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Agricultural Research Division News

Office of the Dean, 207 Ag Hall, P.O. Box 830704, Lincoln, NE 68583-0704, Phone (402) 472-2045, FAX (402) 472-9071

April 2005 Volume 38, Number 2

Comments from the Dean

Vice Chancellor Owen's column in the March issue of *The Leading Object* discussed the President's proposal to phase out Hatch Act, McIntire-Stennis, and Animal Health and Disease funding in the USDA/CSREES budget starting in FY 2006 (effective October 1, 2005). The proposal calls for removing one-half of the Hatch Act and McIntire-Stennis (forestry research) funds in FY 2006 and the remaining one-half of the funds in FY 2007. The Animal Health and Disease program would be eliminated effective FY 2006. These programs are formula-driven allocations of funds to state agricultural experiment stations and forestry and veterinary medicine colleges, similar to block grants that Congress provides to states for a variety of purposes. The Office of Management and Budget within the Executive Branch has long opposed formula (base) funds since USDA bureaucrats are unable to direct how these funds will be used. Rather, the use of these funds is at the discretion of the directors of agricultural experiment stations and deans of forestry and veterinary medicine. In the case of Hatch Act funds, this process has worked very well since 1887 and has helped the United States develop the most productive agriculture in the world. Recent studies have established a 50% annual rate of return on investment for Hatch Act funds. In addition to the proposed reduction in formula funds, the President's proposal also recommends that the programs in the Integrated Account (water quality, food safety, etc.) be moved into the National Research Initiative.

The President's budget proposes to increase the National Research Initiative (NRI) using the Integrated Account and Hatch Act funds. In addition, the indirect cost rate that could be charged on NRI grants would be increased from the current 20% to the federally negotiated rate for the campus. To offset some of the losses in the Hatch Act funds, the President's budget proposes to create a new $ 75 million competitive grants program restricted to faculty in land-grant universities.

Most state agricultural experiment station directors are opposing the proposed changes in funding for agricultural research. Listed below are the reasons for opposing the changes:

- Formula funds provide the infrastructure that allows researchers to be productive. In Nebraska, Hatch Act funds are used primarily for GRAs, operating funds, technician salaries, equipment maintenance, etc. Loss of these funds will require faculty to compete for all of the funds needed for their research project, including much of the infrastructure that is currently provided. Formula funds also are essential for long-term projects such as crop and animal breeding, crop rotations, deficit irrigation, climatology, and best management practices for soil and water conservation. Formula funds also provide the flexibility for immediate response to emerging issues such as a new disease or insect infestation. It is obvious that competitive grant programs do not provide continuity for long-term studies or provide the flexibility for addressing emerging issues.
- All of the Hatch Act funds are provided to state agricultural experiment stations. Less than 60% of the NRI funds go to faculty at land-grant universities. When the indirect cost cap is eliminated, competition for NRI funds will intensify since this will bring proposals from private universities that traditionally have indirect cost rates of 70% or more. In the end, much less actual research will be conducted than is the case with a mix of formula and competitive grant funding. In addition, faculty will be devoting much more time to writing grant proposals than they currently do.
- Competitive grant programs drive the research agenda. Nebraska has needs for research that are outside of the priorities established by federal funding agencies. Without adequate resources, our faculty will be hard pressed to attack the problems that plague our clientele.
- The Research and Education Title of the last Farm Bill mandated significant multi-functional, multi-state and multi-disciplinary programs. For example,

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ARD and CED must spend 25% of our federal formula funds on multi-functional (integrated) programs and on multi-state programs. It is interesting to find that the President's budget proposal will remove all of the research funding for integrated and multi-state programs.

- Cooperative Extension also receives significant amounts of formula funds. If the Executive Branch is successful in removing research formula funds, there is no doubt that the extension Smith-Lever funds will be subject to reduction in the next fiscal year.

