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# ARD

## Agricultural Research Division News

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December 1997

Volume 32, Number 3

### Season's Greetings

The Agricultural Research Division extends to all faculty and staff our best wishes for a joyful holiday season and a productive new year.

1997 has been a year of challenges and successes. ARD has been highly involved in the UNL reallocation program, post-tenure review of faculty, reorientation of the Nebraska Research Initiative, change in the annual evaluation of administrators, and alteration in the management system at the IANR Dean and Vice Chancellor levels. From a personnel perspective, there were changes in four unit administrators and one interdisciplinary center director during 1997. These positions are now filled by interim heads/director. We are currently recruiting two district directors and an Associate Vice Chancellor. The ARD staff is now at full strength after Darrell Nelson completed his 15-month assignment as Interim Associate Vice Chancellor.

With all of these organizational changes, the productivity of faculty continues to increase. ARD records indicate that during the period FY 1991 to FY 1997, ARD faculty FTE decreased by 13 percent but external grant dollars increased by 49 percent, journal articles and book chapters increased by 10 percent, and theses and dissertations increased by 10 percent. Even with increased expectations for academic citizenship activities and more time devoted to mandated compliance and accountability programs, the ARD faculty have risen to the challenge of meeting clientele needs.

The Agricultural Research Division just finished preparation of the 111th Annual Report. We hope that you will read this report and help celebrate the many accomplishments of you and your colleagues that are documented in the publication. We believe that the annual report documents the overall strength and productivity of ARD in its 111th year. Thanks to each of

you for helping to make our organization among the most respected agricultural experiment stations in the U.S. We look forward to working with you in 1998 to continue these very positive trends.

*Darrell*  
*Mary* *Steve* *Ana*  
*Shirley* *Nelvie*  
*Scott* *Kiane* *Dale*

### CSREES Accountability Report Status

The Agricultural Research Division submitted to CSREES the complete set of Progress Reports (Form AD 421) for each continuing and terminating research project prior to the Dec. 1, 1997 deadline. We appreciate the assistance of all research faculty members in completing their reports and secretarial staff and unit administrators for facilitating submission of the Progress Reports in electronic format.

We also have submitted the Research Work Unit/Project Description — Research Funds and Staff



It is the policy of the University of Nebraska-Lincoln not to discriminate on the basis of gender, age, disability, race, color, religion, marital status, veteran's status, national or ethnic origin or sexual orientation.



Support form (Form AD 419) for each research project prior to the Dec. 1 deadline. This form documents the expenditures and faculty, staff and graduate student FTE assigned to each research project during the previous fiscal year. We thank the unit accounting personnel and unit administrators for ensuring that the AD 419 reports were completed in a timely manner. The diligent efforts of Diane Mohrhoff and Dave Reifschneider in verifying the data and processing the documents are appreciated.

The development of research project outlines and annual submission of Form AD 421 and AD 419 for each project are requirements for a state agricultural experiment station to receive a share of Hatch Act, regional research and animal health funds. These programs provide about \$3.4 million each year to ARD. Most of these funds are used for operating and graduate student stipends in IANR units.

## Federal Research and Development Funding for FY 1998

Listed below are the research and development funds appropriated to various federal agencies by Congress for the FY 1998 budget. It is evident that NIH, NSF and NASA fared well in appropriations. Included in the NSF budget is a new \$40 million plant genome mapping initiative. Unfortunately, the USDA research budget was nearly level from FY 1997 although major efforts were made to obtain budget increases.

One potential bright spot in the USDA funding picture is a \$780 million mandatory spending five year program for applied research and extension contained in the Senate version of the Research, Extension and Education Title of the Farm Bill. It is evident that most federal agencies other than USDA will have larger amounts of grant dollars during this fiscal year. Hopefully, this will provide the incentive for you to prepare proposals for grant programs administered by these agencies.

