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ARD News June 2004

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Comments from the Dean

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Dear Colleagues:

At the end of the academic year, it is appropriate to review what has occurred in the past 12 months. As the deans completed their reviews of Annual Reports of Faculty Accomplishments and requests of promotion in rank and award of tenure, we were reminded again of the high quality of our faculty and the contributions that they are making to educate learners, solve clientele problems and add to the storehouse of knowledge in many academic fields. Vice Chancellor Owens and the IANR deans were delighted to recommend the following ARD faculty for promotion to the rank of Professor: Timothy Arkebauer, Raul Barletta, Steve Comfort, Achim Dobermann, Dillon Feuz, Susan Fritz, Vadim Gladyshev, David Jones and Karl Reinhard.

ARD faculty promoted to Associate Professor and receiving tenure were: Thomas Hunt, Scott Josiah and Stevan Knezevic. In addition, Richard Bischoff received tenure, and Steve Sibray and Bruce Brodersen were promoted to Geoscientist and Research Associate Professor, respectively.

We were delighted to hear that James Specht was selected to receive a Bessey Professorship. Chris Calkins and Steve Jones received the 2004 International Meat Secretariat Prize for Meat Science and Technology. Ken Cassman received the International Crop Nutrition Award from the International Fertilizer Industry Association. Sally Mackenzie was designated a Fellow by the American Association for the Advancement of Science. Many other faculty received awards from their professional societies or were designated as Fellows of these organizations. Congratulations to all ARD faculty who were recognized during the past year.

Acquisition of grant and contract income continued at a high level. Although we will not know the total for FY 2004 until late July, it appears that ARD faculty will

have obtained more than the \$31.6 million received in FY 2003.

Our unit administrators exhibited excellent leadership during the past year. Thanks go to Richard Clark and Derrel Martin for serving as interim heads for the Departments of Agricultural Economics and Biological Systems Engineering, respectively. Our deepest appreciation goes to Ken Cassman and Jack Schmitz for many years of service as heads of the Departments of Agronomy and Horticulture and Veterinary and Biomedical Sciences, respectively. Both Ken and Jack have announced their return to a faculty role, and their leadership and vision will be greatly missed within IANR.

Darrell W. Nelson
Dean and Director

ARD Advisory Council Report

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The major issues addressed by the ARD Advisory Council this past year included policies for field production of unapproved transgenic crops, procedures for administering multistate research projects, civil rights compliance, quality indicators, electronic publishing and the IANR Web page. Council members were informed of developments in these areas and were given the opportunity to dialog with ARD administrators and other responsible parties regarding related policies and strategies.

A major highlight of this year was ARD Council sponsorship of a faculty forum with Vice Chancellor Prem Paul. This forum provided an opportunity to address issues related to policies and programs that were associated with UNL's aggressive pursuit of grant funding and research excellence. Faculty questions and comments at the forum reflected concerns about the impact of pressures to increase grant funding on ARD's research agenda, the effect of changes in

indirect cost recovery policies on UNL's ability to secure industry grants, requirements and funding for human subject and animal rights accreditation, and graduate student recruiting. The dialog was productive and anecdotal evidence suggests that most participants left feeling better informed and more optimistic about the future.

A final activity was revision of the ARD Advisory Council by-laws to reflect changes in unit names and in the distribution of faculty across units. The major change was to combine Animal Science and Biological Systems Engineering into one district and place the Northeast Research and Extension Center in a district with the West Central and Panhandle Research and Extension Centers.

The Council continues to provide faculty and administrators with a useful and productive opportunity to dialog about emerging research policies and programs that affect us all. All faculty are encouraged to share their related questions, concerns and suggestions with their council representatives.

