraged to make use of this data base when planning new or revised research projects to avoid duplication, to determine other related activity, and perhaps to establish personal contacts. Recent communication from USDA has indicated that the CRIS data base frequently is being accessed by non-scientists, and the particular example cited was more frequent accessing by members of congress and their staffs.

The point in this communication was to emphasize that good quality reports are important because these reflect not only on the agriculture research system in general, but also on our individual institutions and faculty. This issue has federal funding implications as well as credibility implications for agricultural research.

Another point was that the narrative part of the progress report is read not only by scientists but also by laypersons. If the report is written only in terms that peer scientists would understand, the value to others is significantly diminished. For this reason, faculty are encouraged to write reports that not only list findings and accomplishments that are meaningful to other scientists, but also include language that can effectively communicate to the non-scientific audiences. ARD faculty are encouraged to keep this in mind when the next cycle of progress reporting occurs.

ARDC RESEARCH AND EDUCATION BUILDING INITIATION OF CONSTRUCTION CELEBRATION

Approximately 240 people attended the ARDC "Initiation of Construction" celebration titled "Seeding a Vision for the Future" on May 13, 1994. Speakers included Irv Omtvedt, Vice Chancellor IANR; Graham Spanier, Chancellor UNL; L. Dennis Smith, President UN; Nancy O'Brien, Vice Chair UN Board of Regents; Mark Gustafson, ARDC Community Liaison Committee Representative; Darrell W. Nelson, Dean and Director of ARD; Warren Sahs, former Superintendent of ARDC; and Dan Duncan, Director of the ARDC. At the conclusion of the speakers' comments, everyone attending the ceremony scattered a handful of native grass seeds in an area that can be viewed from the internal courtyard of the new building. The seed was then raked in by the speakers, symbolically "Seeding a Vision for the Future."

The ARDC staff would like to extend their appreciation to everyone who attended and/or helped make the event successful.

SPECIAL RESEARCH GRANT PROGRAM AWARDS

Interdisciplinary Research Projects

The Agricultural Research Division funded five proposals for fiscal year 1994-1995. There were 26 proposals submitted. Funding for this program is made available to one

or more interdisciplinary research groups on an annual basis. Projects are designed to provide integrated research results that contribute to the role and mission of the IANR Agricultural Research Division. The five projects that were awarded are as follows:

- G. E. Duhamel — *Veterinary and Biomedical Sciences* — \$20,000, (year 1 of 2) "Synergism between *Bacteroides* spp. and *Serpulina hyodysenteriae* in swine dysentery: A Model of inflammatory bowel disease modulation of anaerobic bacteria"
- Durward Smith — *Food Science & Technology* — \$10,700, (year 1 of 2) "Insect and mechanical damage control during shipping by insecticide infusion and modified atmospheric packing"
- John A. Smith — *Biological Systems Engineering* — \$11,300, (year 1 of 2) "New seedbed preparation technology for improved sugarbeet emergence"
- Clinton Jones — *Veterinary and Biomedical Sciences* — \$20,000, (year 1 of 2) "How does the fungal toxin, fumoninin, induce carcinogenesis?"
- Pat J. Shea — *Agronomy Department* — \$20,000, (year 1 of 2) "Impact of pesticide residues in composted lawn waste on vegetable crops"

International Travel Program

Nine proposals for funding by the International Travel Program were received by ARD. Limited foreign travel funds (up to \$1,000) are provided by the Agricultural Research Division to ARD faculty and to non-ARD faculty (with sufficient evidence of ARD-related activities) to pursue professional development opportunities. The ultimate long-term goals of this program are to enhance research expertise in priority areas, increase external grant support, improve the Division's effectiveness and efficiency, and develop new cooperative programs. There were three proposals selected for travel during July 1 - Dec. 31, 1994:

- Wayne E. Woldt — *Biological Systems Engineering* — \$950, "Modeling groundwater flow systems using fuzzy set theory" in Karlsruhe, Germany
- Terry L. Mader — *Northeast Research and Extension Center* — \$1,000, "Environmental stress on feedlot cattle" Faculty Development Leave — Lawes, Queensland, Australia
- John DeFrain — *Family and Consumer Science* — \$1,000, "Family Strengths and Challenges in the South Pacific: A

study of 12 island nations” — South Pacific

Innovative and High Risk Research Proposal

Two Innovative and High Risk Research proposals were received for the second quarter. This particular program is designed to fund very innovative research projects with the object of developing data that can be used to support requests for external grants. These proposals can be submitted at any time during the year. These proposals will be evaluated quarterly by a subcommittee of the ARD Advisory Council. The following project was funded by the ARD Advisory Council for July 1, 1994.

