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## ARD News June 1998

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# ARD

## Agricultural Research Division News

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June 1998

Volume 32, Number 6

### Comments from the Dean

Dear Colleagues:

In recent weeks, two helpful developments have occurred that will affect ARD research programs. First, the Nebraska Legislature appropriated \$250,000 per year for the two years of the current biennium and indicated its intent to provide an additional \$250,000 per year for an additional three years for food safety research dealing with *E. coli* 0157:H7. The focus of the research is on preharvest practices that will minimize occurrence of the pathogen in beef cattle. The intent is to reduce the level of *E. coli* 0157:H7 prevalence in cattle entering packing plants. A faculty committee has developed an integrated research program that has been presented to the initiatives' Executive Committee for their comments and ultimate approval.

The U.S. Senate has approved the Conference Committee version of the Research, Education and Extension Title for the 1996 Farm Bill (S.1150). The bill is under consideration by the House of Representatives. This authorization bill provides a new competitive research and education program that is funded at a level of \$125 million per year for five years directed primarily at applied research and outreach. Program elements of the new initiative are likely to include food safety, human nutrition, agricultural biotechnology, natural resources management, and the agricultural genome mapping. The bill also extends the Fund for Rural America program for an additional three years. Both of these programs received funds from the mandatory portion of the USDA budget and do not require an annual appropriation.

We are excited about these new opportunities for funding your research programs and encourage you to be highly proactive in developing quality proposals for the competitive programs. Important steps to increase your possibility of success with competitive grant

proposals are: careful review of the RFP and drafting the proposal to address listed priorities, peer review of the proposal to ensure that the science is well described and logically presented, and professional assistance in writing the final draft. Grant writing assistance is provided by the Office of the Vice Chancellor for Research in the Whittier Building. Best wishes for success with your proposals.

Darrell W. Nelson  
Dean and Director

### Graduate Research Assistantships Paid from USDA Funds

Federal law prevents UNL from charging tuition remission costs for graduate students whose graduate research assistantship (GRA) stipends are paid from USDA funds. This applies to GRAs paid from USDA-ARS Research Support Agreements, USDA Cooperative Agreements, National Research Initiative funds, or funds provided through CSREES Special Research Grants. Effective May 1, 1998, all tuition remission costs charged to any/all company centers funded by USDA will be disallowed.

UNL administrators have agreed that IANR can deviate from UNL policy that requires charging tuition remission to the company center that pays the GRA stipend. However, units must designate another source of funding for the tuition remission costs. Units will establish a special company center to pay tuition remission costs for USDA-funded graduate students and transfer non-USDA derived funds into this company center to cover the annual costs. Please keep in mind that tuition remission costs are currently about 20 percent of stipend per year for each graduate student holding a GRA. Thus, units must plan ahead to have this level of funding available for tuition remission charges.



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.



## **CSREES Leadership Change**

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Dr. Robert Robinson, CSREES Administrator, has been reassigned to other duties in the Office of the Undersecretary of Research, Education and Economics. Dr. Colien Hefferan has been appointed as the Acting Administrator. Her permanent position is CSREES Associate Administrator. Dr. Miley Gonzalez, Undersecretary for Research, Education and Economics, is seeking candidates for the Administrator position from among land grant universities. Since CSREES is primarily focused on coordinating and supporting programs carried out by land grant universities, it is important that an Administrator be appointed who has excellent knowledge of the LGU System. If you have any suggestions for nominees, please forward the names and affiliations to Darrell Nelson in the ARD Office.

## **"Pioneering the Future" Database**

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For more than two years, ARD has been developing and testing an accountability database for our portfolio of research projects. The Departments of Entomology and Horticulture cooperated in the test phase by providing information about their research projects for entry in the database. As a result of the test, the ARD Advisory Council has recommended that the "Pioneering the Future" database be fully implemented to include our entire research project portfolio. This will require that each faculty member with a research project provide some specific information about their project such as brief project description, goals/objectives, results to date, potential implications of the research, and region(s) of the state affected by the research. This data will be remotely entered by faculty members through the WWW. The ARD Office will set up the data entry screens for each project and enter some of the data available to us. We anticipate that faculty members will complete their part of data entry in October 1998. As new projects are developed or projects revised, the principal investigator will be asked to add the project information to the database.

