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"ARD News February 2006" (2006). *Agricultural Research Division News & Annual Reports*. 92.
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February 2006

Volume 39, Number 1

Comments from the Dean

Dear Colleagues:

The ARD staff have completed publication and distribution of the 119th Annual Report for the Agricultural Research Division. A number of interesting facts are presented in this report. For example, 264 faculty have research appointments; however, ARD has an increasing number of FTE associated with research faculty who are paid from other than state appropriated funds.

During FY 2004, expenditures on ARD projects totaled \$79.9 million. Of this total, federal formula, state appropriated, Nebraska Research Initiative, grants and contracts, and product sales represented various percentages, respectively. During FY 2004, ARD faculty obtained \$46.5 million in research grants and contracts, which represents 35.8% of all research grant and contract funds received by UNL.

ARD faculty published 401 refereed journal articles, 5 research bulletins and 88 books and book chapters during calendar year 2004. In addition, faculty served as advisors for 145 M.S. theses and Ph.D. dissertations during 2004, obtained 1 patent and released 30 unique cultivars or germplasms. ARD faculty also hosted 51 visiting scientists and 30 post-doctoral research associates during 2004. You can access this report on the ARD website - <http://www.ard.unl.edu/report.shtml>.

As I look at this annual report, I cannot help but be both very impressed and very pleased. I am impressed because by any standard, these statistics represent remarkable achievements for a university of our size. I am pleased because I now have the good fortune of working with and for such outstanding faculty, and you have every right to be proud of your accomplishments and productivity. Your hard work is bringing deserved recognition to the University of Nebraska—Lincoln and is contributing to a brighter future for the University and the state. Thanks to all the faculty, staff and students who have contributed to our highly successful 119th year.

Gary L. Cunningham
Dean and Director

Federal Funding Prospects for FY '07

As many of you may be aware, the President's budget proposal for FY 2007 was made public in early February. The small portion of that huge budget that directly affects ARD is the research and education section of the proposed budget for USDA's Cooperative State Research, Education, and Extension Service. The news there, while not great, is good and very much better for us than it was this time last year in the FY 2006 proposal. Most significantly, Hatch and McIntire-Stennis formula funds are restored, but with slight decreases from FY-'06 appropriated levels. Unfortunately Animal Health formula funds were not restored in the budget proposal. However, as you may recall, Congress did appropriate a little over \$5 million in FY '06 for Animal Health formulas. It is likely they will do so again.

The President's budget proposes a significant increase over the FY '06-appropriated level for the National Research Initiative. A little over \$66 million would be added to the NRI. However, approximately \$42 million of that would come from the Section 406 integrated programs, which would be incorporated into the NRI by raising the portion of NRI funds that could be used for integrated projects to 30% of the total. This still results in approximately a \$24 million increase in CSREES competitive grant programs, an opportunity of which we should be able to take advantage.

Perhaps the most significant change proposed in the President's FY '07 budget for CSREES involves changes in the way Hatch and McIntire-Stennis funds are distributed to the agricultural experiment stations. Although the details are still to be worked out, the general plan is to convert, over the next five years, approximately half of these funds to competitive grants that would be awarded to groups of experiment stations to conduct longer-term, multistate research projects that address significant agricultural problems facing a region or segment of the industry. Should this change come about, we will need to work diligently to make sure any new way of doing business works to the advantage of Nebraska agriculture.

119th ARD Annual Report

The 119th Annual Report for the Agricultural Research Division was recently published. Although this report is required by legislation establishing the Nebraska Agricultural Experiment Station on March 31, 1887, it is published primarily as a means to communicate faculty research accomplishments to key decision makers. The publication also serves as an historical record of faculty accomplishments, active projects, faculty and graduate student recognition and outputs from the research program.

The annual report is sent to wide range of people including the Governor, members of the Nebraska Legislature, the Nebraska Congressional Delegation, University of Nebraska Board of Regents, NU and UNL administrators, state agency directors, USDA officials, ARS collaborators, experiment station directors in other states, and selected IANR clientele. This report may be accessed on the World Wide Web at: <http://www.ard.unl.edu/report.shtml>.

Endeavors

For a number of years, Vicki Miller has written and coordinated printing of Endeavors, the primary accomplishment reporting publication of the Agricultural Research Division. Endeavors provides short reports of significant findings from ARD faculty research projects. Each year, this eight-page document highlights the accomplishments of from 25 to 30 research projects. The 2005-2006 publication features a broad range of research topics from alternative crops to the impacts of consolidation in the food processing industry.