J. E. Partridge — *Department of Plant Pathology* — \$15,000, “A virulence gene D from *Pseudomonas* is a suicide gene”

Burlington Northern Endowment for Water Research

Nine proposals were received for the Burlington Northern Endowment Grant. The Burlington Northern Endowment Grant was established in the University of Nebraska Foundation in 1982 to support water and irrigation research projects. The endowment was used originally to support an energy and water efficiency irrigation project. Three proposals were approved for funding as follows:

Garald Horst — *Horticulture Department* — 1st yr, \$23,104; 2nd yr, \$23,328; “Research on irrigation management to minimize chemical movement below turfgrass”

C. Dean Yonts — *Panhandle Research and Extension Center* — 1st yr, \$17,500; 2nd yr, \$19,500; “Control of pesticides and nitrates in surface irrigation runoff water”

Thomas G. Franti — *Biological Systems Engineering* — 1st yr, \$20,000; 2nd yr, \$20,000; “Evaluation of agricultural management practices for reduction of atrazine and other agrichemicals in surface water”

University of Nebraska Foundation Awards

Each year the University of Nebraska Foundation provides about \$400,000 to the University of Nebraska System for support of “cutting edge” programs of special interest to Nebraskans. Traditionally most of the funding has been used to purchase research equipment. This year the great bulk of funding was provided for “programs and activities that will contribute to the excellence of the University.” Thanks to all faculty who submitted proposals to the UN Foundation grant program. The two proposals that were selected are:

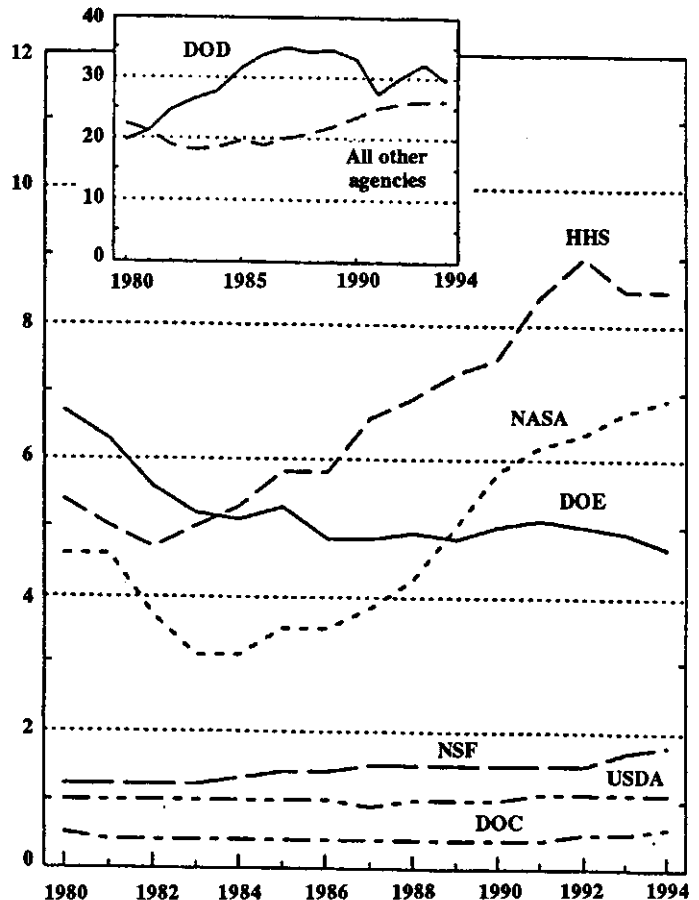
Amit Mitra — *Department of Plant Pathology* — \$49,500, “Transfer of an antiviral gene to wheat and barley”

James Schepers — *Department of Agronomy* — \$41,500, “Crop sensors — the next generation of nitrogen management tools to protect groundwater quality”

FEDERAL RESEARCH AND DEVELOPMENT OBLIGATIONS BY AGENCY

The figure below provides information on the Research and Development funding provided by various federal agencies during the time period 1980 to 1994. These data have been corrected to constant 1987 dollars to account for inflation. Funding for health and space research has increased significantly in real dollars during the past decade, whereas USDA funding has been very flat. NSF has obtained a small increase in funds whereas DOE funding has decreased significantly.