We continue to receive questions about our use of taxes provided to the University of Nebraska for IANR research. This database will provide information to decision makers, citizens and UNL faculty and staff concerning ongoing projects, potential impacts, and some indication of the return on taxpayer investment in our programs. We hope to have this program on the WWW and, thus, available to any person wishing to have information about our research efforts. Interested persons will be able to search the database by research topic, unit, and region of the state affected by the research. We believe the "Pioneering the Future" database will have a positive impact on our image throughout Nebraska and the U.S.

## **Fund for Rural America Update**

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Awards have been made for the first round of the "Fund for Rural America" competition. IANR faculty have had modest success with their proposals. Bahman Eghball (Agronomy Department) received funding for a manure management project. Brian Benham (SCREC), Tom Franti (Biological Systems Engineering Department) and other IANR faculty are partners with Kansas State University personnel on a project studying water quality in the Blue River Basin. Sam Cordes and John Allen (Agricultural Economics) are participants in a FRA center grant dealing with rural development and policy analysis obtained by the Rural Policy Research Institute, Southern Region Rural Development Center and the National Association of Counties.

CSREES will have at least \$33 million in new funds for FRA on Oct. 1, 1998. About \$11 million of this will be used to fund the center grants awarded during the first round of competition. The remaining \$22 million plus any funds provided from the Secretary's discretionary \$33 million will be used to fund "standard" grants in the second round of competition. The RFP for the next round of competition should be issued in the near future. CSREES intends to evaluate proposals and award grants before Jan. 1, 1999.

We anticipate that the same guidelines will apply for the second round of competition as used in the original RFP. This means that proposals should be multifunctional (involve at least two functions of research, extension and teaching), multidisciplinary, and address one of the priority areas listed in the RFP. Multistate proposals are encouraged and will have preference in the selection process. We suggest that previously submitted proposals be revised in light of reviewer comments and resubmitted. New proposals are also highly encouraged. Please draft your proposals well ahead of the deadline so that the grant writers employed by the Office of the Vice Chancellor for Research can help you write the proposal in best possible manner. Diane Mohrhoff in the ARD Office can assist you with budget development and assurance statements.

## **Nominations Sought for Junior Faculty Excellence in Research Award**

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The Agricultural Research Division is seeking nominations for the Junior Faculty Excellence in Research Award. Given to 11 individuals since 1991, the award is designed to acknowledge outstanding research activity by tenure-track ARD faculty with five years or less of service.

Any ARD faculty member or unit administrator can nominate a deserving junior faculty member. Selection criteria include publications of UNL-based research results, external funding and peer recognition. Award winners will receive a \$3,000 grant for professional development or research expenses along with a plaque and certificate.

The deadline for submission of nominations is Aug. 14, 1998. Additional information can be obtained from unit administrators or by contacting Dora Dill at 472-7082.



