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ARD

Agricultural Research Division News

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August 2002

Volume 35, Number 6

Comments from the Dean

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Dear Colleagues:

As this is being written, the Nebraska Legislature is meeting in special session to further reduce the state budget for the current fiscal year. It is likely that the University of Nebraska System will sustain another budget cut as an outcome from Unicameral decisions. IANR administrators are well aware that the uncertainty associated with the budget situation is resulting in much stress among faculty and staff. We are hopeful that the special session will end soon so that budget decisions can be made in a timely manner, thereby eliminating some of the ambiguity confronting IANR employees.

Budget reduction decisions within IANR will be based on preserving core programs that address essential state needs and on the quality of existing programs. In other words, we are proposing to maintain mission-critical and high-productivity programs. Whatever the size of the budget challenge facing IANR, we want to ensure that excellence is maintained in high priority programs that are critical for Nebraska's future.

We all can become depressed by Nebraska's current economic climate and funding for higher education. However, there are two mitigating circumstances that must be considered. First, many entities within and external to Nebraska are experiencing tremendous economic problems. Many farmers and ranchers in Nebraska and neighboring states are in financial difficulty due to the historic low commodity prices and the current drought. Likewise, higher education in many states, including Iowa and Missouri, is experiencing actual reductions in state funding coupled with increasing costs of medical insurance, utilities, and liability insurance.

Second, our faculty are increasingly successful in obtaining external funds to support their research programs. During FY 2001, ARD faculty obtained \$25.2 million in grants and contracts, including \$16.6 million from federal agencies. This represents more than 40 percent of all research grants and contracts obtained by UNL faculty during the fiscal year. Likewise, grant and contract expenditures during FY 2001 were the highest on record at \$158,100 per research FTE. When expenditures associated with the Nebraska Research Initiative and product sales are included, the total non-appropriated expenditures for FY 2001 exceeded \$250,000 per research FTE. Interestingly, appropriated funds represented only 48 percent of the total research expenditures. This clearly indicates that we can no longer count on increases in state-appropriated or federal-formula funds to address increased financial needs. Rather the focus must be on grants and contracts as the means to enhance programs. Every faculty member with an ARD appointment must be proactive in seeking external funds. The UNL Office of Research has programs to assist faculty members in upgrading their grant-writing skills. Please contact the Office of Research if you need assistance.

*Darrell W. Nelson
Dean and Director*

ARD Unit Resources and Performance Indicators for FY 2001

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We are pleased to report that during FY 2001 the average resources provided to units and outputs from units continue to exceed the performance goals established by the ARD Advisory Council several years ago. The ARD goals and the unit averages for FY 2001 are:



Indicator	ARD Average	ARD Goal	% of Goal	Number of Units Exceeding Goal
Appropriated \$/FTE	200,587	150,000	134	14
Grant/Contract \$/FTE	127,133	100,000	127	11
Grant \$/Appropriated \$	0.692	0.667	104	7
Total Resources, \$/FTE	327,720	250,000	131	14
Refereed Pubs./FTE	4.10	3.00	137	14
Theses and Diss./FTE	0.91	1.00	91	8

On average, ARD units exceeded the goals by 4 to 37 percent during FY 2001. The only goal that was not achieved was the number of theses and dissertations completed per research FTE. In the past, this goal was routinely achieved by our units, but the decline in graduate enrollment has resulted in fewer graduate students completing their degree programs. More than one-half of our units exceeded most of the goals. Average outputs from our units during the past five years are:

Indicator	FY 97	FY 98	FY 99	FY 00	FY 01
Appropriated \$/FTE	188,847	176,916	166,315	180,694	200,587
Grant/Contract \$/FTE	115,902	130,881	103,401	102,513	127,133
Grant \$/Approp. \$	0.612	0.703	0.612	0.570	0.692
Total Resources, \$/FTE	297,702	307,797	269,719	283,207	315,998
Refereed Pubs./FTE	3.56	3.54	3.39	3.51	4.10
Theses-Diss./FTE	1.45	1.29	1.16	0.85	0.91
Fed. Grant Proposals/FTE	1.32	1.00	0.94	1.12	0.92
Tot. Grant Proposals/FTE	6.94	5.81	6.43	7.94	10.08