Agency	FY 1998 Budget*	% change from FY 1997
National Institutes of Health	13.6	+ 7.1
NSF Research	2.6	+ 4.7
NASA R&D	9.8	+ 5.3
DOE R&D	6.3	+ 3.1
DOD R&D	37.9	+ 3.5
USDA Research	1.1	+ 0.6
Interior R&D	0.6	+ 6.1
EPA R& D	0.6	+14.2

\* dollars in billions

## External Grant Support

External grant support is critical to maintain progressive, cutting-edge research in many Agricultural Research Division units. While Agricultural Research Division faculty continue to receive modest state and federal research funding support, this support has not grown proportionately with inflation in recent years and is inadequate for much of the research that needs to be done. ARD faculty have proved in recent years, however, that they are involved in high quality science and can compete successfully for grant funding at state, regional and national levels. The rate of increase in grant funds by ARD units has been excellent in recent years, proving that faculty are writing better proposals as well as learning how better to relate to funding organizations. Many ARD faculty serve on peer review panels for federal competitive grant programs annually. We encourage this practice to enhance faculty members' ability to individually be more competitive in future years, and to be able to mentor peer faculty here at UNL.

We want to encourage ARD faculty to continue to increase their grantsmanship skills in every way possible. The grantsmanship handbook, "Playing to Win," prepared by Dr. David Stanley while he was an ESCOP intern for the Agricultural Research Division, FY 94-95, has been an excellent reference. Faculty not familiar with this are encouraged to contact the ARD office for copies.

The office of the Vice Chancellor for Research recently added a proposal writing staff to assist faculty in proposal preparation. The writers currently are located in Whittier School and can be contacted for details of how to work with them. They are Anne Nation (2-3557), Monica Norby (2-2838), and Marla Rohrke (2-2877). Additional information can be obtained from the office of the Associate Vice Chancellor for Research (2-2851).

While various federal competitive grant programs use different criteria for judging the quality of grant proposals, an article in the May 9, 1997 issue of *Science* magazine described how the National Institutes of Health (NIH) currently are revising peer review procedures. New criteria identify five specific areas that reviewers will use to rate proposals. *Science* says those criteria are:

### "SIGNIFICANCE

Does this study address an important problem? If the aims of the application are achieved, how will scientific knowledge be advanced? What will be the effect of these studies on the concepts or methods that drive this field?

### "APPROACH

Are the conceptual framework, design, methods, and analyses adequately developed, well integrated, and appropriate to the aims of the project? Does the applicant acknowledge potential problem areas and consider alternative tactics?

### "INNOVATION

Does the project employ novel concepts, approaches, or methods? Are the aims original and innovative? Does the project challenge existing paradigms or develop new methodologies or technologies?

### "INVESTIGATOR

Is the investigator appropriately trained and well suited to carry out this work? Is the work proposed appropriate to the experience level of the principal investigator and other researchers (if any)?

### "ENVIRONMENT

Does the scientific environment in which the work will be done contribute to the probability of success? Do the proposed experiments take advantage of unique features of the scientific environment or employ useful collaborative arrangements? Is there evidence of institutional support?"

While various programs use different formats and criteria, it seems that criteria identified by NIH could relate broadly to many of the granting programs ARD faculty are attempting to access. If your grant proposal can answer the questions adequately as identified in the NIH criteria, it would appear to also have a much stronger chance in many of the other competitive grant programs.

## FY 1998 Appropriation for CSREES Research



On Nov. 18, 1997, the president signed the appropriations bill for Agriculture, Rural Development, Food and Drug Administration and Related Agencies. This appropriations bill contains the funding for CSREES research, extension and higher education. The total amount appropriated for cooperative research was \$394,862,000, an amount that is 1.4 percent higher than the previous year. The amounts appropriated by program area are given in the table at right.

Congress provided level funding for base programs but increased the NRI by about \$3 million. A new food safety program was funded at a level of \$2 million and funding for pesticide clearance for minor uses was increased by 57 percent. The rangeland research program was not funded. Several Nebraska state-specific grants were funded again this year.