ARD has been part of a national effort to inform decision makers regarding the impacts of the President's proposed changes for agricultural research funding. Within Nebraska, the major commodity organizations and checkoff boards have contacted our Congressional Delegation regarding the impacts of the Hatch fund reductions. In addition, some of the other farm organizations have also visited with our Members of Congress. The Nebraska representatives to the Council of Agricultural Research, Extension and Teaching (CARET) personally engaged our Congressmen and Senators on this issue. The reduction in Hatch Act and related funds has attracted the attention of the media. Positive stories regarding the need for formula funds have appeared in both Nebraska and national newspapers and farm magazines.

It is our hope that we have provided enough information to ensure that Congress does not support the President's position on formula funds. Even if we win this battle, there are likely other similar battles to be fought in the future since the Office of Management and Budget is so opposed to formula funds. In their minds, only competitive grants result in high quality research. This assumption has been proven incorrect by more than 50 studies of return on investment from formula funds. Unfortunately, the bureaucrats in the Office of Management and Budget do not always listen to facts.

Darrell W. Nelson
Dean and Director

President's FY 2006 Budget Request for Research

In early February, the President's budget proposals for FY 2006 were released. Included in the massive budget document were research and development funding proposals for all of the federal agencies. A table in the next column outlines the budget recommendations for several federal agencies from which ARD faculty obtain research grants:

Agency	*FY 2005 level*	*FY 2006 request*	*% change*
	------- $ in millions -------		
National Institutes of Health	28,650	28,845	0.7
National Science Foundation	4,221	4,333	2.7
Department of Defense - Basic	1,513	1,318	- 12.9
Department of Defense - Applied	4,850	4,139	- 14.6
Department of Energy - Science	3,600	3,463	- 3.8
Homeland Security - University	70	60	- 9.1
NOAA	3,919	3,586	- 8.5
U.S. Geologic Survey	935	934	- 0.2
USDA/CSREES - Research	621	505	- 18.7
Base funds (Hatch, etc)	242	139	- 42.8
Competitive grants	180	325	81.0
Other research	63	23	- 63.6

It is obvious that the budget deficit is driving the reductions in research funding in most of the federal agencies. The budget growth in NIH slowed dramatically in FY 2005 and is projected as minimal for FY 2006. We are pleased to see the modest projected growth in the NSF budget while most of the other agencies are projected to have reduced research funding. The *Comments from the Dean* section contains a complete discussion of the USDA/CSREES budget proposals and our actions to resist the proposed changes.

The proposals for FY 2006 are a marked change from the situation for FY 2005. The federal research budget increased by 4.8% in FY 2005, as compared with FY 2004. In FY 2005, Homeland Security, Department of Defense, and USDA research appropriations increased by 19, 9, 7.9, and 7.8%, respectively. Other federal agencies had modest increases in their research appropriations.

Unit Performance Characteristics

Since 1988, ARD has been tracking unit budget allocations and performance characteristics. The primary reason for accumulating this data was to ascertain if our research portfolio was making progress on a year-to-year and a long-term basis. More recently, the University of Nebraska Board of Regents has required that each campus develop "Quality Indicators". The ARD data base is very helpful in providing the "Quality Indicator" data requested at the UNL level.

For FY 2005, on average ARD is providing units with almost $215,000 per faculty research FTE. Of this amount, more than $176,000 per FTE is expended for faculty and staff salaries and fringe benefits. On average, ARD is providing units with more than $17,700 per faculty research FTE for GRA stipends and student wages and $22,400 per research FTE for operating. ARD provides on average 1.37

managerial/professional and office/service FTE per faculty research FTE. The distribution of these resources among departments is strongly dependent upon the costs associated with conducting research in the discipline. For example, animal research programs are much more costly than social science research programs since animals require 24/7 attention the year around.

The average performance characteristics of ARD units for FY 2002, 2003 and 2004 are:

Characteristic	*FY 2002*	*FY 2003*	*FY 2004*
Total appropriated $/research FTE	199,890	204,950	214,743
No. refereed publications/research FTE	4.09	3.47	4.56
No. theses/dissertations/research FTE	1.00	0.99	1.23
Competitive grant $/research FTE	80,575	105,390	98,081
Total grant $/research FTE	140,142	170,607	159,641
Total grant $/total appropriated $	0.73	0.88	0.81
No. competitive grant proposals/ research FTE	1.47	1.63	1.30
No. total grant proposals/research FTE	10.51	5.60	6.88
Total research $/research FTE	340,032	375,002	362,554