Billions of constant 1987 dollars



See appendix table 4-10.

Science & Engineering Indicators — 1993

FEDERAL EXPENDITURES FOR RESEARCH AND DEVELOPMENT — FY 1994

Presented below is information concerning all federal expenditures for research and development during FY 1994. Defense continues to consume a major portion of the Research and Development expenditures, but a modest proportion of the funds is invested in basic research. Expenditures for basic research are heavily slanted toward health and general science areas. Agricultural and environmental research obtain very small proportions of federal research funds.

Budget Function	Federal R & D	Basic Research
	-----of total expenditures-----	
Defense	59	9
Health	15	40
Space	9	10
General science	4	20
Energy	4	7
Environment	3	3
Agriculture	2	4
Other	5	7

Science and Engineering Indicators - 1993; National Science Board, NSF

TRENDS IN PH.D.s AWARDED IN AGRICULTURAL SCIENCES

Given in the table below are data concerning the number of Ph.D. degrees awarded in agricultural sciences during 1980 and 1991. These data point out the changes that are occurring in our graduate education programs with the advent of biotechnology and a shift to more fundamental research. The data also reflect the demand for doctoral-trained scientists in various fields.

	1980	1991
Applied Agricultural Sciences:		
Animal science	244	198
Veterinary medicine	41	56
Agronomy	151	203
Soil science	79	102
Plant pathology	118	92
Horticulture	73	78
Agricultural economics	160	165
Food science & technology	102	149
General agriculture	92	30
Natural resources & environment	153	217
Agriculturally-Related General Science:		
Biological sciences*	1,878	2,241
Plant genetics & physiology; botany	196	243
Animal genetics & physiology; immunology; nutritional science	663	834
Economics & econometrics	767	877

* includes biochemistry, biophysics, ecology, entomology, molecular biology, genetics, microbiology, and cell biology.

Data extracted from Huffman (1993) Trends and market for agricultural R&D, available scientists, and new scientists. In U.S. Agricultural Research: Strategic Challenges and Options. Agricultural Research Institute, Bethesda, Md.

PROPOSALS SUBMITTED FOR FEDERAL GRANTS

The following is a listing of proposals that were submitted after April 1, 1994 by faculty for federal grant programs. While not all grants will be funded, we applaud the faculty member's effort in submitting proposals to the various agencies.

Kyle D. Hoagland — U.S. Fish and Wildlife Service — Efficacy of Organic Matter Addition to the Missouri River to Increase Secondary Production — \$39,243

Kyle D. Hoagland — U.S. Fish and Wildlife Service — Effects of Insecticides on Benthic Macroinvertebrates in Nebraska Wetlands — \$18,354

Bob G. Volk and James S. Schepers — U.S. Department of Agriculture/Agricultural Research Service — Integrated Nitrogen, Water, and Pesticide Management Systems to Protect Groundwater Quality — \$200,000

P. Stephen Baenziger — U.S. Department of Agriculture/Agricultural Research Service — Utilization of Beef Cattle Feedlot Manures — \$50,000

Michael Zeece — USDA Foreign Agricultural Services — Easily Releasable Myofilaments (ERM) in Bovine Skeletal Muscle — \$60,000

John Golbeck and Royce Ballinger — National Science Foundation — The Function Metals in Natural Processes — \$1,046,172

John Golbeck — National Science Foundation — Dynamic Aspects of Photochemical Reaction Centers — \$22,000

Elizabeth Walter-Shea and Timothy J. Arkebauer — NOAA — Radiation and Gas Exchange of Canopy Elements in a Boreal Forest — \$150,000

Michael Meagher — U.S. Army Medical Research and Development Command — Fermentation, Recovery, and Purification of the Hc Fragment of the Botulinum Neurotoxin From *Pichia Pastoris* — \$473,052

Michael Meagher — NASA — Recovery of Fermented Biomass by Cross Flow Filtration — \$213,731