## Grants and Contracts Received April and May, 1998

<b>Agricultural Economics</b>	
Miscellaneous grants under \$10,000 each	3,000
<b>Agronomy</b>	
Bahman Eghball, James Schepers, Glenn Helmers, Gary Hergert and Merle Vigil — USDA/CSREES	220,000
Miscellaneous grants under \$10,000 each	102,270
<b>Animal Science</b>	
Miscellaneous grants under \$10,000 each	39,914
<b>Biochemistry</b>	
Donald Weeks — NSF	85,000
<b>Biological Systems Engineering</b>	
Leonard Bashford and Michael Kocher — Trelleborg, Inc.	36,913
William E. Splinter — UN Foundation	46,000
Miscellaneous grants under \$10,000 each	7,500
<b>Center for Rural Revitalization</b>	
John Allen — University of Missouri — Columbia	82,113
<b>Center for Sustainable Agriculture</b>	
Charles Francis, Terry Klopfenstein and James Brandle — USDA/CSREES	55,152
<b>Entomology</b>	
Miscellaneous grants under \$10,000 each	27,150
<b>Food Science and Technology</b>	
Susan Hefle — USDA/CSREES	140,216
Michael Meagher — Private Sponsor	237,528
Steve Taylor — USDA/CSREES	39,260
Miscellaneous grants under \$10,000 each	7,200
<b>Horticulture</b>	
Terry Riordan and Paul Johnson — US Golf Association	125,000
Miscellaneous grants under \$10,000 each	13,869
<b>Industrial Agricultural Products Center</b>	
Milford A. Hanna — USDA/CSREES	59,825
<b>Northeast Research and Extension Center</b>	
Miscellaneous grants under \$10,000 each	11,300
<b>Panhandle Research and Extension Center</b>	
Drew Lyon — Anna Elliott Fund via NU Foundation	14,000
Miscellaneous grants under \$10,000 each	90,275

<b>Plant Pathology</b>	
Tom Powers — Nebraska Game and Parks	60,000
John Watkins — NGCSA and GCSA	12,000
Miscellaneous grants under \$10,000 each	5,600
<b>School of Natural Resource Sciences</b>	
Mary Exener/Dan Snow — National Water Research Inst.	24,304
Ed Peters — US Fish and Wildlife	91,610
Roy Spalding — Nebr. Dept. of Agriculture	27,000
Bob Volk — Nebr. Dept. of Environmental Quality	190,000
Bob Volk — DOI-GS	20,000
Elizabeth Walter-Shea — National Center Atmospheric Research	82,070
Elizabeth Walter-Shea — NASA	185,000
Miscellaneous grants under \$10,000 each	1,075
<b>South Central Research and Extension Center</b>	
Miscellaneous grants under \$10,000 each	9,940
<b>Veterinary and Biomedical Sciences</b>	
Jeff Cirillo — Indoor Air Research Inc.	124,938
Ruben Donis — The State University of New York	74,364
John A. Schmitz — NU Foundation	55,000
Miscellaneous grants under \$10,000 each	27,033
<b>West Central Research and Extension Center</b>	
Miscellaneous grants under \$10,000 each	19,379
<b>Grand Total</b>	<b>2,452,798</b>

## New and Revised Projects

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

### NEB-12-204 (Agronomy) Biological and Ecological Basis for Weed Management Decision Support Systems to Reduce Herbicide Use

*Investigator(s):* David A. Mortensen and John L. Lindquist

*Status:* Revised Hatch project effective Oct. 1, 1995

### NEB-13-140 (Animal Science) Role of Adipose Tissue in Determining Energy Utilization in Cattle

*Investigator:* Jess L. Miner

*Status:* New Hatch project effective March 3, 1998

### NEB-44-053 (Panhandle Research and Extension Center) Machinery Systems Management for Sugarbeets, Dry Edible Beans, and Chicory

*Investigator(s):* John A. Smith and Robert G. Wilson

*Status:* New Hatch project effective Feb. 4, 1998

### NEB-44-054 (Panhandle Research and Extension Center) Plant Germplasm and Information Management and Utilization

*Investigator(s):* David D. Baltensperger and Kenneth P. Vogel

*Status:* New Hatch project that contributes to regional project NC-7 effective Oct. 1, 1997

## Proposals Submitted for Federal Grants

The following is a list of proposals that were submitted after April 1998 by faculty for federal grant programs. While not all grants will be funded, we appreciate faculty members' effort in submitting proposals to the various agencies.