There is variation in the average unit grant income from year to year with FY 2003 being the highest of the three years. Continued focus on federal competitive grants will be needed to ensure that our research programs remain well funded. We are pleased to see that refereed publications per research FTE was again above 4.0 as was the case in FY 2003. It was also gratifying to find that the number of students receiving M.S. and Ph.D. degrees per research FTE also increased from FY 2003 to FY 2004. We are concerned about the drop in the number of competitive grant proposals submitted per research FTE. This could foretell a decrease in competitive grant funding for FY 2005. Total funding per research FTE (appropriated plus grants) exceeds $360,000 for FY 2004. At this level of funding, taxpayers have a high expectation for many accomplishments and impacts and that all faculty with research appointments be productive.

Faculty and Staff Guide for Applying and Receiving Income from Industry and Commodity Boards

Much confusion has occurred regarding what defines a grant versus a donation and the processes involved with properly applying, receiving and tracking this income. This guide attempts to answer those questions. **Faculty and staff need to work with their respective Business Center Managers and/or Grants Specialists prior to requesting either donations or grants to ensure correct interpretation and implementation of policies.**

Definitions:

Donation: A donation is a sum of money given by industry or commodity boards to support activities such as field days, youth days and other similar activities. Donations do not have reporting requirements or any other defined expectations other than the funds will be used for the specified purpose. An example would be funds solicited for a meal at an educational program, funding to pay for busses to bring youth to activities, etc.

Grants: A grant requires reports and has defined expectations. The granting entity usually issues a call for RFPs and has a defined process and forms for submittal. Examples would include RFPs from Commodity Boards, grants from industry to test products, etc.

Process for Accepting and Tracking Donations:

Donation income can be recorded in two ways. One way is to record the income on the Form for Industry and Foundation Income and place the funds in a Fund Source 27 account (WBS). It is strongly suggested that departments develop child accounts of this 27 account to track funds for specific programs. In some instances private companies may wish to receive a receipt for income tax purposes for the donation. If that is the case, they should donate the funds to the UN Foundation in a department-specific account. The funds would then be transferred from the foundation account to a UNL WBS account.

Commodity Board Grant Application Process:

A RFP will be distributed to all faculty at times specified by the commodity boards. The RFP shall contain forms and further information regarding the specific grant application. Applications will be considered complete only when the information requested is completely filled out and accompanied by a routing form signed by the PI(s) and the cognizant Department Head(s).

Commodity Board grants do not require a designated match from UNL and PI should not list a cash or in-kind match or other institutional investment. This is a change from past practices. New budget forms will be developed to address this change.

Extension/educational grant applications shall be forwarded to the Extension Dean's office for project approval. Research grant applications shall be forwarded to the ARD Dean's office for approval. The ARD office shall compile and coordinate submittal of all grant applications to commodity boards.

Policy for Conducting Field Trials of Regulated GMO Material

We want to remind all faculty that a new policy is in place for anyone conducting field trials with regulated GMO materials. This would include testing regulated material for companies. The policy and a field trial form can be found on the ARD web-site at: http://ard.unl.edu/

If you need more information please contact Dan Duncan.

Grants and Contracts Received for January and February 2005

Agricultural Economics

Richard Clark and **CARI** — NE Community Foundation	$17,980
Richard Clark — Farm Credit Services	11,250

Agronomy and Horticulture

Ismail Dweikat and **Fabio Pedraza-Garcia** — Charles Baker Endowment	12,000
Roy Spalding — Nebraska Department of Agriculture, USEPA	25,000
Martha Mamo, Timothy Kettler and **Dennis McCallister** — NSF	74,869
Martha Mamo — Alan and Irene Williams Endowment	15,000
Miscellaneous grants under $10,000 each	25,743

Animal Science

Rick Funston — Nebraska Soybean Board	21,997
Daniel Pomp — Biotechnology Research and Development Corporation	143,128
Galen Erickson, Ivan Rush and **Dave Smith** — USDA Special Grants	122,378
Miscellaneous grants under $10,000 each	15,500

