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INSTITUTE OF AGRICULTURE AND NATURAL RESOURCES

Agricultural Research Division News

August 2006

Volume 39, Number 4

Comments from the Dean

Dear Colleagues,

Most experiment station directors who talk about the history and funding of agricultural research start with Justin Morrill in 1862, or Henry Hatch in 1887.

To talk about the history of agricultural research funding that provides context for the current debate over whether formula funds or competitive grants are most productive, I start in 1945, with Harley M. Kilgore and Vannevar Bush.

Senator Kilgore, whose rural farming and mining state of West Virginia was hit heavily by the Depression, was a New Deal democrat.

Bush, head of the wartime Office of Scientific Research and Development (OSRD), is known for fostering close collaboration between the OSRD and a few universities to pursue war-related research that produced radar, penicillin, computers, jet propulsion, atomic bombs and energy, and more.

The success of that collaboration makes it no surprise that after the war, political leaders agreed the government/university research partnership should continue. Bush proposed a National Science Foundation to provide funding for pure research based on competitive merit review of proposals, with the agenda set by the scientific community.

Senator Kilgore also wanted a federal government/university collaboration, but he wanted it to extend beyond a few elite institutions. He and congressional colleagues valued the land-grant system with its formula funds and a research agenda controlled at the local level, with research focused on local as well as national needs.

They sought results the states could use.

The battle between these two philosophies of funding appropriation waged in Congress for five years. In the end, Bush and the administration prevailed. In 1950 Harry Truman signed legislation establishing the National Science Foundation, with a focus on basic science and a competitive peer review system for awarding grants.

This diverse system of formula funds and competitive grants still exists today.

The 1950s saw little funding growth for research until Sputnik entered orbit and we began the race to the moon. The years 1960-1972 have been called U.S. science's Golden Age.

It was during the 1960s, when little growth in grant-funded research outside major elite universities was seen, that programs began to strengthen infrastructure for competitiveness among institutions.

Before the closing decade of the 20th century, it became clear that while formula-based federal funding and the increasing state match and over-match of these funds maintained our ability to conduct locally appropriate developmental and applications research, these funds could not adequately support the fundamental research necessary for major new breakthroughs in agricultural science.

Experiment station scientists turned more and more to the National Science Foundation, National Institutes of Health and other competitive programs for research funding, often to the detriment of more applied work.

The USDA National Research Initiative has, since the early 1990s, met some but not all of this need. The same can be said for formula funds as research expenses grow.

Both formula funds and competitive grants are necessary. As Senator Kilgore recognized in 1945, formula funds and competitive grants serve different needs, both of which are critical to a strong national research program to support agriculture, the environment and communities.

Studies by Iowa State University and Yale University show that over the past 30 years, while the annual rate of return for government bonds has been 3 percent above the inflation rate, and the S&P 500's average rate of return has been 8.5 percent, the annual rate of return to society for the benefits of publicly funded agricultural research has been approximately *50 percent.*

The economists looked at the return on taxpayer investments in agricultural research and development at the nation's land-grant universities and the U.S. Department of Agriculture. It's a tremendous return on investment.

Gary L. Cunningham
Dean and Director

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IANR

Hardin Distinguished Graduate Fellowship 2006-2007

The recipients of the Hardin Distinguished Graduate Fellowship for 2006-2007 are **Desalegn Debelo Serba** and **Tejinder Kumar Mall** from the Agronomy and Horticulture Department. This 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. They will receive a $2,000 supplement to their graduate assistantship and the Agronomy and Horticulture Department will receive $2,000 of operational support for their research programs.

Desalegn Debelo Serba is completing his Ph.D. dissertation involving "genetic linkage mapping and genetic basis of chinch bug resistance in diploid buffalograss". Desalegn is working with a diploid population derived from heterozygous parents. His research will set the framework for a genetic linkage map based on genome regions most responsible for the chinch bug resistance. Dr. Robert Shearman is his advisor.

Tejinder Kumar Mall is completing his Ph.D. dissertation dealing with "finding mechanisms controlling stress response in plants and to check their expression in sorghum". Tejinder works to qualify the variability of cold tolerance in commercial hybrid seed lots, inbred lines and large-seeded inbreds under growth chamber conditions and to study the molecular basis for cold tolerance using a genomic and proteomic analysis. Dr. Ismail Dweikat is his advisor.