Program	FY 97 Budget	FY98 Budget
	----- \$ in thousands -----	
<b>Base Programs</b>		
Hatch Act	168,734	168,734
McIntire-Stennis	20,497	20,497
Animal Health	4,775	4,775
Evans-Allen (1890)	27,735	27,734
<b>Subtotal</b>	<b>221,741</b>	<b>221,741</b>
<b>Competitive Grants (NRI)</b>		
Plant Systems	36,044	37,000
Animal Systems	23,104	24,000
Nutrition, Food Qual and Health	7,209	8,000
Natural Resources and Environ	17,194	17,500
Processing and New Products	6,755	6,800
Markets, Trade and Rural Development	3,897	3,900
<b>Subtotal</b>	<b>94,203</b>	<b>97,200</b>
<b>National Special Research Grants</b>		
Food Safety	0	2,000
Pest Control Strategies:		
Critical Issues	200	200
Expert IPM Decision	177	177
Emerging Pest and Disease	1,623	1,623
IPM/Biocontrol	2,731	2,731
Pesticide Clearance	5,711	8,990
Pesticide Impact Assessment	1,327	1,327
Minor Use Animal Drugs	550	550
Nat. Biological Impact Assessment	254	254
Rural Development Centers	423	423
Tropical and Subtropical Ag	2,724	2,724
Water Quality	2,757	2,461
Global Change	1,567	1,000
<b>Subtotal</b>	<b>20,044</b>	<b>24,460</b>
<b>Regional-State Special Research Grants</b>		
Nebraska Special Grants*	1,723	1,723
Other Regional-State Grants	27,991	25,303
<b>Subtotal</b>	<b>29,723</b>	<b>27,035</b>
<b>Other Research Grants</b>		
Rangeland Research Grants	475	0
Aquaculture Centers	4,000	4,000
Alternative Crops	650	650
Sustainable Agriculture	8,000	8,000
Critical Ag Materials	500	550
<b>Subtotal</b>	<b>13,625</b>	<b>13,200</b>
<b>Federal Administration</b>	<b>10,249</b>	<b>11,226</b>
<b>Grand Total</b>	<b>389,585</b>	<b>394,862</b>

\*Includes multi-state projects with Missouri, Iowa State and Georgia.

## Proposals Submitted for Federal Grants

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The following is a listing of proposals that were submitted after September 1997 by faculty for federal grant programs. While not all grants will be funded, we are appreciative of the faculty member's effort in submitting proposals to the various agencies.

**Kulvinder Gill and K. Arumuganathan** — National Science Foundation, EPSCOR — Generating Chromosome Arm-Specific BAC (bacterial artificial chromosome) Library of Wheat Using Flow Cytometry — \$450,808

**John A. Schmitz and Donald W. Helmuth** — National Institutes of Health — Expanding and Improving Laboratory Animal Resources — \$389,250

**Bob Volk** — USDA/ARS — Integrated Nitrogen, Water, and Pesticide Management Systems to Protect Ground Water Quality — \$100,000

**Kulvinder Gill** — National Institutes of Health — Mechanism of Chromosome Pairing and Homology Search — \$500,341

**John Schmitz** — USDA/ARS — Development of Diagnostics and Control Strategies for Mucosal Infectious Agents in Vivo — \$25,000

**Michael Meagher** — U.S. Army — Fermentation, Recovery and Purification of Hc Fragment for the Botulinum Neurotoxin from *Pichia pastoris* — \$2,071,683

**John Lindquist and Timothy J. Arkebauer** — USDA/NRI — Quantifying Nitrogen Uptake and Biomass Partitioning for Predicting Corn-Velvetleaf Competition — \$204,937

**Nancy Norton and Brian Benham** — USDA/NRI — Environmental and Economic Effects of Reducing Irrigation Water and Nitrogen Use — \$409,870

**Tony L. Buhr** — USDA/NRI — Generating an *Arabidopsis* Population with Over-Expressed and Inactivated Genes — \$90,000

**Nancy M. Betts** — USDA/NRI — Using Behavioral Models to Promote Grain, Vegetable and Fruit Consumption by Young Adults — \$920,427