Endeavors is the principal publication provided to members of the Nebraska Legislature to report on the impacts of Nebraska's investment in agricultural research. Likewise, we use the publication in our meetings with the Nebraska Congressional Delegation and their staffs. It has also been used as the basis for discussions with IANR clientele and support groups. Copies are available for use by unit administrators and faculty in their meetings with unit external advisory committees or other clientele groups. Please contact the ARD office if you would like copies.

Mark Your Calendars

Mark your calendars for the upcoming IANR Liaison Committee's Spring Forum. The forum is entitled "The Institute in 2030". The forum is scheduled for Monday, April 3rd, from 1:30 to 3 p.m. and will be held in the East Campus Union. The Forum will be telecast to off-campus sites. Further announcements about presenters will be made as the date nears.

New or Revised Projects

November and December 2005

NEB 12-194 Novel methods for soybean genetic improvement and genomic analysis

Investigator: James Specht, Agronomy and Horticulture

Status: Grant project effective Dec. 1, 2005, through Nov. 30, 2010

NEB 14-141 Molecular genetic analysis of *Mycobacterium avium* subsp. *paratuberculosis* (MAP) and related mycobacterial pathogens

Investigator: Raul Barletta, Animal Science

Status: Grant project effective Oct. 1, 2005, through Sept. 30, 2010

NEB 40-043 Nebraska Landslides. A research project to locate, classify, inventory, study and publish on landslides in Nebraska

Investigator: Duane Eversoll, School of Natural Resources

Status: Grant project effective Oct. 1, 2005, through Sept. 30, 2010

Proposals Submitted for Federal Grants November and December 2005

The following is a listing of proposals that were submitted during November and December 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.

Robert Joeckel, Paul Hanson, and James Swinehart

– USGS – State map FY 2006 – \$80,247

David Carter, Thomas Powers, Rhae Drijber, and Leon Higley – National Institute of Justice – The development of belowground microbial and nematode community dynamics as a tool to estimate postmortem interval – \$272,336

Janos Zempleni – USDA – Biotin affects cytokine metabolism – \$409,586

Craig Allen, Andrew Tyre, and Qi (Steve) Hu – EPA – Interactions between climate change and multiple stressors: Predicting nonlinear changes in amphibian and aquatic macroinvertebrate assemblages – \$401,346

Raul Barletta and Oregon State University – NIH – *Mycobacterium avium* subsp. *Paratuberculosis* intestinal invasion – \$378,571

Susan Sheridan, Helen Raikes, Carolyn Pope Edwards, and Julia Torquati – US Department of Education – Center for Ecological Studies of early language and literacy – \$8,629,975

Soundararajan Madhavan, Timothy Arkebauer, Daniel Walters, Daniel Ginting, John Markwell, Donald Weeks, David Wedin, and Shashi B. Verma – NSF – Acquisition of a state of the art stable gas isotope ratio mass spectrometer with a dual inlet system and a microvolume capability, an elemental analysis – \$509,475

Geoffrey Henebry and Naikoa Aguilar-Amuchastegui – NSF – Using Changes in the spatial patterns of canopy

reflectance to target tropical forest stands for field surveys of indicators of ecological sustainability – \$10,540

Qi (Steve) Hu, Anatoly Gitelson, Donald Rundquist, Lisa Marie Pytlík Zillig, Roger Bruning, Kyle Hoagland, John Holz, Ken Hubbard, and Stephen Goddard – NASA – Integrating NASA satellite observations and OSSE products into decision-making tools for support of water managements and agricultural efficiency – \$871,535

Donald F. Becker, Robert Powers, Stephen Ragsdale, Julie Stone, Donald Weeks, and Mark Wilson – NSF – Acquisition of a Beckman XL-1 Analytical Ultracentrifuge – \$320,397

Janos Zemleni and Ashraf Raza – USDA-NRI – Histone biotinylation in chromatin during switchgrass seed germination – \$203,067

Vadim Gladyshev – NIH – Selenoproteins as targets for cancer prevention – \$1,581,530

Shashi B. Verma, Ken Cassman, Timothy Arkebauer, Achim Dobermann, Daniel Ginting, Ken Hubbard, Johannes Knops, Andrew Suyker, Daniel Walters, and Haishun Yang – US Department of Energy – Carbon sequestration in dryland and irrigated agroecosystems: quantification at different scales for improved prediction – \$1,200,000

Andrea S. Cupp – USDA-NRI – Role of VEGF isoforms in bovine follicle development – \$379,405