Widaman Trust Distinguished Graduate Assistant Award 2006-2007

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 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% 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.

Name: Vikas Shedge
Thesis area: Plant Breeding/Genetics
Department: Agronomy/Horticulture
Advisor: Sally Mackenzie

Name: Ahmed Mohammed Al-Wadaey
Thesis area: Soil and Water Science
Department: Agronomy/Horticulture
Advisor: Charles Wortmann

Name: Nathan Mueller
Thesis area: Soil and Water Science
Department: Agronomy/Horticulture
Advisors: Martha Mamo and Daniel Ginting

Name: Ching-Yi Chen
Thesis area: Animal Breeding/Genetics
Department: Animal Science
Advisors: Dale Van Vleck and Rodger Johnson

Name: Mark Corrigan
Thesis area: Animal Science
Department: Animal Science
Advisors: Terry Klopfenstein and Galen Erickson

Name: Jeremy Martin
Thesis area: Bovine Reproduction Physiology
Department: Animal Science
Advisors: Rick Funston and Andrea Cupp

Name: Kara Niemeier
Thesis area: Environmental Engineering
Department: Biological Systems Engineering
Advisors: Richard Stowell and Dennis Schulte

Name: Nicholas Aliano
Thesis area: Entomology
Department: Entomology
Advisor: Marion Ellis

Name: Yousef Hassan
Thesis area: Nutrition
Department: Nutrition and Health Sciences
Advisor: Janos Jempleni

Name: Heather Rasmussen
Thesis area: Interdepartmental Nutrition
Department: Nutrition and Health Sciences
Advisor: Ji-Young Lee

Name: Shakho N. Yarbayeva
Thesis area: Nutrition Biochemistry
Department: Nutrition and Health Sciences
Advisor: Julie Albrecht

Name: Charles Frost
Thesis area: Wildlife Ecology
Department: School of Natural Resources
Advisor: Scott Hygnstrom

Name: Wesley Moses
Thesis area: Natural Resources
Department: School of Natural Resources
Advisor: Anatoly Gitelson

Name: David Karst
Thesis area: Human Sciences
Department: Textiles, Clothing and Design
Advisor: Yiqi Yang

Name: Joseph Erume
Thesis area: IBMS
Department: Veterinary and Biomedical Sciences
Advisor: Rodney Moxley

John and Louise Skala Fellowship 2006-2007

The John and Louise Skala Fellowship was established at the NU Foundation. Fifty percent (50%) of the net income of this Fund shall be used annually or otherwise for one or more fellowships to full-time graduate students in the UNL Institute of Agriculture and Natural Resources (IANR). The recipient of this fellowship shall be engaged in research in areas relating to the new industrial uses of agricultural products. This fellowship provides a $3,000 stipend to master's students and a $5,000 stipend to doctoral students.

Five students are the recipients of these awards through the Agricultural Research Division and the College of Agricultural Sciences and Natural Resources:

Name: Zachary Hall
Thesis area: Ruminant Nutrition
Department: Animal Science
Advisor: Rick Rasby

Name: Ajay Kumar
Thesis area: Agriculture and Biological Engineering
Department: Biological Systems Engineering
Advisor: Milford Hanna

Name: Heartwin Pushpadass
Thesis area: Agriculture and Biological Engineering
Department: Biological Systems Engineering
Advisor: Milford Hanna

Name: Govindarajan Suresh Babu
Thesis area: Agriculture and Biological Engineering
Department: Biological Systems Engineering
Advisor: Milford Hanna

Name: Carolina Leguizamon
Thesis area: Food Science and Technology
Department: Food Science and Technology
Advisor: Curtis Weller

Shear-Miles Fellowship 2006-2007

The Shear-Miles Agricultural Scholarship and Fellowship was established at the NU Foundation with a $173,000 gift from the estate of Dorothy S. Miles. James Dennis, executor of the Miles Estate, said Dorothy Miles planned that the gift memorialize her father and father-in-law, Corneilus Lott Shear and George Miles. Shear and Miles both graduated from the College of Agriculture at the University of Nebraska. Shear received his bachelor's and master's degrees in 1887 and 1901 and Miles graduated in 1903. This endowed fund provides scholarships and fellowships to benefit the Agricultural Research Division and the College of Agricultural Sciences and Natural Resources.