*Ray Supalla, chair
ARD Advisory Council*

The GMO Food Debate

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We are all aware of the difference of opinion regarding introduction of genetically modified plants and animals into the human food chain. A recent article in *Issues in Science and Technology** did an excellent job of putting the controversy into perspective. Here are excerpts from the article:

"Biotech advocates typically cast the debate as about the safety of eating GM food and the possible ecological damage from growing it. They present the situation as a drama of knowledge battling against fear of the unknown. The fears of biotech critics, though, are about the social, political, economic and cultural effects of biotechnology on global agriculture. The leading critics of biotechnology — the ETC Group, Genetic Resources Action International, Third World Network, Institute for Agriculture and Trade Policy, Oxfam, and others — are concerned about Third World poverty, globalization, economic justice and many other social issues. To these critics, the biotech debate is not about the health effects of GM food but about control of the food supply. Their fears are not about the unknown but of the too well known: the concentration of industry power."

"When biotech advocates recognize the social, economic and political concerns of critics at all, they treat them as generic grievances against industrial agriculture of globalization, unconnected to biotechnology. But the crucial link that connects them is intellectual property rights, particularly patents on plants. It is because

industrialized countries have elected to consider GM plants patentable that biotechnology threatens to take control of the food supply out of the public domain and hand it to multinational corporations."

"It is important to be clear that the critics are not opposed to biotechnology itself. This is one of the points most often misunderstood. Nor are they opposed to patents themselves. They are opposed to the patenting of plants, which biotechnology makes possible. They consider this new expansion to be an ill-conceived transfer of the raw materials of food production from the public domain to private control."

* Crayford, Jerry. 2004. Breeding Sanity into the GM Food Debate. *Issues in Science and Technology*. XX:49-56. (Published by the National Academies and the University of Texas at Dallas).

Corn Facts

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In 2003, Nebraska produced 1.124 billion bushels of corn on 7.7 million harvested acres. The average yield was 146 bushels per acre. Nebraska ranked third in bushels of corn produced after Iowa and Illinois. Nebraska farmers grew about 11.1 percent of all corn grain produced in the United States in 2003. The national corn crop was 10.113 billion bushels with a value of \$23.3 billion.

The United States corn crop is utilized as follows: feed, 57 percent; export, 19 percent; fuel ethanol, 11 percent; high fructose corn syrup, 5 percent; starch, 2.5 percent; sweeteners, 2.2 percent; cereal, 1.8 percent; alcohol, 1.3 percent; seed, 0.2 percent.

One bushel of corn provides 31.5 pounds of starch or 33 pounds of sweetener or 2.5 gallons of fuel ethanol plus 13.5 pounds of gluten feed (20 percent protein); 2.6 pounds of gluten meal (60 percent protein); and 1.5 pounds of corn oil.

In 2003, the United States had 64 percent of world corn exports, which totaled 3 billion bushels. Other major corn exporting countries were Argentina, 12 percent; China, 10 percent and Brazil, 7 percent of total. Major importers of United States corn are Japan, Mexico, Taiwan, Egypt and Canada. In addition, the United States exported the equivalent of 365 million bushels of corn in the form of red meat.

Richard Ferguson Selected for Leadership Development Course

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Richard Ferguson, professor of Agronomy and Horticulture, has been selected to participate in the 2004-2005 ESCOP/ACOP Leadership Development Program. Ferguson will complete a three-phase program that features a week-long "introduction to leadership" workshop in Indianapolis; an administrative internship from July 1, 2004 to June 30, 2005; and a

capstone seminar with federal agency leaders, lobbyists and Congressional staff personnel in Washington, DC.

While serving as an intern, Ferguson will participate in ARD staff meetings, lead project reviews, undertake special projects, interview senior administrators and study research administration. We are pleased that Richard will be spending 10 percent of his time in intern activities during the next year in the Agricultural Research Division's office.

Nominations Sought for Junior Faculty Excellence in Research Award

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The Agricultural Research Division is seeking nominations for the Junior Faculty Excellence in Research Award. Given to 35 individuals since 1991, this award is designed to acknowledge outstanding research activity by tenure-track ARD faculty with service of five years or less.

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

The deadline for submission of nominations is **July 26, 2004**. Additional information can be obtained from unit administrators or by contacting Dora Dill at 472-7082.