**K. Arumuganathan** — NSF — Three-way Mapping of Maize Chromosome Number 9 — \$298,563

**Martin B. Dickman** — NSF — Plant Genome Research Program — \$1,587,389

**P. Stephen Baenziger, K. Arumuganathan, Thomas Clemente, Kulvinder Gill, Dermot Coyne and James Steadman** — NSF — The Structure, Function and Evolutionary History of Crop Disease Resistance Genes — \$1,875,000

**Lance Meinke** — USDA/ARS — Western Corn Rootworm Resistance to Insecticides Development of Resistance Management Strategies — \$60,000

**Ruma Banerjee** — NIH — Isotope Effects on Aspartate Transcarbamylase — \$20,020

## Campus Master Planning Activity

All components of the University of Nebraska system have a mandate to complete a master campus plan by late 1998. The University of Nebraska-Lincoln master planning effort has been going on since late 1997. The planning effort is under the leadership of John Benson, Director of Institutional Research and Planning and campus planner for UNL. The early planning activities have involved input from IANR facilities office as well as from IANR administrators, and from facilities personnel and administrators from other sectors of UNL.

A campus master plan includes a broad scope of planning areas. It includes a thorough inventory of all space by use category and condition. There are comparisons with similar universities with similar missions. There are projections of space needs and adequacy based on size of programs and anticipated program changes. Deferred maintenance needs are identified and projected for campus facilities. The plan includes a six-year capital construction plan with priorities. Over the past several months, both Lincoln based units, as well as R & E Centers, have been providing feedback to the planning effort on the current space data.

Other aspects of the planning process are campus vehicle traffic flow, campus parking, campus appearance and aesthetics, pedestrian and bicycle traffic patterns, campus signage and campus entrances and

visitor reception. In several of the latter categories, it is recognized that UNL Lincoln campuses have not done as well as desired.

The planning operation has recently entered a new phase, involving professional planning consultants from two Denver firms, Paulien and Associates Inc. and EDAW, as well as representatives from a local architecture firm, Bahr, Vermeer and Haecker. The consultants have been working on campus for several weeks meeting with campus planners and working with other groups such as Faculty Senate, Academic Planning Committee and various administrators. Research and Extension Centers and the Agricultural Research and Development Center also are participating in this process and a planning format has been provided to them to allow individual planning efforts to proceed at each of these locations. These will form a part of the total UNL plan when completed.

Another significant issue being addressed in the planning process as well as independently is the Antelope Valley Study currently underway in conjunction with the City of Lincoln, Lower-Platte South NRD, Corps of Engineers and others. Also included in the planning effort are needed improvements to halt stream bank erosion and general deterioration in the area of Dead Man's Run and its tributaries on East Campus.

Drafts of the plans resulting from this effort will be available for comment and review in late Summer of 1998. Any questions in the interim can be addressed to Dale Vanderholm or to Karen Van Horn, IANR Facilities Coordinator.

## National Research Initiative Program — FY 1997

The 2,840 proposals considered by the NRI in 1997 requested funds totaling \$591.5 million. Funding was available for 712 grants totaling \$87.3 million which includes five awards totaling \$1 million for Water Resources and Protection proposals submitted in FY 1996. The success rate for proposals was 24 percent, which was the same level as in FY 1995 and 1996. The average grant award for regular research grants was \$133,400, up from \$125,600 in FY 1996 with an average duration of 2.6 years up from 2.1 years in FY 1996.

Analysis of funded proposals indicate that 52 percent were fundamental research and 48 percent were mission-linked research. Multidisciplinary research was a feature of 27 percent of funded projects whereas 73 percent of awards were for single-discipline research. In addition to the awards described above, the NRI also funded about \$15.9 million in Agricultural Research Enhancement Awards (postdoctoral fellowships, new investigator awards, and strengthening grants) during FY 1997. Partial support for 26

conferences totaling \$175,500 was also provided by the NRI in FY 1997.

