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ARD

Agricultural Research Division News

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June 2003

Volume 36, Number 3

Comments from the Associate Dean

Dear Colleagues,

In 1983, I was fortunate to be offered the position of Associate Dean and Associate Director of the Agricultural Research Division, IANR. I accepted the offer and my family and I moved to Nebraska from the University of Illinois at Urbana-Champaign where I had worked the previous 11 years. Nearly 20 years later, I will be retiring from my ARD research administration responsibilities as of July 1, 2003. I will continue to work as Facilities Director for IANR on a 0.5 FTE basis after that date.

Working for the University of Nebraska and the Institute of Agriculture and Natural Resources has been truly rewarding and enjoyable. In addition to my ARD experiences, I've been privileged to serve in several other interim administrative positions at UNL, including Interim Dean of ARD, Interim UNL Vice Chancellor for Research, Interim Director of the Water Center and Environmental Programs and Interim Director, Center for Sustainable Agricultural Systems. These turned out to be very educational experiences, also.

During these 20 years, we've gone through some very challenging and some very positive circumstances, largely due to cycles in the economy and in the state budgets. Through all of these, I've been impressed with the abilities of the faculty and administration to keep programs moving ahead to meet emerging clientele needs. Wow, how things have changed, however!

In the November 1983 issue of IANR NEWS, the month we arrived in Nebraska, there was an interview with then ARD Dean and Director Irv Omtvedt, wherein he described what the relatively new term "biotechnology" meant and how this technology would be incorporated into future ARD research. As most know, through relatively focused efforts, UNL and ARD have made huge progress in the biotechnology area, with excellent facilities in the Beadle Center, internationally recognized research and significant competitive federal grant support.

In that same newsletter, a policy statement from the Midwest Governors Conference included the following: "The Midwest Governor's Conference recognizes the pressing need to substantially increase the public commitment to education, research and extension programs serving agriculture" and pledges to "work with agriculturalists, educators, industrialists, our state legislators and the members of Congress to make sure that increased support is provided to maintain a strong agriculture through education, research and extension programs."

I feel this is just as correct today as it was 20 years ago and hope that our elected officials now and in the future comprehend this. It falls upon us to help them do so.

The 96th Annual Report of the Nebraska Agricultural Experiment Station for fiscal year 1983-1984 listed annual total ARD research expenditures as about \$25 million and total grant and contract expenditures of about \$5.7 million. In contrast, the 116th Annual Report for fiscal year 2001-2002 listed total agricultural research expenditures of \$66 million and contract and grant expenditures of \$20.6 million. This shows the changing nature of how public research is funded and also spotlights the excellent success that ARD faculty have had in competing for grants and contracts.

I could not begin to list all of the many positive changes I have seen and been a part of over the last 20 years. A great institution such as the University of Nebraska and components such as the Agricultural Research Division will continue to change themselves as new needs arise, while maintaining stability and keeping important traditional programs.

I am happy to have had the opportunity to work with the skilled and committed faculty, staff and administrators in IANR over the years. Despite the current obstacles, I have no doubt that IANR will continue to effectively serve the needs of our clientele far into the future.

*Dale Vanderholm
Associate Dean and Director*



Frontiers in Agricultural Research Food, Health, Environment and Communities

The National Academy of Sciences has recently issued a report from a committee convened to review the USDA Research, Education and Economics (REE) mission area. The report provided recommendations for future opportunities and directions in agricultural research. Some summary statements from the report are given below:

"Over the last century, productivity has been a major focus of agricultural research. Driven by advances in plant and animal genetics, nutrition and health, this research has paid off with major productivity gains, such as the tripling of corn yields over the last 50 years. Today, worldwide changes have shifted agriculture's focus beyond food and fiber production toward goals of improving public health, social well-being and the environment. Agriculture is playing a new and different role in delivering nutritional, pharmaceutical and bio-based products; in providing sound stewardship of resources; and in supporting rural communities. The changing social and scientific context of agriculture requires a new vision of agricultural research — one that will support agriculture as a positive economic, social and environmental force."

The report provides recommendations regarding the process needed to focus REE efforts, which include establishing clearer priority-setting mechanisms, obtaining greater flexibility in funding and shifting research agendas, having greater accountability to stakeholders, and increasing the emphasis on multi-disciplinary research and collaboration. The report also recommended a focus on five major program areas and included examples of research needed within each of these areas:

Globalization — Evaluate impacts of globalization on U.S. agriculture and research priorities; Improve agricultural productivity and product quality while optimizing resource use; and Evaluate the economic, social, health and environmental effect of agricultural practices.