Undergraduate Honors Research Program

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Funds for the FY 2004-2005 Undergraduate Honors Student Research Program have been allocated to units for support of undergraduate 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. Fourteen proposals were received and five were funded. The following students have received funding:

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|--|---------|
| Melissa Senf (Animal Science Department) | \$2,500 |
| Mentor: Mary Beck | |
| "Analysis of Behavior of Squirrel Monkeys in Single vs Mixed Species Exhibits at Henry Doorly Zoo" | |
| Ryan Pekarek (Agronomy and Horticulture Department) | \$2,500 |
| Mentor: Paul Read | |
| "A Study in the Ability of Forcing Technology to Disinfect <i>Corylus spp.</i> Hybrid Explants" | |

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|---|---------|
| Natalie C. Hart (Biochemistry Department) | \$2,500 |
| Mentor: Andrea Cupp | |
| "The Effects of Overexpression and Degradation of Hyaluronan on Follicular and Vascular Development in the Perinatal Rat Ovarian Model" | |

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|---|---------|
| Hahura Ahmad (Biological Systems Engineering) | \$2,500 |
| Mentor: Greg Bashford | |
| "Acoustic Coupling Media for Ultrasonic Investigation of Teeth" | |

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|--|---------|
| Holly Samson (Veterinary and Biomedical Sciences) | \$2,500 |
| Mentor: Clinton Jones | |
| "Influence of N-Linked Glycans on Bovine Respiratory Syncytial Virus Attachment (G) Glycoprotein Expression" | |

Channing B. and Katherine W. Baker Fund

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A trust established by Charles E. Baker was liquidated and an endowment was established at the University of Nebraska Foundation. The interest from the endowment is used to support one graduate research assistantship (GRA) in the areas of: (i) soil conservation and management, or (ii) breeding and genetics of food and feed grains, including germplasm and cultivar development.

A graduate student working on a M.S. degree can hold a GRA for up to two years, whereas a student enrolled in a Ph.D. program can receive funds for up to three years. Preference in awarding the GRA will be given to Ph.D. students. Funding will be limited to a maximum of \$12,000. Two proposals were awarded to:

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|---|----------|
| Ismail Dweikat (Agronomy and Horticulture) | \$12,000 |
| "Identification and Mapping of DNA markers linked to Cold Tolerance in Sorghum" | |
| Charles Wortmann (Agronomy and Horticulture) | \$12,000 |
| "Improving No-till Row Crop System" | |

ARD Interdisciplinary Research Grants Program

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Eighteen proposals were submitted to the ARD Interdisciplinary Research Grants Program and four proposals were selected for 2004-2005 funding. We also were able to fund one continuation project. New ARD Interdisciplinary Research Grants were awarded as follows:

- Paul Read**, Agronomy and Horticulture Department [Fred Baxendale, Entomology; James Hruskoci, Extension Educator/Hall County; Jeff Peake, Geography/

Geology; B. Ramamurthy, Computer Science/Engineering; James Schild, Panhandle Research and Extension Center; John Watkins, Plant Pathology; Bill Zanner, School of Natural Resources]

"A Phenological Network for Ecological Viticulture"

Total Amount Received: \$20,000

Funding Period: July 1, 2004 — June 30, 2005

Pat Reece, Panhandle Research and Extension Center/ Agronomy and Horticulture

[Ron Johnson, School of Natural Resources; Drew Tyre, School of Natural Resources; Erin Blankenship, Statistics; Ann Koehler, Panhandle Research and Extension Center, and Nebraska Game and Parks]

"Interaction Among Life-forms in Secondary Succession on Restored Wetlands"

Total Amount Received: \$20,000

Funding Period: July 1, 2004 — June 30, 2005

Jim Steadman, Plant Pathology Department [Don Rundquist, CALMIT; Anatoly Gitelson, CALMIT; Geoffrey Henebry, CALMIT; Roy French, Plant Pathology; Seven Hu, School of Natural Resources; Dale Lindgren, Agronomy and Horticulture/West Central Research and Extension Center]

"Evaluating Airborne Remote Sensing and the Advanced Vegetation Index Suite (AVIS) for Crop Disease Detecting and Monitoring: The Case of Dry Bean Rust"