Listed below are the number of awards and total funding provided by program areas in FY 1997:

Research Area	No. of Grants	Total \$ Awarded
Natural Resources and Environment	69	12,030,849
Nutrition, Food Safety and Health	49	6,059,731
Animal Systems	123	20,025,169
Pest Biology and Management	120	13,078,777
Plant Systems	158	18,658,584
Markets, Trade and Rural Development	31	3,289,000
Enhancing Value and Use of Agric. Products	61	7,677,157
Other*	101	6,494,466

\* Agricultural Systems; Strengthening Programs; Collaborative Plant Biology Program; Terrestrial Ecology and Global Change; Arabidopsis Genome Sequencing.

## Agricultural Productivity in the U.S.\*

Increased productivity is a key to a healthy and thriving economy. Therefore, productivity trends are closely observed as economic performance indicators. Agriculture has been a very successful sector of the U.S. economy in terms of productivity growth — increasing outputs while using inputs efficiently. Productivity captures the growth in outputs not accounted for by the growth in inputs. It is commonly expressed as total factor productivity (TFP), which is the ratio of total outputs to total inputs. If the ratio is increasing, then the ratio can be interpreted to mean that more outputs can be obtained for any given level of inputs. The normal approach to measure agricultural TFP is to include only those outputs and inputs that are under the control of the farmer and for which a market exists.

Total U.S. agricultural output grew at an annual average rate of 1.88 percent between 1948 and 1994. Output growth can be attributed to growth in conventional inputs and growth in productivity. Real expenditures on agricultural inputs declined by 0.06 percent during this period. Thus, the output growth during this period was the result of the 1.94 percent annual average increase in productivity. TFP has varied over time during this period as indicated in the table below:

Period	Total Outputs	Total Inputs	TFP
----- Average Annual Growth Rate, % -----			
1948-60	1.72	0.61	1.12
1960-70	1.45	-0.46	1.91
1970-80	2.26	1.02	1.22
1980-90	1.68	-1.68	3.36
1990-94	2.96	0.18	2.77

Agriculture's productivity performance, compared to all other industries in the U.S. economy, is noteworthy. Agriculture has one of highest rates of productivity

growth in the economy. However, because production agriculture is a relatively small industry, accounting for less than 1.5 percent of the gross domestic product of businesses in the U.S. economy, its productivity rate has little effect on the productivity of the overall economy.

\* Taken from *Agricultural Productivity in the United States*, Economic Research Service Bulletin Number 740, U.S. Department of Agriculture, Washington, D.C. 20036-5831.

## ARD Interdisciplinary Research Grants Program

Twenty-two proposals were submitted to the ARD Interdisciplinary Research Grants Program and six proposals were selected to be funded for 1998-99. One continuation project was also funded. New ARD Interdisciplinary Research Grants were awarded to the following:

**Jung Blumenthal, Dillion Feuz, Eric Kerr (Agronomy, Agricultural Economics, Plant Pathology)**

Taking Advantage of Winter Wheat Protein Premium Through Late-Season Nitrogen Fertilization

**Don Adams, Todd Milton, Terry Klopfenstein, Dick Clark, Jerry Volesky**  
Cow-Calf Yearling Beef Production Systems

**Terry Riordan, Paul Johnson, Thomas Clemente, S. Fei, Bob Klucas (Horticulture, Center for Biotechnology)**  
Development of Glyphosate Resistant Buffalograss

**Dennis Schulte, Shashi Verma, David Billebach, Richard Koelsch (Biological Systems Engineering, SNRS, Electrical Engineering)**  
Characterization and Modeling of Odor Emissions from Animal Production Facilities

**Mike Zeece, John Markwell, Gautam Sarath, Dwane Wylie (FS&T, Biochemistry, Biological Sciences)**  
Mapping and Site Directed Multigensis of IgE-binding Epitopes in a Food Allergen from Soybean (Gly m Bd 30k)

**Walt Stroup, Ellen Pappozzi (Biometry)**  
Innovative Design and Analysis of Agricultural Experiments to Characterize Response to Several Quantitative Treatment Factors

The following continuing projects have been evaluated and will continue for 1996-97:

**Shripat Kamble (Water Center/Environmental Programs)**  
Development of a Biochemical Approach to Manage German Cockroaches.