Emerging Pathogens and Hazards in the Food Chain — Reduce the risk of bioterrorism; Improve microbiological food safety; Minimize hazards of food allergens/toxicants; and Manage plant and animal diseases.

Nutrition and Human Health — Advance research on bioactive food compounds; Elucidate genetic mechanisms that affect human health and nutrition; Improve the nutrient content of foods; and Improve understanding of food consumption behavior and its links to health.

Environmental Stewardship — Reduce pollution and conserve natural resources; Advance environmentally sound practices; Deliver new environmental

benefits; and Integrate leading-edge environmental sciences concepts and techniques.

Quality of Life in Rural Communities — Evaluate effects of changes in market structure and Meet the challenge of rural development in a changing context.

Anna Elliott Proposals

Twenty-two proposals were received for the Anna H. Elliott fund. This fund was established in the University of Nebraska Foundation with the stipulation that earnings be used for research in some area of agriculture, particularly in the field of plant sciences, and with preference to plant science in western Nebraska. Five proposals were funded as follows:

David Baltensperger, Panhandle Research and Extension Center
(Bob Graybosch; Ken Vogel and Lenis Nelson, Agronomy-Horticulture)

"Alternative Crop Improvement for the High Plains"

Total Amount Received \$15,000

Funding Period: May 1, 2003 - April 30, 2004

Drew Lyon, Panhandle Research and Extension Center
(Tim Arkebauer, Agronomy-Horticulture; David Baltensperger, Panhandle Research and Extension Center; David Nielsen, USDA-ARS)

"Evaluating Spring Crops for Use in a Flexible Fallow System"

Total Amount Received \$15,000

Funding Period: May 1, 2003 - April 30, 2004

Patrick Reece, Panhandle Research and Extension Center

(Walter Schacht, Agronomy-Horticulture; Jerry D. Volesky, Panhandle Research and Extension Center)

"Validation of SanDRIS: A Decision-support Tool for Grazing Management on Sandhills Rangeland"

Total Amount Received \$11,340

Funding Period: May 1, 2003 - April 30, 2004

Jose Payero, West Central Research and Extension Center

"Using Weighing Lysimeters to Improve Accuracy of Crop Water Use Data"

Total Amount Received \$15,000

Funding Period: May 1, 2003 - April 30, 2004

David Tarkalson, West Central Research and Extension Center

(Rhae Drijber and Achim Dobermann, Agronomy-Horticulture)

"The Fate of Bt Corn Residue in Irrigated Corn Production"

Total Amount Received \$11,000

Funding Period: May 1, 2003 - April 30, 2004

ARD Interdisciplinary Research Grants Program

Fourteen proposals were submitted to the ARD Interdisciplinary Research Grants Program and two proposals were selected for 2003-2004 funding. We were, however, able to fund four continuation projects. New ARD Interdisciplinary Research Grants were awarded as follows:

Stephen Danielson, Entomology Department
(Thomas Hunt, Entomology Department; James Brandle, School of Natural Resource Sciences, Erin Blankenship, Biometry Department)
"Synchronizing Habitat Enhancement Practices with Predator Mobility for Control of Alfalfa Insect Pests"
Total Amount Received: \$19,790
Funding Period: July 1, 2003 - June 30, 2004

Andrea Cupp, Animal Science Department
(Melanie Simpson, Biochemistry Department)
"Role of Hyaluronan during the Ovulatory Process in the Beef Cow"
Total Amount Received: \$20,000
Funding Period: July 1, 2003 - June 30, 2004

The following continuing projects have been evaluated and will continue for 2003-2004:

Janos Zempleni, Nutritional Science and Dietetics
(Peter Moeller, Nutritional Science and Dietetics)
*"Regulation of Biotinylation of Histones in *Saccharomyces cerevisiae*"*
Total Amount Received: \$20,060
Funding Period: July 1, 2003 - June 30, 2004

William Zanner, School of Natural Resource Sciences
(Rhea Drijber, Agronomy-Horticulture Department)
"Long-term Forest Establishment on Prairie: Effects on Soil Microbiological, Mineralogical, Physical, and Chemical Properties"
Total Amount Received: \$20,000
Funding Period: July 1, 2003- June 30, 2004