Raul Barletta — NIH — M-avium Drug Targets in the D-alanine Pathway — \$503,212

Martin Dickman — USDA/CSRS — Multi-Institutional Research Coordination Group Proposal: Genetic Basis for Pathogenicity in the Genus *Colletotrichum* — \$50,000

John Golbeck — NIH — Dynamics of Electron Transfer Among Fixed FeS Clusters — \$1,504,884

David Mortensen — USDA/ARS — Characterizing Weed Populations in Nebraska Soybean Fields for More Efficient Management — \$36,900

Leon Higley — EPA — Environmental Costs of Agricultural Pesticides — \$256,408



**GRANTS AND CONTRACTS
RECEIVED
APRIL AND MAY, 1994**

Agricultural Economics	
Helmers, G. A. and Lutgen, L. — Nebraska Wheat Board	12,000
Agronomy	
Baenziger, P. S. — USDA/ARS	50,000
Schepers, J. — Pioneer Hi-Bred International, Inc.	22,500
Miscellaneous Grants Under \$5,000 each	57,075
Animal Science	
Brink, D. — Zinpro Corporation	45,760
Stock, R., Klopfenstein, T. and McCoy, R. — Southeastern Poultry and Egg Assn	39,600
Miscellaneous Grants Under \$5,000 each	10,265
Biochemistry	
Chollet, R. — National Science Foundation	106,000
Golbeck, J. — National Science Foundation	100,000
Ragsdale, S. — National Institutes of Health	157,050
Biological Systems Engineering	
Frantl, T. — DuPont	34,140
Miscellaneous Grants Under \$5,000 each	1,163
Center for Sustainable Agriculture	
Francis, C. — USDA/CSRS	62,311
Entomology	
Stanley-Samuelsen, D. — National Institutes of Health	90,955
Miscellaneous Grants Under \$5,000 each	13,590
Family and Consumer Science	
Prochaska-Cue, K., Davis, E., Combs, E. and Ziebarth, A. — USDA/CSRS	70,807
Food Processing Center	
Miscellaneous Grants Under \$5,000 each	2,734
Food Science and Technology	
Zeece, M. — USDA Foreign Agricultural Service	20,000
Miscellaneous Grants Under \$5,000 each	12,928
Forestry, Fisheries and Wildlife	
Peters, E. — Nebraska Game and Parks Commission	133,500
Peters, E. — Nebraska Dept. of Environmental Quality	75,000
Miscellaneous Grants Under \$5,000 each	500
Horticulture	
Riordan, T. — U.S. Golf Association	63,000
Miscellaneous Grants Under \$5,000 each	23,564
Industrial Ag Products Center	
Hanna, M. — USDA/CSRS	97,242
Miscellaneous Grants Under \$5,000 each	2,244
Northeast Research and Extension Center	
Miscellaneous Grants Under \$5,000 each	39,494
Nutritional Science and Dietetics	
Lewis, N. and Scheidler, S. — North Dakota Ag Products	43,277

Panhandle Research and Extension Center	
Miscellaneous Grants Under \$5,000 each	73,369
Plant Pathology	
Miscellaneous Grants Under \$5,000 each	984
South Central Research and Extension Center	
Miscellaneous Grants Under \$5,000 each	22,500
Veterinary and Biomedical Sciences	
Miscellaneous Grants Under \$5,000 each	2,467
Water Center/Environmental Programs	
Kamble, S. — USDA	13,900
Spalding, R., Alexander, D., and Martin, D. — USDA/CSRS	147,249
Volk, B. — USDA/ARS	200,000
Miscellaneous Grants Under \$5,000 each	8,000
West Central Research and Extension Center	
Nordquist, P. — UN Foundation	13,000
Miscellaneous Grants Under \$5,000 each	16,293
TOTAL	\$1,884,461

NEW OR REVISED PROJECTS

The following station projects were approved recently by the USDA Cooperative State Research Service:

NEB-10-124 (Agricultural Economics) Economic Analysis of Farm Management and Public Policy Alternatives for Improving Groundwater Quality
Investigator(s): R. J. Supalla and J. C. Allen
Status: New Hatch project effective Jan. 1, 1994