On average, ARD units are performing well. Total resources available per research FTE are now greater than \$300,000, the standard used by USDA-ARS for support of their scientists. This level of support is the result of continued efforts by faculty to obtain external grants and contracts. Outputs of refereed publications continue to be strong as are the number of total grant proposals per FTE submitted by faculty. There has been a long-term decline in the number of theses and dissertations completed per research FTE because of declining numbers of graduate students. There appears to be considerable opportunity for growth in the number of federal agency grant proposals submitted per research FTE. Success in obtaining federal grants is essential given the declining level of state support available for our research programs.

Status of FY 2003 CSREES Appropriations

Both the House and Senate Appropriations Committees have completed work on the FY 2003 CSREES appropriation. A summary of the appropriations is listed in the chart in the next column. We are pleased that the Appropriations Committees have proposed increases in formula funds, the National Research Initiative, the Sustainable Agriculture Research and Extension program, and a few other smaller research programs. It is regretful that both the House and Senate Appropriations Committees have eliminated IFAFS funding for FY 2003.

Program	FY 2002 Appropriation	FY 2003 House Action	FY 2003 Senate Action
----- \$, millions -----			
Formula Programs			
Hatch Act	180.15	182.00	185.55
McIntire-Stennis Forestry	21.88	23.00	22.54
Evans-Allen	34.60	36.00	35.64
Animal Health and Disease	5.10	5.10	5.10
Special Research Grants			
Expert IPM Decision Support	0.18	0.18	0.18
Global Change	1.40	2.00	2.50
IPM and Biological Control	2.73	2.73	2.73
Minor Crop Pest Mgmt. (IR-4)	10.49	11.00	10.49
Minor Use Animal Drugs	0.59	0.59	0
National Biol. Impact Assessment	0.25	0.25	0.25
Pest Management Alternatives	1.62	1.62	1.62
State Specific Grants	94.21	99.91	101.48
National Research Initiative	120.45	130.00	163.99
Other Research			
Critical Ag Materials	0.720	1.50	
Aquaculture Centers	4.00	4.00	5.00
Sustainable Ag Res and Edu	12.50	12.50	15.00
Supplemental and Alternate Crops	0.92	1.04	1.00
1994 Research Program	1.00	1.20	1.00
Joe Skeen Rangeland Restor Institute	0	2.25	0
Federal Administration	21.68	27.06	26.51

Given below are the House and Senate FY 2003 Appropriations for the Integrated Activities programs. These grants must contain integrated research and extension activities. Some programs have been newly added to the Integrated Activities appropriation for FY 2003.

Program	FY 2002 Appropriation	FY 2003 House Action	FY 2003 Senate Action
----- \$, millions -----			
Section 406 Legislative Authority			
Water Quality	12.97	12.97	12.97
Food Safety	14.97	14.97	14.97
Regional Pest Mgmt Centers	4.63	4.53	4.53
Crops at Risk from FQPA	1.50	1.50	1.50
FQPA Risk Mitigation for Food Crops	4.89	4.89	4.89
Methyl Bromide Transition	2.50	3.50	3.00
Organic Transition	1.50	2.50	1.75
Agriculture Technologies	0	0	2.60
Other Legislative Authorities			
International Science and Edu.	0	1.00	0
Critical Issues	—	0.50	0.50
Regional Rural Dev. Centers	—	1.51	1.51
Section 401 Activities	0	0	60.00

The differences in appropriation levels in the House and Senate versions of the CSREES appropriation will be rationalized in the Conference Committee. After final approval by the full House and Senate, the Conference Committee recommendation will be submitted to the President for signature. When signed, the appropriations bill will become effective October 1, 2002.