Three students will be recipients of this $2,000 award given by ARD:

Name: Ajay Sandhu
Thesis area: Plant Breeding and Genetics
Department: Agronomy and Horticulture
Advisor: Sally Mackenzie

Name: Jennifer McDonald
Thesis area: Animal Breeding and Genetics
Department: Animal Science
Advisor: Rodger Johnson

Name: Gustavo Bretschneider
Thesis area: Infectious and Immune Response
Department: Veterinary and Biomedical Sciences
Advisor: Rod Moxley

Al Moseman International Studies Fund 2006-2007

The "Al Moseman International Studies Fund" was established through a trust in the University of Nebraska Foundation. This fund supports students with the potential to contribute to international development. The U.S. role in technical assistance in future international agricultural development programs requires leadership in identifying and creating initiatives to achieve cooperation among multi-disciplinary team members and to surmount traditional precedents in host country scientific and administrative procedures. This award is designated for graduate students in the Agronomy Graduate Program with interests in international agriculture and world food development. Preference will be given to students who are working in plant breeding and genetics.

The student listed below is the recipient of this $2,500 award through the Agricultural Research Division and the College of Agricultural Sciences and Natural Resources:

Name: Neway Mengistu
Thesis area: Plant Breeding and Genetics
Department: Agronomy and Horticulture
Advisor: Stephen Baenziger

New or Revised Projects May and June 2006

NEB 26-179 NC 1131, Molecular mechanisms regulating skeletal muscle growth and differentiation
Investigator: Steven Jones, Animal Science
Status: Multistate project effective June 1, 2006, through Sept. 30, 2010

NEB 30-110 Inorganic carbon transporters and photosynthetic efficiency
Investigator: Donald Weeks, Biochemistry
Status: Hatch project effective July 1, 2006 through June 30, 2011

NEB 41-032 NC 205, Ecology and management of European Corn Borer and other lepidopteran pests of corn
Investigator: Tom Hunt, Northeast Research and Extension Center
Status: Multistate project effective Oct. 1, 2005 through Sept. 30, 2010

NEB 42-100 NC 1006, Methods to increase reproductive efficiency in cattle
Investigator: Rick Funston, West Central Research and Extension Center
Status: Multistate project effective June 1, 2006 through Sept. 30, 2007

Proposals Submitted for Federal Grants May and June 2006

The following is a listing of proposals that were submitted during May and June 2006 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.

David Gosselin — Nebraska Department of Health and Human Services — Evaluation of geologic rehabilitation of public water supply wells having high arsenic and uranium — $62,335

Raul Barletta — NRI — Johne's disease integrated program for research, education and extension — $57,363

James Steadman — USDA-ARS — A search for genetic resistance to the rust and web blight pathogens in wild and landrace Andean and Middle American beans collected from areas of host-pathogen — $16,000

John Holz, Elaine Nowick, Donna Fleming, and Margaret Mering — NSF — Water education pathway — $397,144

Janos Zempleni — NIH — Biotin sensing and chromatin remodeling by holocarboxylase synthetase — $1,168,000

Loren Giesler — National Legume Risk Management Tool Development — USDA CSREES sentinel plot monitoring program for Nebraska — $18,828

Ruma Banerjee — NIH — Redox Biotechnology research training program — $1,567,193

Gary Hein, Drew Lyon, and Paul Burgener — USDA-ARS — Areawide IPM of the Russian Wheat Aphid and Greenbug: Colorado — $63,104

David Gosselin, Karina Schoengold, Wayne Woldt, Randolph Cantrell, Alan Tompkins, and Paul Blum — EPA — Sustainable rural communities through adaptive management of water supply infrastructure — $294,039

Loren Giesler — NCSRP-USDA — Fungicide management of soybean rust — $15,000

Tom Clemente — NRI — Displacement of fishmeal by novel soybean germplasm in aquaculture feed — $333,031

Gary Cunningham — USDA-ARS — Research to improve production efficiency/meat quality, reduce food safety pathogens, and minimize impact of animal agriculture on environment — $946,600