James B. Swinehart, Vitaly A. Zlotnik, and Sherilyn C. Fritz – NSF – Mechanisms producing salinity variations in lake salinity in dune environments: Nebraska Sand Hills – \$250,725

Ruma Banerjee – NIH – Regulation of homocysteine-dependent redox homeostasis – \$252,000

Chris R. Calkins – NRI – Off-flavor compounds in beef value cuts – \$299,366

Jeyamkondan Subbiah, Chris R. Calkins, and Ashok Samal – USDA-NRI – Hyperspectral imaging to predict beef tenderness – \$399,584

Clinton Jones – NRI – Functional analysis of proteins encoded by the bovine herpesvirus 1 latency related gene – \$374,475

Robert J. Wright and W. Wyatt Hoback of University of Nebraska-Kearney – USDA-APHIS – Grasshoppers of the Western United States: electronic identification and information tool development – \$25,907

Harshavardhan Thippareddi, David R. Smith, Andrew K. Benson, Catherine N. Cutter, Chitrita DebRoy, and Eva Wallner Pendleton – NRI – After the ban: changes in fluoroquinolone resistant campylobacter from organic and conventional poultry - a multi year, multi level study – \$1,199,975

Bruce E. Hibbard, John E. Foster, Louis S. Hesler, Jonathan J. Neal, and B. Wade French – NRI – Understanding corn rootworm-host interactions toward basic and applied goals – \$395,000

Shashi B. Verma – NASA – Land use, economy and climate in the Central Great Plains: impacts on the North American carbon cycle – \$150,000

Ji-Young Lee and Timothy Carr – NRI – Anti-atherogenic roles of nostoc commune, a blue-green alga – \$459,424

Gary Y. Yuen and Thomas O. Powers – NRICGP – Biological control of plant-parasitic nematodes with *Lysobacter* – \$188,660

Mary M. Beck – USDA-CSREES – Neural plasticity and behavior: a new approach to assessing hen welfare – \$348,694

Gary P. Rupp, D. Dee Griffin, John A. Schmitz, David Steffen, and Clayton Kelling – NRI – Developing a regionalized, state-based, herd-centered, voluntary bovine viral diarrhea virus (BVDV) control program in the USA – \$370,785

Ayse Irmak, Derrel Martin, Suat Irmak, George Meyer, Donald Rundquist, Shashi Verma, and Qi Hu – USGS, Department of Interior – Use of remotely sensed data for improved quantification of evapotranspiration for water management in Nebraska – \$20,000

Clayton L. Kelling, David J. Steffen, and Christina L. Topliff – NRI – Attenuated recombinant noncytopathic bovine viral diarrhea virus genotype 1 and 2 vaccine – \$350,564

Gary Y. Yuen, Steven D. Harris, and Liangcheng Du – NRI – Genetic and functional characterization of a novel antibiotic from the biocontrol agent *Lysobacter enzymogenes* C3 – \$401,960

Yiqi Yang and Narendra Reddy – USDA-DOE – Biofibers and biofuels from lignocellulosic agricultural byproducts – \$329,024

Timothy P. Carr, Ji-Young Lee, and Pat Dussault – USDA-NRI – Regulation of cholesterol absorption by plant sterol and stanol esters – \$478,499

Alexander Pavlista – CSREES – Development of multi-purpose potato cultivars with enhanced quality, disease and pest resistance - North Central Program – \$3,000

Kenneth G. Hubbard – NSF – Spatio-temporal variations in soil moisture and land memory processes in the Great Plains – \$107,491

Jozsef Szilagyi – NSF – Testing the impacts of river navigation engineering on flood levels through retro-modeling of the Lower-Missouri River, USA – \$68,385

Milford A. Hanna (subcontract with the University of Wisconsin) – NRI – Rheology, morphology and functional properties of starch-based biodegradable foams – \$163,900

Raul G. Barletta – NRI – Mycobacterium avium subsp. paratuberculosis pathogenesis – \$159,574

Geoffrey M. Henebry – NASA – Climate change for institutional change-on changes in land surface phenologies in Central and Northern Eurasia – \$24,000

Milford A. Hanna (subcontract with Mississippi State University) – NRI – Oxidatively and thermally stable polymerization resistant industrial lubricants from chemically modified soybean oil and its methyl esters – \$125,680

John Foster – USDA-ARS – Developing transgenic methods for use in studying screwworm genetics – \$9,000