Nebraska Research Initiative Grants

Thirty-nine proposals were received from the four campuses for funding in the third phase of the Nebraska Research Initiative (NRI) reallocation project. IANR faculty receiving funding for the current fiscal years include:

New Grants for 2002-2003:

Dr. Patrick Shea (School of Natural Resource Sciences)
 "Building Surface Analysis into a New University Infrastructure in Environmental Science"
 Amount Received: \$280,000

Dr. Tom Clemente (Agronomy and Horticulture Department)
 "Production of Value Enhanced Soybean Oil Through Biotechnology"
 Amount Received: \$198,260

Dr. Milford Hanna (Biological Systems Engineering)
 "Novel Research and Development Opportunities in the Field of Encapsulation of Chemicals and Biochemicals Via Utilization of Biodegradable and Glassy Polymers"
 Amount Received: \$150,000

Continuation of NRI allocation for 2002-2003:

Dr. Jim Van Etten (Plant Pathology)
 "Gene Expression and Signaling in Plants"
 Amount Received: \$386,752

Undergraduate Honors Research Program

Funds for the FY 2003 Undergraduate Honors Student Research Program have been allocated to units for support of student research projects. This program is open to junior and senior University Honors Program students proposing to work with a faculty research mentor who has an ARD appointment. Eight proposals were received and six were funded. The following students have received funding:

Paul Timm (Agricultural Leadership, Education and Communication) \$2,492
 Researcher: Dr. Susan Fritz
 "A Study of the Human Capital Development Impact of Career and Technical Education on Rural Nebraska"

Shauna Bose (Biochemistry Department) \$2,500
 Researcher: Dr. Tiffany Heng-Moss
 "An Investigation of Biochemical/Physiological Mechanisms"

Kimberly Ryland (Biological Systems Engineering) \$2,500
 Researcher: Dr. Curtis Weller
 "Estimation of Convective Heat Transfer Coefficient of Various Meat Cuts Geometrics in Different Cooling Environments"

Elizabeth E. Shubert (Nutritional Science and Dietetics) \$2,500
 Researcher: Dr. Janos Jempleni
 "Identification of Biotinylation Sites in Histone H4"

Aaron Pierce (Veterinary and Biomedical Sciences) \$2,500
 Researcher: Dr. Marjorie Lou
 "Irreversible Oxidative-Damaged Protein Thiols in Aging and Cataractous Eye Lenses"

Karen J. Lee (Veterinary and Biomedical Sciences) \$2,500
 Researcher: Dr. Jeff Cirillo
 "Role of the *Legionella pneumophila* Invasion Gene *enhC* in Pneumonia"

Research Authorizations in the 2002 Farm Bill

An analysis of the 2002 Farm Bill indicates there are a number of new authorizations for agricultural and natural resources research programs. Implementation of the programs is dependent upon action by the House and Senate Appropriations Committees; however, many efforts are being made to obtain appropriations based on the authorizations in the Research Title of the Farm Bill.

Some of the highlights of research authorizations in the Farm Bill include:

- ❖ The authorization for the National Research Initiative was continued.
- ❖ The Initiative for Future Agricultural and Food Systems (IFAFS) was increased. Funding provided in the mandatory account was \$120 million for FY 2003, \$140 million for FY 2004, \$160 million for FY 2005 and \$200 million for FY 2006 and beyond.
- ❖ High priority research and extension initiatives listed include: Environment and Private Land Research and Extension; Animal Infectious Disease Research; Water and Air Quality Research and Extension; Carbon Cycle Research, Plant Gene Expression and Biotechnology Risk Assessment Research.
- ❖ A new Biosecurity subtitle was included. The Biosecurity thrust addresses Biosecurity Planning and Response (detection methods, communications systems, etc.) and Facilities

grants to provide improved laboratories for biosecurity research and to enhance security of existing facilities.

- ❖ A new Energy Title that authorizes \$450 million per year for research on bioenergy, biomass, and biofuel research and development. Included in this title is an authorization for carbon dioxide sequestration and greenhouse gas exchange research.
- ❖ The Research Title also contains an authorization for a Research Equipment Grant program. This is the first equipment grant program to be authorized in USDA.
- ❖ Included in the Farm Bill was a statement of Congressional intent to double agricultural research funding over the next five fiscal years. This intent is similar to that used to justify large increases in funding for NIH and NFS.