James Merchant, Milda Vaitkus, and Don Rundquist — U.S. Geological Survey — State view program development and operations for State of Nebraska — $83,999

Terry Mader, Q. Steven Hu, and Rick Rasby — Department of Energy — Evaluating models predicting livestock output due to climate change — $314,341

Asit Pattnaik, Subash Das, and You Zhou — NIH — Replication and assembly of vesicular stomatitis virus — $1,945,346

Wayne Woldt and Xun-Hong Chen — NSF — Development of pilot national center for hydrologic synthesis and applications — $710,329

Yiqi Yang — USDA-IMBA — Poly(carboxylic acid) cross-linking of starch as an alternative to starch acetate for fibers and extrudates — $170,699

James Specht — USDA-ARS — Drought stress tolerance in Nebraska — $66,000

Gary Hergert, Paul Burgener, Derrel Martin, Raymond Supalla, Drew Lyon, Dean Yonts, Alex Pavlista, and David Baltensperger — USDA-FCIC — Enhancing irrigation management tools and developing a decision support system for managing limited irrigation supplies for the High Plains — $785,532

James Van Etten — NIH — DNA replication and gene expression of chlorella viruses — $1,255,600

Martha Mamo and Daniel Ginting — NRI — Flux, fate and transport of greenhouse gasses along hydrologic flow path in agricultural watershed — $489,444

Brett White — USDA-CSREES — Activin responsiveness of the porcine GnRH receptor gene: genotype to phenotype — $449,743

Stephen Danielson — SARE — On-farm experiential research: evaluating multiscale relationships between non-crop habitats and the abundance of key natural enemies on organic farm — $149,928

Paul Kononoff — NRI — Development of bioequivalent and sustainable dairy rations containing corn milling co-products — $324,396

Mark Svoboda, Brian Wardlow, and Tsegaye Tadesse — USGS — Incorporating remote sensing information into the U.S. Drought Monitor — $152,608

David O. Carter and Rhae Drijber — Forensic Sciences Foundation — Estimation of postmortem interval using fatty acid methyl esters and lipid phosphate in soil associated with cadaver decomposition — $1,000

Gary Hergert — SARE — Limited irrigation cropping systems to sustain ground water in the High Plains — $137,540

James Steadman — USDA-ARS — Resistance improvement of bean through multi-site screening and pathogen characterization — $60,875

Grants and Contracts Received for May and June 2006

Agricultural Economics:
Miscellaneous Grants under $10,000 each $12,949.00

Agricultural Research and Development Center:
Dan Duncan — Barta Brothers Fund $20,000.00

Agronomy and Horticulture:
Stephen Baenziger — USDA-ARS-NPS $42,072.00
Ken Cassman, Terry Klopfenstein, Haishun Yang, Dan Walters, Charles Wortmann, and Galen Erickson — Nebraska Energy Office $67,500.00
Ismail Dweikat — Anna Elliott Fund $15,000.00
James Specht — USDA-ARS $66,000.00
Miscellaneous Grants under $10,000 each $112,895.00

Animal Science:
Chris Calkins — Nebraska Cattle Industry Fund $10,000.00
Chris Calkins — National Cattlemen's Beef Association $32,328.00
Galen Erickson and Terry Klopfenstein — Golden Harvest $32,200.00
Steve Jones — National Cattlemen's Beef Association $10,500.00
Miscellaneous Grants under $10,000 each $10,250.00

Biochemistry:
Stephen Ragsdale — Department of Energy $140,000.00
Melanie Simpson — NIH $100,000.00
Robert Spreitzer — U.S. Department of Energy $130,000.00

Biological Systems Engineering:
Ayse Irmak — Anna Elliott Fund $15,000.00
Suat Irmak — Layman Fund $10,000.00
Suat Irmak — Burlington Northern Endowment $25,000.00
Darrell Martin — Bureau of Reclamation $144,000.00

Entomology:
Lance Meinke — Monsanto Company $22,680.00
Lance Meinke — Syngenta Seeds Inc. $15,120.00
Blair Siegfried — Agrigenetics $23,535.00
Blair Siegfried and North Carolina State University — NSF $19,500.00
Blair Siegfried — USAID $84,023.00
Robert Wright — Syngenta Seeds, Inc. $15,120.00
Miscellaneous Grants under $10,000 each $3,100.00