Yiqi Yang, Narendra Reddy, and Ying Li – NRI – Cross-linked protein fibers from the processing byproducts of corn, wheat and soybeans – \$205,433

Milford A. Hanna and Mississippi State University – NRI – Oxidatively and thermally stable, polymerization resistant industrial lubricants from chemically modified soybean oil and its methyl esters – \$373,180

Steven Thomas – NSF – DEB ecosystems – \$354,289

Steven Harris – NSF – Regulation of formin function in filamentous fungi – \$525,102

Harshavardhan Thippareddi and Texas State University – National Integrated Food Safety Initiative – Development and implementation of voluntary HACCP in the feed industry: phase II – \$119,895

Milford A. Hanna, Yiqi Yang, and Yiziang Xu – NRI – Process development and characterization of starch-based nanocomposites with enhanced functional properties and biodegradability – \$274,360

Lijun Wang, Milford A. Hanna, and Curtis L. Weller – NRI – Investigation of an integrated fluidized bed gasifier and fuel cell system for combined heat and power generation from distillers grain in ethanol plants – \$329,150

Sally Mackenzie and Mike Fromm – NRI – Training graduate students in plant breeding using crop drought tolerance improvement as a model – \$600,000

Milford A. Hanna – NRI – Process development and characterization for highly substituted starch acetate – \$483,260

Janos Zempleni, Judith Christman, John West, and Bhavana Dave – NIH – Epigenetic effects of biotin on activation of endogenous viral sequences – \$401,500

Grants and Contracts Received for November and December 2005

Agricultural Economics:	
Bradley Lubben – Farm Foundation	\$42,600.00
Agronomy and Horticulture:	
Ken Cassman, Achim Dobermann, James Specht, Haishun Yang, and Daniel Walters – Nebraska Soybean Board	\$56,800.00
Achim Dobermann, James Specht, and Ken Cassman – Nebraska Soybean Board	\$28,755.00
Rhae Drijber – USDA-ARS	\$74,000.00
George Graef, James Specht, and Loren Giesler – Nebraska Soybean Board	\$43,666.00
George Graef and James Specht – Nebraska Soybean Board	\$39,500.00
George Graef and James Specht – Nebraska Soybean Board	\$147,360.00
Charles Wortmann, Galen Erickson, Dennis Schulte, Tom Franti, and Doug Jose – Nebraska Corn Board	\$235,839.00
Miscellaneous Grants under \$10,000	\$27,000.00
Animal Science:	
Miscellaneous Grants under \$10,000	\$5,000.00
Entomology:	
Thomas Hunt, Leon Higley, and William Kranz – Nebraska Soybean Board	\$29,583.00
Food Science and Technology:	
Stephen Taylor and Susan Hefle – DMS Nutritional Products AG	\$45,611.77
Stephen Taylor and Susan Hefle – Norland Products, Inc.	\$47,211.39
Miscellaneous Grants under \$10,000	\$6,115.00
Nutrition and Health Sciences:	
Miscellaneous Grants under \$10,000	\$5,000.00
Northeast Research and Extension Center:	
Miscellaneous Grants under \$10,000	\$12,500.00
Panhandle Research and Extension Center:	
Patrick E. Reece – Nebraska Game and Parks Commission	\$19,633.00
Miscellaneous Grants under \$10,000	\$22,600.00
Plant Pathology:	
Loren Giesler and Thomas Hunt – Nebraska Soybean Board	\$19,198.00
Loren Giesler and George Graef – Nebraska Soybean Board	\$40,150.00
James Van Etten and the University of California – NIH	\$144,293.00
Miscellaneous Grants under \$10,000	\$11,480.00
School of Natural Resources:	
Mark Burbach, Byrav Ramamurthy, and Cody Knutson – USDA-FCIC	\$403,293.00
Xun-Hong Chen and Mark E. Burbach – Upper Big Blue Natural Resources District	\$14,760.00
Miscellaneous Grants under \$10,000	\$6,000.00
Veterinary and Biomedical Sciences:	
Raul Barletta – USDA-BARD	\$143,000.00
Fernando A. Osorio and Asit Pattnaik – National Pork Board	\$150,000.00
David Steffen – Nebraska Game and Parks Commission	\$45,000.00
David Steffen – Nebraska Department of Agriculture, Bureau of Animal Industry	\$80,000.00
David Steffen – USDA	\$86,175.00
West Central Research and Extension Center:	
Rick Funston – Nebraska Soybean Board	\$22,612.00
Miscellaneous Grants under \$10,000	\$3,800.00
Total	\$2,058,535.16