New or Revised Projects



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

NEB-10-148 (Agriculture Economics) Impact Analysis and Decision Strategies for Agricultural Research

Investigator: Richard Perrin

Status: New Hatch project that contributes to Multi-State project NC-1003 effective October 1, 2001

NEB-12-260 (Agronomy and Horticulture) Resource-Efficient Management of Summer Annual Dryland Cereal Crops in Nebraska

Investigator: S.C. Mason

Status: Revised Hatch project effective June 1, 2002

NEB-12-289 (Agronomy and Horticulture) Precise Nutrient Management in Corn-Based Systems

Investigator: A.R. Dobermann

Status: New Hatch project effective January 1, 2002

NEB-13-153 (Animal Science) Measuring and Improving the Quality, Consistency, and Uniformity of Traits that Influence Meat Value

Investigator(s): C.R. Calkins and R.W. Mandigo

Status: New Hatch project effective March 2, 2002

NEB-14-119 (Veterinary and Biomedical Sciences) Functional Genomic Analysis of Bovine Viral Diarrhea

Investigator: R.O. Donis

Status: New Competitive grant effective December 15, 2001

NEB-14-121 (Veterinary and Biomedical Sciences) Evolving Pathogens, Targeted Sequences, and Strategies for Control of Bovine Respiratory Disease

Investigator: S. Srikumaran

Status: New Hatch project that contributes to Multi-State project NC-107 effective October 1, 2001

NEB-15-098 (Biochemistry) Genetic Modification of Chloroplast Rubisco

Investigator: R.J. Spreitzer

Status: New Hatch project effective June 1, 2002

NEB-16-093 (Food Science and Technology) Alliance for Food Protection

Investigator: S. Hefle

Status: New Special grant effective May 1, 2002

NEB-17-062 (Entomology) Arthropods Associated with Buffalograss and Other Turfgrasses in Nebraska

Investigator: F.P. Baxendale

Status: Revised Hatch project effective January 1, 2002

NEB-40-016 (School of Natural Resource Sciences) Developing Drought Mitigation and Preparedness Technologies for the U.S.

Investigator: D.A. Wilhite

Status: New Special grant effective July 1, 2002

NEB-43-069 (West Central Research and Extension Center) Environmental Impact of Land Application of Animal Manure as Fertilizer for Irrigated Corn

Investigator(s): J.O. Payero, S. Ensley and G.W. Hergert

Status: New Hatch project effective September 1, 2001

NEB-48-029 (South Central Research and Extension Center) Resource-Efficient Cropping Systems Research for South Central Nebraska's Irrigated Agro-Ecological Zone

Investigator: R.W. Elmore

Status: New Hatch project effective February 12, 2002

NEB-91-055 (Nutritional Science and Dietetics) Lead Status, Food Provision Competence and the Parenting of Iron Deficient Children Enrolled in WIC

Investigator: K.L. Stanek Krogstrand

Status: New State project effective July 1, 2002

NEB-94-028 (Textiles, Clothing and Design) Process and Property Investigations of Fibers Synthesized from Nebraska's Agricultural Products and By-Products

Investigator: Y. Yang

Status: New Hatch project effective April 1, 2002

Proposals Submitted for Federal Grants



The following is a listing of proposals that were submitted the past few months by faculty for federal grant programs. While not all grants will be funded, we are appreciative of faculty members' outstanding efforts in submitting proposals to the various agencies.

Sally Mackenzie — NSF — Components of the Plant Mitochondrial DNA Metabolism Apparatus and their Functional Analysis — \$866,261

Thomas Powers — USDA through Texas Department of Agriculture — Nematode Survey #2 — \$42,500

Qi "Steve" Hu — NOAA — Diagnostic and Modeling Study of Land Memory Effects on Summer Monsoon Rainfall in the Southwestern U.S. — \$296,933

Robert J. Spreitzer — USDOE — Role of the Rubisco Small Subunit — \$445,876

Ruma Banerjee — Department of Health and Human Services — Gene Nutrient Interactions in Hyperhomocysteinemia — \$72,500