Food Science and Technology:
Andrew K. Benson — The Biobalance Corporation $85,730.00
Miscellaneous Grants under $10,000 each $5,010.00

Industrial Agricultural Products Center:
Milford Hanna and Loren Isom — Nebraska Corn Board $29,558.00
Milford Hanna and Loren Isom — Nebraska Soybean Board $30,000.00

Northeast Research and Extension Center:
Miscellaneous Grants under $10,000 each $33,100.00

Panhandle Research and Extension Center:
Gary Hein, Stephen Wegulo, Qi Steven Hu, and Donald Rundquist — CSREES-N C IPM $89,622.00
Gary Hein, Drew Lyon, and Paul Burgener — USDA-ARS $38,129.00
Gary Hein — Monsanto Company $11,340.00
Miscellaneous Grants under $10,000 each $88,400.00

Plant Pathology:
Tamra Jackson — Layman Fund $9,840.00
Jim Steadman — Anna Elliott Fund $15,000.00
Miscellaneous Grants under $10,000 each $69,540.00

School of Natural Resources:
Craig R. Allen and James Merchant — Nebraska Environmental Trust $110,060.00
Xun-Hong Chen and Scott Summerside — Upper Big Blue Natural Resources District $16,000.00
Steve Comfort — PNNL/Battelle Memorial Institute $60,000.00
Anatoly Gitelson — NASA $211,723.00
David Gosselin — Nebraska Department of Health and Human Services $62,335.00
Paul Hanson — U.S. Geological Survey $56,378.00
Paul Hanson — Layman Fund $10,000.00
Kyle Hoagland — National Park Service $20,078.00
Aris Holz — Layman Fund $9,982.00
John Holz and Tadd Barrow — Nebraska Department of Environmental Quality $26,088.00
Mark Pegg — Layman Fund $9,490.00

Larkin Powell — Platte River Whooping Crane Maintenance Trust	$149,857.00
Venkataramana Sridhar — Agricultural and Water Research Endowment	$12,740.00
David Wedin and Kimberly Payne — U.S. EPA	$17,344.00
Miscellaneous Grants under $10,000 each	$18,982.00
Statistics:	
Erin Blankenship and Walter Stroup — Boehringer Ingelheim Pharmaceuticals	$38,731.00
David Marx — USDA-ARS	$20,000.00
Miscellaneous Grants under $10,000 each	$7,230.00
Veterinary and Biomedical Sciences:	
Raul Barletta — National Institue of Allergy and Infectious Disease	$16,549.00
Raul Barletta — NRI	$57,363.00
David Steffen — Nebraska Department of Agriculture	$20,000.00
Miscellaneous Grants under $10,000 each	$200.00
Water Center:	
Kyle Hoagland — Nebraska Department of Roads	$31,923.00
West Central Research and Extension Center:	
Miscellaneous Grants under $10,000 each	$23,618.00
TOTAL	**$2,690,712.00**

New Satellite Image Crop Maps Available for Nebraska

The U.S. Department of Agriculture's National Agricultural Statistics Service (NASS) has released satellite image maps depicting crop patterns for 2005. These images, referred to as the Cropland Data Layer, can be used in geographic information system (GIS) applications.

Crop maps are available for the Midwestern States (IL, IN, IA, NE, ND, WI), Mississippi Delta Region (AR, LA, MO, MS), and Idaho. When the satellite image maps are used in a GIS and combined with other data layers such as soil, transportation networks, or weather contours, they can be helpful in watershed analysis, soils utilization over large areas, and crop rotation analysis.

A CD-ROM is available for each region for $50. No individually reported data from any farm is included or derivable from the CD-ROM. This aligns with NASS policy to strictly protect the confidentiality of farmer reported data.

To order, visit the NASS Web site at htttp://www.nass.usda.gov/research/Cropland/SARS1a.htm and click Order forms or Now Available CD-ROM and/or DVD. For additional information, call USDA's National Agricultural Statistics Service Nebraska Field Office at 1-800-582-6443.