## Grants and Contracts Received October and November, 1997

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<b>Agricultural Meteorology</b>	
Hubbard, Kenneth — Cornell University	\$ 12,100
<b>Agronomy</b>	
Andrews, Dave — USDA/Intsormil	44,400
Baltensperger, David and Nelson, Lenis — Pioneer Hi-Bred Int'l	19,210
Maranville, Jerry — USDA/Intsormil	24,605
Mason, Steve — USDA/Intsormil	25,160
Mortensen, David — USDA/CSREES	35,100
Miscellaneous grants under \$10,000 each	17,700
<b>Animal Science</b>	
Grotjan, Ed — USDA/CSREES	150,000
Milton, Todd — Elanco Animal Health	25,000
Milton, Todd — Performance Products	11,440
Milton, Todd — Cargill Corn Milling	29,375
Morrison, Mark — USDA/CSREES	142,660
Miscellaneous grants under \$10,000 each	31,169
<b>Biochemistry</b>	
Allison, Lori — USDA/CSREES	130,000
Spreitzer, Robert — USDA/CSREES	110,000
<b>Biological Systems Engineering</b>	
Watts, Darrell — USDA/CSREES	70,749
<b>Dean's Office</b>	
Waller, Steve — USDA/CSREES	1,795,300
<b>Entomology</b>	
Foster, John — USDA/ARS	33,000
Siegfried, Blair — Mycogen Seeds	15,000
Miscellaneous grants under \$10,000 each	49,700
<b>Food Science and Technology</b>	
Bullerman, Lloyd — USDA/CSREES	97,000
Wehling, Randy — USDA/CSREES	59,627
Miscellaneous grants under \$10,000 each	12,500
<b>Horticulture</b>	
Gaussoin, Roch — U.S. Golf Association	20,000
Johnson, Paul — The Scotts Company	13,500
Miscellaneous grants under \$10,000 each	19,300
<b>Northeast Research and Extension Center</b>	
Miscellaneous grants under \$10,000 each	4,500
<b>Panhandle Research and Extension Center</b>	
Miscellaneous grants under \$10,000 each	33,875

<b>Plant Pathology</b>	
Miscellaneous grants under \$10,000 each	2,913
<b>School of Natural Resource Sciences</b>	
Miscellaneous grants under \$10,000 each	500
<b>South Central Research and Extension Center</b>	
Miscellaneous grants under \$10,000 each	14,100
<b>Veterinary and Biomedical Sciences</b>	
Donis, Ruben and Rogers, Douglas — National Pork Producers	18,000
Jones, Clinton — Pfizer	117,850
Jones, Clinton — USDA/CSREES	248,452
Osorio, Fernando, Wills, Robert and Doster, Alan — National Pork Producers	17,650
Schmitz, John — USDA/ARS	25,000
Wills, Robert, Osorio, Fernando and Doster, Alan — National Pork Producers	16,965
Miscellaneous grants under \$10,000 each	5,075
<b>Water Center</b>	
Volk, Bob — USDA/ARS	100,000
<b>West Central Research and Extension Center</b>	
Wicks, Gail — Washington State University	20,000
Miscellaneous grants under \$10,000 each	5,500
<b>Grand Total</b>	<b>3,623,975</b>

## New or Revised Projects

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The following station projects were approved recently by the USDA Current Research Information System:

**NEB-12-227 (Agronomy) Perennial Forage Grass Breeding for Nebraska**

*Investigator:* Ken Vogel

*Status:* Revised State project effective Oct. 1, 1997

**NEB-13-136 (Animal Science) Synthesis and Assembly of Cellulose Binding Proteins by *Ruminococcus albus***

*Investigator:* Mark Morrison

*Status:* New Special Grant effective Sept. 15, 1997

**NEB-16-077 (Food Science and Technology) Genetics and Biochemistry of Stress-Response Systems in Gram-Positive Bacteria and Foodborne Pathogens**

*Investigator:* Andy Benson

*Status:* New Hatch project effective Oct. 1, 1997

**NEB-20-059 (Horticulture) Factors Affecting Prairie Forb and Grass Establishment: Interference in Sustainable Landscape Planting**

*Investigator:* Gregory Davis

*Status:* New Hatch project effective Oct. 7, 1997

**NEB-21-069 (Plant Pathology) Leaf Rust Virulence in Nebraska and Management Systems for Turfgrass Diseases**

*Investigator:* John Watkins

*Status:* New Hatch project effective Oct. 1, 1997

**NEB-44-016 (Panhandle Research and Extension Center) Weed Control Systems for Western Nebraska Irrigated Crops and Rangeland**

*Investigator:* Robert Wilson

*Status:* Revised Hatch project effective Oct. 1, 1997

**NEB-44-052 (Panhandle Research and Extension Center) The Economics of Alternative Beef Cattle Marketing and Feeding Strategies**

*Investigator:* Dillon Feuz

*Status:* New Hatch project effective Nov. 1, 1997

**NEB-91-049 (Nutritional Science and Dietetics) Nutrition Knowledge, Practices, Beliefs of Caregivers and Practices of Physicians for Young Children**

*Investigator:* Kaye Stanek

*Status:* New Hatch project effective Sept. 5, 1997

## Free Publication on Highlights of NAPIAP

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A recently completed publication, *Pesticides and the Bottom Line*, features the accomplishments and contributions made by the North Central Region land-grant institutions' National Agricultural Pesticide Impact Assessment Program (NAPIAP). NAPIAP is supported through U. S. Department of Agriculture's Cooperative State Research, Education and Extension Service (USDA/CSREES). NAPIAP provides information on assessment of the bottom line impacts from pesticides that are critical to crop and livestock production.