Janos Zempleni — NIH — Regulation of biotinidase-dependent pathways — \$105,893



Grants and Contracts Received June and July, 2002

Agronomy/Horticulture

Brian Beecher — Layman Fund via UN Foundation	\$10,000
George Graef — University of Illinois	25,333
Paul Read — Small Fruit Research Fund via UN Foundation	20,888
Paul Read — Anna Elliott Fund via UN Foundation	14,580
Roy Spalding — Nebraska Department of Environmental Quality	50,000
James Specht — USDA/ARS	31,500
Paul Staswick — National Science Foundation	119,752
Miscellaneous grants under \$10,000 each	83,190

Animal Science

Mary Beck — Roche Animal Nutrition and Health	48,250
Chris Calkins — Hormel Foods	48,213
Chris Calkins — National Cattlemen's Beef Association	23,729
Roger Johnson — Monsanto	103,320
Steve Jones and Chris Calkins — National Cattlemen's Beef Association	34,200
Steve Jones — National Pork Board	28,000
Terry Klopfenstein — Nutrition Physiology Corporation	50,000
Roger Mandigo — Nebraska Beef Council	18,916
Sheila Scheideler — University of Kentucky	57,369
Sheila Scheideler — Pioneer Hybrid International, Inc.	20,435
Miscellaneous grants under \$10,000 each	24,508

Agricultural Research Development Center

Dan Duncan — Barta Brothers via UN Foundation	25,000
Miscellaneous grants under \$10,000 each	3,000

Biochemistry

Ruma Banerjee — NIH	267,972
Raymond Chollet — NSF	145,000
Vadim Gladyshev — NIH	668,833
Vadim Gladyshev — University of Illinois	15,000
Stephen Ragsdale — NIH	262,369
Stephen Ragsdale — USDOE	111,000
Robert Spreitzer — USDOE	97,000
Don Weeks — NSF	120,000
Don Weeks — ConAgra	225,000
Miscellaneous grants under \$10,000 each	16,250

Biological Systems Engineering

Miscellaneous grants under \$10,000 each	337
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Entomology

Blair Siegfried — Monsanto Company	12,000
Miscellaneous grants under \$10,000 each	71,195

Food Science and Technology

Susan Hefle — USDA/CSREES	137,035
Miscellaneous grants under \$10,000 each	34,294

Northeast Research and Extension Center

Miscellaneous grants under \$10,000 each	28,800
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Panhandle Research and Extension Center

Gary Hein — Anna Elliott Fund via UN Foundation	11,040
John Smith — Unrestricted Gift	12,500
Robert Wilson — Anna Elliott Fund via UN Foundation	14,000
Miscellaneous grants under \$10,000 each	46,090

Plant Pathology

Miscellaneous grants under \$10,000 each	1,500
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School of Natural Resource Sciences

Xun-Hong Chen and James Goeke — USGS	16,446
Anatoly Gitelson — NASA	89,949
Kyle Hoagland — Nebraska Game and Parks	33,000
Kyle Hoagland — National Park Service	20,900

South Central Research and Extension Center

Miscellaneous grants under \$10,000 each	24,000
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Veterinary and Biomedical Sciences

Jeff Cirillo — California Pacific Medical Center	69,185
Gerald Duhamel — University of Minnesota	98,928
Marjorie Lou — NIH	326,526
Fernando Osorio — Pig Improvement Company	44,955
Fernando Osorio — National Pork Board	25,000
Miscellaneous grants under \$10,000 each	12,220

West Central Research and Extension Center

Miscellaneous grants under \$10,000 each	19,000
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Grand Total \$3,917,507

Hardin Distinguished Graduate Fellowship for 2002-2003

The recipient of the Hardin Distinguished Graduate Fellowship for 2002-2003 is **Tulio Macedo**. The fellowship is made possible by an endowment established at the University of Nebraska Foundation by former University of Nebraska Chancellor Clifford Hardin to support outstanding graduate students doing research in plant physiology. He will receive a \$2,000 supplement to his graduate assistantship and the Entomology Department will receive \$1,000 of operational support for his research program.