Biochemistry

Vadim Gladyshev — NIH	253,750
Vadim Gladyshev — NIH	69,959
Ruma Banerjee — NIH, NIDDKD	252,000

Biological Systems Engineering

Greg Bashford and **Susan Hallbeck** — Heartland Center for Occupational Health and Safety	4,812
Derrel Martin — U.S. Department of Interior - Bureau of Reclamation	140,400

Center for Applied Rural Innovation

Alan Baquet — USDA	83,477

Entomology

Tiffany Heng-Moss — International Turf Producers Foundation	7,500
Lance Meinke — Syngenta Seeds, Inc	26,485

Food Science and Technology

Lloyd Bullerman — Ohio State University Foundation	20,000
Miscellaneous grants under $10,000 each	8,676

Nutrition and Health Sciences

Janos Zempleni — NIH	261,267

Northeast Research and Extension Center

Keith Jarvi — Syngenta Seeds, Inc	7,000

Panhandle Research and Extension Center

John Smith — Sugarbeet Profit	12,000
Miscellaneous grants under $10,000 each	83,385

Plant Pathology

James Van Etten, David Dunigan and **B. Kronschnabel** — NIH	143,489

Plant Science Initiative

Sally Mackenzie — Oak Smith Fund	11,426

School of Natural Resources

Larkin Powell — National Park Service	77,109
David Gosselin, Ed Harvey and **Matt Joeckel** — EPA	56,100
R. Matthew Joeckel — USGS	20,000
Larkin Powell — Nebraska Game & Parks Commission	56,250
Scott Hygnstrom — Nebraska Game & Parks Commission	45,000
Ken Hubbard — NOAA/OGP/OAR/DOC	18,000

Statistics

Kent Eskridge — Nebraska Department of Health, CDC Funds	15,160

Veterinary Basic Science

Jeffrey Cirillo — NIH - NIAID	55,290
Fernando Osorio and **Asit Pattnaik** — USDA/CSREES	87,304
David Steffen — Nebraska Game and Parks Commission	12,400
Jeffrey Cirillo — NIH, NIAID	290,000
Miscellaneous grants under $10,000 each	2,500

West Central Research and Extension Center

Jose Payero — U.S. Bureau of Reclamation	6,000
Total	**$2,611,584**

Proposals Submitted for Federal Grants – January and February 2005

The following is a listing of proposals that were submitted during January and February 2005 by faculty for federal grant programs. While not all grants will be funded, we are appreciative of the faculty members' outstanding efforts in submitting proposals to the various agencies.

Fernando Osorio and **Asit Pattnaik** — NRI — Use of a green-fluorescent protein-expressing strain of Porcine Reproductive and Respiratory Syndrome Virus for the study of PRRSV pathogenesis and in — $233,965

John Yohe — USAID — International sorghum/millet collaborative research support program — $300,000

James Brandle — NRI — A shelterbelt planning tool for the midwestern United States — $125,1023

Azzeddine Azzam, Konstantinos Giannakas, Jeff Royer, Sandra Scofield, and **Amalia Yiannaka** — NRI — Preparing women for leadership in the food industry through training in ag and food industrial organization — $128,000

Lance Meinke, Blair Siegfried, and **John Foster** — ARS — Diabrotica genetics consortium

Charles Francis — NRI — Profitable and environmentally sound crop rotations for the Western Corn Belt — $500,000

Dean Eisenhauer, Bill Zanner, Scott Hygnstrom, and **Michael Dosskey** — NRI — Beaver in the agricultural landscape: Restoration of ecosystem functions — $499,410

Milford Hanna — NRI — Oxidatively and thermally stable polymerization resistant industrial lubricants from chemically modified soybean oil and its methyl esters (Through Mississippi State) $101,676

Milford Hanna — NRI — Improving biodegradable foams from starch-polymer blends (Through University of Wisconsin) — $233,228

Craig Allen — U.S. Geological Survey — Monitoring of amphibians within the rainwater basin sub-ecoregion: spatial and anthropogenic influences on occurrence and community composition — $70,857