Total Amount Received: \$19,750

Funding Period: July 1, 2004 — June 30, 2005

Tala Awada, School of Natural Resources [Amalia Yiannaka, Agricultural Economics; Edwin Harvey, School of Natural Resources; Xinhua Zhou, School of Natural Resources; Walter Schacht, Agronomy and Horticulture; Scott Josiah, School of Natural Resources]

"Woody Species Expansion in the Nebraska Sandhills: Ecological and Social-Economic Consequences"

Total Amount Received: \$20,000

Funding Period: July 1, 2004 — June 30, 2005

This continuing project has been evaluated and will continue for 2004-2005:

Andrea Cupp, Animal Science Department [Melanie Simpson, Biochemistry]

"Role of Hyaluronan During the Ovulatory Process in the Beef Cow"

Total Amount Received: \$20,000

Funding Period: July 1, 2004 — June 30, 2005

Proposals Submitted for Federal Grants

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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 the faculty members' outstanding efforts in submitting proposals to the various agencies.

James Specht — USDA/ARS — Characterization of Drought in Nebraska — \$36,968

Ismail Dweikat — INTSORMIL — Strategies to Enhance the Nutritional Quality of Grain Sorghum — \$67,397

James Specht — USDA/ARS — Genetic Mapping and Application of SNP DNA Markers in Soybean — \$38,198

Thomas E. Clemente — USDOE — Research in Nebraska on Improved Soybean Oil for Biodiesel Fuel — \$612,813

Thomas E. Clemente — NSF through University of Minnesota — VCA-PGR, *Triticeae-fusarium graminearum* Network for Plant Response to Fungal Pathogenesis — \$296,629

Anne M. Vidaver — USDA/ARS — Molecular Characterization of *Clavibacter iranicum* — and Related Species — \$25,565

Kenneth Hubbard and Stephen Goddard — NSF — A Distributed Database of *in situ*, Remotely Sensed and Modeled Climate Data for Decision Makers — \$668,405

Michael Hayes, Donald Wilhite and Kenneth Hubbard — USGS — Drought Monitoring Through the Integration of Climate and Satellite-based Data — \$73,805

Daniel Snow, David Tarkalson and Joe Payero — USDA/NRI through The State University of New York at Buffalo — Environmental Fate of Tetracycline Residues in Land-applied Manure and their Impact on Soil Microbial Ecology — \$299,486

James Brandle — USDA/NRI through Iowa State University — A Shelterbelt Planning Tool for the Mid-western United States — \$259,705

H.S. Yang, Achim Dobermann, Kenneth Cassman and Shashi Verma — USDA/NRI — Enhancing the Sensitivity of Agroecosystem Models to Climate Variability — \$457,196

Roy F. Spalding, Rhae E. Drijber, Wayne Woldt, Derrel Martin, Imtiyaz A. Khan and Jeannette A. Thurston-Enriquez — USDA/CSREES — Microbial Assessment of *in situ* Denitrification — \$549,834

William F. Wilcke — USDA/Special — North Central Region Sustainable Agriculture Research and Education Program — \$2,721,126

Suat Irmak, Derrel Martin, Terry A. Howell, Jose O. Payero and Richard B. Ferguson — USDA/CSREES — Precision Weighing Lysimeters, Bowen Ratio Energy Balance System and Eddy Correlation System for Improved Measurement and Prediction of Evapotranspiration for Agricultural Water Management in the Central Plains — \$599,860

Yan Xia, Kathy Bosch, Gina Kunz and Susan Sheridan — Center for Disease Control — Risk and Resiliency for Adolescent Dating Perpetration — \$899,190

New or Revised Projects

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

NEB-10-138 (Agricultural Economics) Measurement of Competitiveness of U.S. Beef, Soybean, Wheat, and Corn Production

Investigator: L.E. Fulginiti

Status: Revised Hatch project effective May 1, 2004

NEB-10-152 (Agricultural Economics) Strategic Behavior and Optimal Regulation in Industrialized Agricultural Markets: Patents, Biotechnology and Organic Agriculture

Investigator: A. Yiannaka

Status: New Hatch project effective November 1, 2003

NEB-10-153 (Agricultural Economics) Analysis of Agricultural Real Estate Market Dynamics in Nebraska

Investigator: B.B. Johnson

Status: New Hatch project effective March 1, 2004

NEB-12-304 (Agronomy and Horticulture) Development of a Transformation System for Sorghum (*Sorghum Bicolor* L.)