Macedo is completing his Ph.D. in the Department of Entomology. His dissertation deals with "addressing the physiological mechanisms of plant resistance to aphids and abiotic plant stress." Tulio's work will provide important information on the interactions of biotic and abiotic stress on plants' physiology and the results have major implications for basic and applied research on plant resistance to aphids, and possibly

other pests. His Ph.D. research deals with findings on two levels — (a) plant breeding for aphid resistance (in many species) increasingly is based on indices of chlorophyll content; (b) aphids have long been an important group for modeling the evolution of plant resistance in response to herbivory.

Tulio has been very active in youth outreach education, department activities, and undergraduate teaching. He has an excellent future as a scientist and educator and a remarkable record of accomplishments well beyond that of what is expected from a graduate student. He has worked with his advisor and students within the Lincoln Public Schools and Folsom Children's Zoo developing educational programs about insects as well as working with students to motivate learning in children with serious emotional and behavioral problems. Leon Higley is his advisor.

Widaman Trust Distinguished Graduate Assistant Award



The Widaman Trust was established in 1975 through a generous gift provided to the University of Nebraska Foundation by Ms. Blanch Widaman. Ms. Widaman asked that the income from the trust be used by UNL for basic research in agriculture and that the funds support people rather than purchase supplies and/or equipment. She suggested that the money be used for scholarships or fellowships for graduate students conducting basic research in agriculture.

The criteria established for the Widaman Trust Distinguished Graduate Assistant Award specifies that only 5 percent of the graduate students in a department can receive the recognition and that the awardees must demonstrate outstanding scholarship and excellence in research. We congratulate the following graduate students for receiving the Widaman Trust Distinguished Graduate Student Award for 2002-2003:

Name: Fufa Hundera Birru
 Thesis area: Plant Breeding/Genetics
 Department: Agronomy/Horticulture
 Advisor: P. Stephen Baenziger

Name: Muharrem Dilbirli
 Thesis area: Plant Breeding/Genetics
 Department: Agronomy/Horticulture
 Advisors: Kulvinder S. Gill

Name: Deepak Sidhu
 Thesis area: Molecular Genetics
 Department: Agronomy/Horticulture
 Advisors: Kulvinder S. Gill

Name: Federico A. Vartorelli
 Thesis area: Plant Breeding/Genetics
 Department: Agronomy/Horticulture
 Advisors: George Graef

Name: Hushton C. Block
 Thesis area: Ruminant Nutrition
 Department: Animal Science
 Advisor: Terry Klopfenstein

Name: Mohammad A. Jalal
 Thesis area: Poultry Nutrition
 Department: Animal Science
 Advisor: Sheila E. Scheideler

Name: Wanda M. Kreikemeier
 Thesis area: Ruminant Nutrition
 Department: Animal Science
 Advisors: Terry Mader

Name: Raymond A. McDonald
 Thesis area: Ruminant Nutrition
 Department: Animal Science
 Advisors: Terry Klopfenstein

Name: Yih-Chern Horng
 Thesis area: Biochemistry
 Department: Biochemistry
 Advisor: Ruma Banerjee

Name: Monica Vlasie
 Thesis area: Biochemistry
 Department: Biochemistry
 Advisor: Stephen W. Ragsdale

Name: Sandun D. Fernando
 Thesis area: Biological Engineering
 Department: Biological Systems Engineering
 Advisor: Milford Hanna

Name: Girish Ganjyal
 Thesis area: Food Engineering
 Department: Biological Systems Engineering
 Advisor: Milford Hanna

Name: Marcos Sanchez
 Thesis area: Food Science
 Department: Food Science and Technology
 Advisor: Shelly McKee

Name: Changbin Chen
 Thesis area: Plant Pathology
 Department: Plant Pathology
 Advisor: Marty Dickman

Name: Andres Vina
 Thesis area: Natural Resource Sciences
 Department: School of Natural Resource Sciences
 Advisor: Anatoly Gitelson

Diane says

You draw nothing out of the bank of life except what you deposit in it.