# Supporting ARD Researchers – IANR Land and Physical Facilities

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ARD researchers as part of the Institute of Agriculture and Natural Resources use a wide range of physical facilities and land throughout the state. The land and physical facilities are extensive in quantity and location and diverse in building type and use. The physical facilities are generally concentrated on the Lincoln campus, although several extended campus locations also have significant physical facilities. Land holdings also are distributed across the state in various climate and soil types, reflecting agriculture of the area. Following is a brief summary of the IANR facilities that support ARD research.

## I. East Campus

- A. **Land:** Total acreage of UNL's East Campus is about 340 acres; the IANR share of this total cannot be precisely defined, although estimates indicate that the IANR portion of this may be as much as 80 percent. Research plots may account for as much as 25 percent of the total acreage, or approximately 80 acres.
- B. **Physical facilities:** There are 66 buildings assigned primarily to various IANR departments on East Campus. These 66 buildings total slightly more than 1.2 million square feet (approximately 28 acres), an area roughly equal to the total retail area of Lincoln's Gateway Mall. This total includes extensive research and teaching laboratories as well as over 127,500 square feet of greenhouse space. The remainder is primarily office space, classrooms, and related support and storage spaces. Additionally, there are many non-IANR facilities that indirectly support IANR activities, such as the East Campus Union, C. Y. Thompson Library, the central heating plant, service building, the dormitories, and other miscellaneous structures that indirectly serve IANR.

## II. City Campus

- A. The Department of Biochemistry program activities occupy the Beadle Center on the City Campus, as do other IANR, related activities such as the Biotechnology Center and others.

## III. ARDC, Ithaca

- A. Total acreage of the Agricultural Research and Development Center, Mead/Ithaca area is approximately 9,500 acres or nearly 15 square miles. It is the second largest single land holding in the University of Nebraska system. A great variety of agricultural research plots account for the greatest land usage.
- B. **Facilities:** There are a total of 106 buildings at ARDC, including the recently constructed headquarters building. The majority of the

buildings are generally of a farm-support type function, such as machine storage, hay and grain storage, livestock housing, and a variety of other miscellaneous farm-type uses.

Consequently, the square footage does not provide a meaningful comparison with the East Campus. Total area of all buildings and storage equals 562,700 square feet. This total does not include many unused military structures of WWII vintage that are identified for demolition in the current U. S. Army Corp of Engineers project that is underway.

## IV. Research and Extension Centers

The Southeast Research and Extension Center headquarters is located on East Campus in Mussehl Hall. The other four R & E Centers are the Northeast at Norfolk, South Central near Clay Center, West Central at North Platte and Panhandle at Scottsbluff. These Centers have extensive land and physical facilities to support the programs in the districts where located.

- A. **Land:** The four extended campus R & E Centers operate approximately 3,240 acres of research land near the headquarters areas, primarily devoted to crop research.
- B. **Facilities:** The R & E Centers occupy nearly 150 buildings including headquarters buildings that house offices, distance learning facilities, research laboratories, diagnostic facilities and many other research and research support functions.

- V. **Farms, Labs and Other Facilities:** The IANR also operates numerous research farms, agricultural labs, and related facilities throughout the state. Several of these are associated with R & E Centers and are at 14 locations, comprising 25,752 acres of land and 49 buildings. The largest single land holding in the NU system is the IANR Gudmundsen Sandhills Lab, near Whitman. It is a Sandhills cattle ranch research and education facility, consisting of 12,817 acres and 16 buildings.

As identified above, the land and physical facilities that support ARD research and other programs are significant. Excluding East Campus facilities in Lincoln, IANR programs use approximately 220 buildings at extended campus locations and operate over 38,000 acres of land. Maintenance, infrastructure, utilities, and other operating costs are a significant part of the annual budget requirements for conducting UNL programs statewide.

## Diane says

Don't use a gallon of words to express a spoonful of thought.