Investigator(s): I. Dweikat and T. Clemente

Status: New Hatch project effective February 1, 2004

NEB-13-162 (Animal Science) Genetic and Functional Genomic Approaches to Improve Production and Quality of Pork

Investigator(s): R.K. Johnson, D. Pomp and J. Weber

Status: New Hatch project effective October 1, 2002, that contributes to Regional Research project NC-1004

NEB-13-167 (Animal Science) A Genetic Approach to Uncovering Mammalian Genes Important in Sepsis Induced Multiple Organ Failure

Investigator: J.S. Weber

Status: New Hatch project effective May 1, 2004

NEB-14-131 (Veterinary and Biomedical Sciences) Veterinary Field Disease Research Program

Investigator: D.R. Smith

Status: New State project effective May 1, 2004

NEB-15-103 (Biochemistry) Biochemistry and Anaerobic CO₂ Fixation and Chlorophenol Metabolism

Investigator: S.W. Ragsdale

Status: New Hatch project effective March 1, 2004

NEB-15-104 (Biochemistry) Regulation of the Multifunctional Proline Utilization A (PutA) Flavoprotein and Proline Metabolism in Bacteria

Investigator: D.F. Becker

Status: New Hatch project effective April 1, 2004

NEB-15-105 (Biochemistry) Directed Evolution of Plant Formate Dehydrogenase

Investigator: J.P. Markwell

Status: New Hatch project effective April 1, 2004

NEB-15-106 (Biochemistry) Role of Hyaluronan Matrix in Prostate Cancer Progression

Investigator: M.A. Simpson

Status: New State project effective April 1, 2004

NEB-16-102 (Food Science and Technology) Development of Predictive Models for the Growth of Foodborne Pathogens in Meat and Poultry Products

Investigator: H. Thippareddi

Status: New Hatch project effective April 1, 2004

NEB-21-090 (Plant Pathology) Genetic Variability in the Cyst and Root-Knot Nematodes

Investigator: T.O. Powers

Status: New Hatch project effective October 1, 2003, that contributes to Regional Research project W-1186

NEB-21-091 (Plant Pathology) Characterization of Large Algal Viruses and Their Genes

Investigator: J.L. VanEtten

Status: New Hatch project effective May 1, 2004

NEB-23-003 (Statistics) Stress Factors of Farm Animals and Their Effects on Performance

Investigator: A.M. Parkhurst

Status: New Hatch project effective October 1, 2001 that contributes to Regional Research project W-173

NEB-32-012 (Director's Office) North Central Region Sustainable Agriculture Research and Education Program

Investigator: W.F. Wilcke

Status: New Cooperative Agreement effective July 1, 2004

NEB-34-001 (Center for Biotechnology) Mechanisms of Plant Cell Signaling

Investigator: M.E. Fromm

Status: New Hatch project effective September 1, 2003

NEB-40-002 (School of Natural Resources) Remediating Organic Contaminants in Soil and Water Through Natural and Accelerated Destruction

Investigator: S.D. Comfort

Status: Revised Hatch project effective February 1, 2004

NEB-40-028 (School of Natural Resources) Improving the simulation of winter wheat (*Triticum aestivum* L.) Responses to the Environment

Investigator: A. Weiss

Status: New Hatch project effective January 1, 2004

NEB-43-066 (West Central Research and Extension Center) Selection, Development and Propagation of Native Herbaceous Landscape Plants

Investigator: D.T. Lindgren

Status: Revised Hatch project effective May 1, 2004

NEB-43-075 (Panhandle Research and Extension Center) Genetic Variability of Field Populations of Wheat Curl Mite and the Impact of Virus Epidemiology