NAPIAP information plays a major role in addressing risk and benefit issues raised by the Environmental Protection Agency (EPA). The essential data required in assessing risks/benefits of pesticides include the amount of pest control product applied, percent of crop treated, treatment methods, target pests, non-chemical pest control methods and general crop management practices. Through these contributions, NAPIAP activities and programs assume great importance not only to regulatory decision makers, but to agricultural producers and consumers. For free copy and further information, please contact Dr. Shripat T. Kamble, State NAPIAP Liaison at (402) 472-6857.

## Superfund Cleanup Progress at the ARDC

The Superfund cleanup of contaminated soil, water and buildings at the ARDC is progressing. The soil cleanup should come to an end in late December or early January. Over 13,000 cubic yards of soil will be incinerated. Some of the incinerated soil will be moved to the Turf and Ornamental Area for use in nutrient depletion studies. We are receiving proposals for the use of the incinerator site until Dec. 15, 1997.

Construction will begin in December on a pipeline from the COE well in the Forestry Area to a water treatment plant that will be constructed on the Air Force Reserve Property south of the Soil and Crops Area. This pipeline will run along the north side of Highway 63 just inside our property line. This well, in combination with a well on the property of Stan Kaiser, is intended to halt the spread of the contamination plume until the actual cleanup can begin. The cleanup phase of the groundwater remediation will last somewhere between 45 and 130 years and will involve the treatment of 3,000 to 8,000 gallons of water per minute.

Asbestos remediation has begun on Load Line #2. The contractors hope to be finished with the asbestos remediation of all four load lines, the igloos and the office building in the Soils and Crops Area by the late summer of 1998. Actual building demolition is scheduled to begin in April of 1998 and is scheduled to go for 18 months.

The ARDC is a very busy place, especially at certain times of the year. The COE activity will add hundreds of contractors, regulators and COE personnel on top of our activity. Please drive safely and slowly on the ARDC at all times and especially during the next two years. Watch for trucks and other heavy equipment. Please emphasize to everyone the increased need to be aware of activity around you and to operate in as safe a manner as possible.

### Diane says

Opportunity does not batter a door off its hinges when it knocks.

## World Rankings of Scientific Papers

The July 7 issue of *The Scientist* reported that European Union (EU) scientists now publish about the same number of peer-reviewed papers as U.S. scientists, according to a survey conducted by *Science Watch*. During the past 16 years, the EU's share of research papers increased from 30.5 percent to 36.2 percent whereas the U.S. share fell from 40.5 percent to 36.5 percent. Also contributing to the decline in U.S. share is a significant increase in research paper output from Asian and Latin American scientists. From 1981 to 1997, Asian/Pacific and Latin American shares of total paper output increased from 12.8 to 18.8 percent and 1.3 to 2.3 percent, respectively.

During the past five years, EU scientists had the highest concentration of papers in the medical fields of rheumatology, gastroenterology, dermatology, endocrinology, hematology, and urology. The nations of the Asia Pacific region concentrated most heavily in agricultural chemistry, metallurgy, agriculture/agronomy, materials science, and applied physics/condensed matter. Latin America produced its highest proportions of papers in the fields of general biology, agriculture/agronomy, and space science.

Switzerland topped the list of nations ranked by citations per paper during the period 1992-1996 (see table below). The U.S. was second in the ranking, followed by the Netherlands, Sweden, Denmark and the United Kingdom. In examining the impacts of papers published in specific fields by comparing the average citations per paper against the world average in each field, the EU nations scored highest in geological/petroleum/mining engineering, agriculture/agronomy, nuclear engineering and entomology/pest control.

Nation	Citations per paper	Number of papers
Switzerland	5.66	55,000
United States	5.03	1,239,000
Netherlands	4.45	80,000
Sweden	4.38	61,000
Denmark	4.38	31,000
United Kingdom	4.19	301,000
Belgium	3.94	38,000
Finland	3.93	27,000
Canada	3.83	167,000
Germany	3.78	259,000
France	3.66	198,000