Robert Spreitzer — NSF — Rubisco phylogenetic engineering — $628,313

Narendra Reddy and **Abdus Salam** — NRI — A new starch crosslinking mechanism as an alternative to starch acetate for biomaterials — $248,602

Milford Hanna, Yiqi Yang, and **Girish Ganjyal** — NRI — Environmentally friendly starch, pla-nanoclay composites with enhanced physical, mechanical, thermal and adsorption properties — $273,178

Yiqi Yang — NRI — Cornhusks for natural cellulose fibers and biofuels — $308,124

Donald Weeks — NSF — Genetic and molecular mechanism regulating the carbon concentrating mechanism in *Chlamydomonas reinhardtii* — $1,022,644

Julie Stone — NSF — Integrative analyses of SBP protein-mediated gene expression in plant development and stress response — $471,064

Ivan Rush and **Dave Baltensperger** — NRI — Consortium for alternative crops – Utilization of pulse crops as a feed resource in cattle rations (Through South Dakota State) — $80,000

Stephen Taylor, Robert Hutkins, Andrew Benson, Lloyd Bullerman, and **Susan Hefle** — NRI — Ph.D. National Need Fellowships in food safety and Toxicology at the University of Nebraska — $207,000

Jeffrey Cirillo — NIH/NIAID — Molecular mechanisms of Francisella invasion — $598,200

Paul Staswick — NRI — Important new roles for Jasmonic Acid conjugating enzymes in plants — $224,430

Steven Harris — NSF — Regulation of formin function in fungal hyphae — $433,270

Tom Clemente — NSF — Collaborative research: elucidation of the isolavonoid phytoalexin pathway in pea — $100,095

Clinton Jones — NIH — Regulation of encephalitis by the HSV-1 LAT locus — $365,000

James Van Etten and **James Gurnon** — NIH — Engineering DNA nicking endonucleases — $99,105

Melanie Simpson — NIH — Role of hyaluronan matrix in prostate cancer progression — $1,260,575

Martin Dickman and **Donald Becker** — NSF — The role of proline metabolism during apoptosis and adaptive stress responses in fungi — $665,385

Greg Somerville — NIH — Environmental regulation of Staphylococcus epidermidis PIA synthesis — $274,000

Asit Pattnaik and **Fernando Osorio** — NRI — Identification and characterization of PRRSV immunogenic subunits using viral vector (Through University of Minnesota) — $60,304

Andrew Benson — NIH — Functional consequences of genome evolution in *E. coli* 0157:H7 — $1,314,000

Andrew Cupp, John Weber, and **Brett White** — NIH — Role of VEGF in testis morphogenesis — $1,778,025

Jose Payero and **David Tarkalson** — NRI — Identification and leaching of tetracyclines and their transformation products in ag soils after land application of manure institute — $97,814

Daniel Walters, Timothy Arkebauer, Madhavan Soundararajan, and **Shashi Verma** — NRI — Separating soil-respired carbon into autotrophic and heterotrophic sources in irrigated and rainfed maize-based systems — $224,400

Viachesav Adamchuk and **Achim Dobermann** — NRI — Determination of field heterogeneity through integrated soil sensing — $499,790

Qi Steve Hu — NSF — Multidecadal alternation of the sources affecting interannual summer rainfall variations — $339,134

John Weber — NIH — Sirt1 and Sepsis in aging mice — $146,000

Stephen Baenziger — ARS — Enhancement of scab resistance in winter wheat by plant breeding and plant transformation — $115,121

Steven Harris, Gary Yuen, and **Liangcheng Du** — ARS — Effects of a novel antibiotic on the growth and production of aflatoxin by *Aspergillus flavus* — $67,920

Gary Yuen — ARS — Evaluation of biological agents for Fusarium head blight control — $23,350

Yan Xia, Kathy Bosch, Gina Kunz, and **Susan Sheridan** — Public Health Service — Risk and protective factors for adolescent dating violence perpetration — $874,508

Joni Griess and **Steve Mason** — SARE — Environmental influence on grain quality of food grade sorghum — $9,560

Rhae Drijber — ARS — Developing technologies to improve soil and nutrient management — $60,000

Steven Taylor — USDA-FSMIP — Implementation of a producer/buyer distribution system — $43,207