Investigator: G.L. Hein

Status: New Special Grant effective June 1, 2004

NEB-44-065 (Panhandle Research and Extension Center) Conservation, Management, Enhancement and Utilization of Plant Genetic Resources

Investigator(s): D.D. Baltensperger and K.P. Vogel

Status: New Hatch project effective October 1, 2002, that contributes to regional research project NC-007

NEB-91-060 (Nutrition and Health Sciences) Identification and Characterization of Grain Sorghum Lipid Compounds Responsible for Lowering Cholesterol Levels in Hamsters

Investigator(s): T.P. Carr, V.L. Schlegel, C.L. Weller and S.L. Cuppett

Status: New Hatch project effective March 1, 2004

NEB-92-042 (Textiles, Clothing and Design) An Exploratory Investigation of Individual, Familial and Community Factors Impacting the Psycho-Social Well-Being of Rural Nebraskan Immigrant Latinas and Their Non-Hispanic Peers

Investigator: R.L. Dalla

Status: New Hatch project effective December 1, 2003



**Grants and Contracts Received
April and May, 2004**

Agronomy and Horticulture	
Drijber, Rhae — USDA/ARS	\$ 85,000
Spalding, Roy — Nebraska Department of Agriculture	25,000
Specht, James — USDA/ARS	75,166
Specht, James — North Central Soybean Research Program	223,421
Staswick, Paul — NSF	118,962
Miscellaneous grants under \$10,000 each	53,900
Animal Science	
Erickson, Galen and Rick Koelsch — USDA through North Carolina State University	29,396
Miscellaneous grants under \$10,000 each	12,750

Biochemistry	
Becker, Donald — NSF	110,000
Gladyshev, Vadim — NIH through University of Nebraska Medical Center	31,900
Gladyshev, Vadim — NIH	252,198
Ragsdale, Stephen — NIH	305,215
Miscellaneous grants under \$10,000 each	6,000
Biological Systems Engineering	
Bashford, Greg — Layman Fund via UN Foundation	10,000
Billesbach, David — USDOE through Lawrence Berkeley Lab	46,177
Entomology	
Higley, Leon — Nebraska Game and Parks Commission	15,000
Hoback, William, Leon Higley and Thomas Hunt — Nebraska Department of Agriculture	18,000
Food Science and Technology	
Ryu, Dojin — Layman Fund via UN Foundation	10,000
Miscellaneous grants under \$10,000 each	1,200
Northeast Research and Extension Center	
Hunt, Thomas — USDA/ARS	15,000
Knezevic, Stevan, Alex Martin and Robert Klein — Nebraska Soybean Board	30,430
Miscellaneous grants under \$10,000 each	11,300
Panhandle Research and Extension Center	
Baltensperger, David — Haven Smith Memorial Fund — via UN Foundation	15,000
Hein, Gary, Drew Lyon and Paul Burgener — USDA/ARS	42,400
Miscellaneous grants under \$10,000 each	12,380
Plant Pathology	
Alfano, James — NSF through Cornell University	96,500
Kang, Ming — Layman Fund via UN Foundation	10,000
Vidaver, Anne — USDA/ARS	25,565
School of Natural Resources	
Gitelson, Anatoly — NASA through Oregon State University	70,711
Merchant, James and Jeff Arnold — Nebraska Emergency Management Agency	37,950
Narumalani, Sunil — Nebraska Game and Parks Commission	21,700
Miscellaneous grants under \$10,000 each	7,500
Veterinary and Biomedical Sciences	
Barletta, Raul — USDA/NRI	270,000
Moxley, Rod — Nebraska Beef Council	45,080
Osorio, Fernando — USDA/ARS	75,000
West Central Research and Extension Center	
Volesky, Jerry — Sampson Range and Pasture Endowment via UN Foundation	10,000
Grand Total	\$2,225,801

Note: An error was made in the April 2004 ARD Newsletter listing of Grants and Contracts Received in February and March, 2004. It stated that an award of \$20,462 from the USDA/FS was awarded to Dean Eisenhauer. Eisenhauer is in Biological Systems Engineering not the School of Natural Resources — Diane.

Diane says

Giving thanks is a course from which we never graduate.