NEB-12-235 (Agronomy) Influence of Novel and Alien Genes on the End-Use Quality of Hard Winter Wheat
Investigator: R. A. Graybosch
Status: New State project effective March 1, 1994

NEB-13-096 (Animal Science) Forage Protein Characterization and Utilization for Cattle
Investigator(s): T. J. Klopfenstein and L. E. Moser
Status: Revised Hatch project that contributes to NC-189 effective Oct. 1, 1993

NEB-13-120 (Animal Science) Testicular Modulation of Luteinizing Hormone Secretion
Investigator(s): R. J. Kittok, J. E. Kinder and H. E. Grotjan
Status: New Hatch project effective Jan. 1, 1994

NEB-13-123 (Animal Science) Estrogen-Calcium Relationships During Onset of Metabolic Bone Disease in Laying Hens
Investigator: M. M. Beck
Status: New Animal Health project effective May 1, 1994

NEB-14-078 (Veterinary and Biomedical Sciences) Role of Group A Bovine Rotavirus P Protein Antigenic Epitopes in Immunity and Infection
Investigator: G. E. Duhamel
Status: New Animal Health project effective Jan. 1, 1994

NEB-17-047 (Entomology) Spatial Dynamics of Leafhopper Pests and Their Management on Alfalfa
Investigator: S. D. Danielson

Status: Revised Hatch project that contributes to NC-193 effective Oct. 1, 1993

NEB-21-041 (Plant Pathology) Pathogenic Determinants of Phytopathogenic Fungi

Investigator: M. B. Dickman

Status: Revised Hatch project effective Jan. 1, 1994

NEB-24-031 (Agricultural Leadership, Education and Communication) Impacting Agricultural Literacy of Elementary Students and Teachers Through Teacher Workshops

Investigator: O. S. Gilbertson

Status: New State project effective May 1, 1994

ARD ADVISORY COUNCIL ELECTION RESULTS

As a result of recent elections, the following individuals were selected to serve on the Agricultural Research Division Advisory Council for a three-year period ending June 30, 1997.

District 2: **Charles Shapiro** (*Northeast Research and Extension Center*) — Representing faculty in the Department of Biological Systems Engineering, the Northeast Research and Extension Center, the Southeast Research and Extension Center and South Central Research and Extension Center.

District 5: **Rick Stock** (*Animal Science*) — Representing faculty in the Department of Animal Science.

District 8: **Shirley Niemeyer** (*Textiles, Clothing & Design*) — Representing faculty in the IANR Communications and Computing Services, Agricultural Leadership, Education and Communication, Family and Consumer Sciences, Nutritional Science & Dietetics and Textiles, Clothing & Design.

Returning ARD Advisory Council Members are:

District 1: **Susan Cuppett** (*Food Science and Technology*) — Representing faculty in the Departments of Agricultural Economics and Food Science and Technology.

District 3: **David Mortensen** (*Agronomy*) — Representing faculty in the Department of Agronomy.

District 4: **Ken Hubbard** (*Agricultural Meteorology*) — Representing faculty in the Departments of Agricultural Meteorology, Environmental Programs, Entomology, and Horticulture.

District 6: **Ruben O. Donis** (*Veterinary and Biomedical Sciences*) — Representing faculty in the Departments of Biometry; Forestry, Fisheries and Wildlife; and Veterinary and Biomedical Sciences.

District 7: **Raymond Chollet** (*Biochemistry*) — Representing the faculty in the Departments of Biochemistry and Plant Pathology.

District 9: **David Baltensperger** (*Panhandle Research and Extension Center*) — Representing faculty in the West Central Research and Extension Center and the Panhandle Research and Extension Center.

The Agricultural Research Division appreciates the dedicated service and contributions to the Council by the outgoing members — Julie Albrecht, Dean Eisenhauer, and Chris Calkins.

SMALL BUSINESS AND INNOVATIVE RESEARCH PROGRAM

The Fiscal Year 1995 Solicitation announcement for the Small Business and Innovation Research Program (SBIR) can be accessed from the Cooperative State Research Service "anonymous FTP account". There are five files to be downloaded and an instruction document entitled "readme.txt".

The files can be found via the FTP utility on internet at the following address: darth.esusda.gov.

Please use your e-mail address as the password.

Diane Says

If you want truly to understand something, try to change it.