George Meyer — Regional IPM — A machine vision method for discriminating and mapping weed populations for improved integrated pest management — $58,675

Tiffany Heng-Moss, Fred Baxendale, and **Blair Siegfried** — USDA-IPM — Investigation of chinch bug resistance to pyrethroids — $288,949

Ofelia Barletta-Chacon — NIH — Mycobacterium tuberculosis clinical isolates and mycobacteriophages from Colombia — $233,727

Suat Irmak, Derrel Martin, Jose Payero, and **Richard Ferguson** — USDA-NIWQ — Precision weighing lysimeters, bowen ratio energy balance system and Eddy Correlation System for improved measurement and prediction of — $580,900

F. Edwin Harvey, Tala Awada, Vitaly Zlotnik, Tim Arkebauer, and **Matt Landon** — U.S. Geological Survey — Relations of riparian vegetation evapotranspiration rates and depth to water and evaporation capture by ground-water pumping — $243,525

Raymond Chollet — NSF — Supplement/Extension (MCB-0520683) to MCB-0130057 Molecular/biochemical investigations of PEPC — $150,000

Stephen Ragsdale — NIH — Enzymology of reductive acetyl-CoA synthesis — $1,807,878

Jeffrey Cirillo — NIH — Virulence mechanisms of *Francisella tularensis* — $1,702,300

David Tarkalson (Through Cornell University) — USDA-BRAGP — Medium-to-long term monitoring of soil quality, residue carbon turnover and the fate of *Bt* proteins in field — $110,000

Gary Hein — ARS — Biologically intensive areawide IPM of the Russian wheat aphid and greenbug agreement — $125,847

Donald Wilhite, Cody Knutson, Hong Wu, Kenneth Hubbard, and **Xun-Hong Chen** — NRI — Hydrologic responses to multiple-year drought and its implications for the availability of water resources in the Platte River Basin — $293,531

Roy Spalding, Dean Eisenhauer, Mary Exner, and **Richard Ferguson** — NRI — Quantification of improved water and nutrient management on nitrate loading to groundwater — $492,255

David Baltensperger and **Lenis Nelson** — USDA — Canola in the Great Plains — $8,000

Tom Clemente — NIH — Efficacy of soybean-based vaccines using a model antigen — $168,245

Kenneth Cassman, Haishun Yang, Suat Irmak, Achim Dobermann, David Tarkalson, Jose Payero, Daniel Walters, Richard Ferguson, and **Derrel Martin** — NRI — Real-time decision support for irrigation management with limited water supply — $348,940

New or Revised Project – January and February 2005

NEB 11-117 Application of fuzzy systems analysis in biological systems engineering
Investigator: David Jones
Status: Hatch project effective June 1, 2004 through May 31, 2009

NEB 44-067 Planting and harvesting systems for sugarbeets, dry edible beans, and chicory
Investigators: John Smith and Michael Kocher
Status: Hatch project effective Feb. 01, 2005 through Feb. 28, 2010

NEB 10-156 Economic analysis of international agricultural trade issues before the World Trade Organization
Investigator: Wes Peterson
Status: Hatch project effective Jan. 1, 2005 through Dec. 31, 2009

NEB 44-068 Improving fertilizer management and recommendations for the Nebraska High Plains
Investigator: Gary Hergert
Status: Hatch project effective Feb. 1, 2005 through Jan. 31, 2010

NEB 13-172 Metabolic bone disease in laying hens: etiology and genomics
Investigator: Mary Beck
Status: Animal Health project effective Oct. 1, 2004 through Sept. 30, 2009

NEB 42-025 Integrated management of problem weeds in Nebraska
Investigator: Stevan Knezevic
Status: Hatch project effective Feb. 1, 2005 through Jan. 31, 2010

NEB 13-171 NE-1022, Poultry production systems: optimization of production and welfare using physiological, behavioral and physical assessments
Investigator: Mary Beck
Status: Multistate project effective Nov. 1, 2004 through Oct. 30, 2009

NEB 12-308 Turfgrass landscape biosensing
Investigator: Garald Horst
Status: Hatch project effective Jan. 1, 2005 through Dec. 31, 2009