Kay Stanek, Nutritional Sciences and Dietetics
(Sheran Cramer, Rochella Dalla, Family and Consumer Sciences; Mary Balluff, Nutritional Sciences and Dietetics)
"Lead Status, Food Provision Competence and the Parenting of Iron Deficient Children Enrolled in the Special Supplement Food Program for Women, Infants, and Children (WIC)"
Total Amount Received: \$19,812
Funding Period: July 1, 2003 - June 30, 2004

Galen Erickson, Animal Science Department
(Dennis Schulte, Biological Systems Engineering)
"Science-based Air Quality Data for the Beef Cattle Feedlot Industry and Rural Communities in Nebraska"
Total Amount Received: \$19,650
Funding Period: July 1, 2003 - June 30, 2004

Sampson Range Pasture Management Endowments

Eight proposals were submitted to the ARD Sampson Range and Pasture Management Endowment and six are being funded for 2003-2004. This endowment was established in the University of Nebraska Foundation by the widow of Arthur William Sampson to support range and pasture management programs at the University of Nebraska. Sampson proposals were awarded to the following:

Walter H. Schacht, Agronomy-Horticulture Department
(Lowell Moser, Bruce Anderson, Agronomy-Horticulture Department; Bill Zanner, School of Natural Resource Sciences; James Gosey, Animal Science Department)
"Role of Interseeded Legumes in Soil Carbon and Nitrogen and Herbage Production in Nebraska Pastureland"
Total Amount Received: \$8,430
Funding Period: May 1, 2003 - April 30, 2004

Susan Tunnell, Agronomy-Horticulture Department
(James Stubbendieck, Agronomy-Horticulture Department)
"Vegetation Response to Fall Applied Herbicide in a Smooth Brome Dominated Tallgrass Prairie"
Total Amount Received: \$4,730
Funding Period: May 1, 2003 - April 30, 2004

Johannes (Jean) Knops, School of Natural Resource Sciences and School of Biological Sciences
"Rhizodeposition"
Total Amount Received: \$9,120
Funding Period: May 1, 2003 - April 30, 2004

Larkin Powell, School of Natural Resource Sciences
"Quantifying Effects of Grazing in Sandhills Pastures on Bird Communities Through a Multi-scale Approach to Vegetation Measurements"
Total Amount Received: \$7,500
Funding Period: May 1, 2003 - April 30, 2004

Patrick Reece, Panhandle Research and Extension Center
"Fall Green-up and Defoliation Effects on Subsequent-year Growth of Cool-season Graminoids on Mixed-grass Prairie"
Total Amount Received: \$9,700
Funding Period: May 1, 2003 - April 30, 2004

Jerry Volesky, West Central Research and Extension Center
(Bruce Anderson, Agronomy-Horticulture Department)
"Clipping Stubble Height Effects on Irrigated Cool-season Perennial Grasses"
Total Amount Received: \$10,000
Funding Period: May 1, 2003 - April 30, 2004

Helen Porter Van Spronsen Charitable Trust

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A charitable trust was established at the University of Nebraska Foundation for Helen Porter Van Spronsen by Lucille Porter. The trust mandates that funds be used for agricultural and water research or related farm and agricultural study. Funds are for a graduate research assistant (GRA) assigned to an approved ARD project in range and livestock research at the Gudmundsen Sandhills Laboratory. The funds were awarded to:

Don C. Adams, West Central Research and Extension Center

(Terry Klopfenstein and Michelle Wells, Animal Science Department; Jerry Volesky, West Central Research and Extension Center)

"Determining Dietary Protein and Energy for Cattle Grazing Sandhills or SW Nebraska Range"

Total Amount Received: \$9,000

Funding Period: June 1, 2003 - May 31, 2004

Ralph H. Bainbridge Memorial Fund

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A charitable memorial fund was established at the University of Nebraska Foundation through the Ralph H. Bainbridge Estate. These funds are to be used to support interdisciplinary research teams working in the areas of beef production and grassland research and development. Three proposals were received and three were awarded.

Walter Schacht, Agronomy-Horticulture Department (Eric Mousel, Agronomy-Horticulture Department; Pat Reece, Panhandle Research and Extension Center; Bill Zanner and David Wedin, School of Natural Resource Sciences)

"Comparison of Soil Carbon and Nitrogen Budgets in Cool Season and Warm Season Dominated Meadows in the Nebraska Sandhills"

Total Amount Received: \$4,650

Funding Period: June 1, 2003 - May 31, 2004

Don C. Adams, West Central Research and Extension Center

(Terry Klopfenstein and Michelle Wells, Animal Science Department; Jerry D. Volesky, West Central Research and Extension Center)

"Determining Dietary Protein and Energy for Cattle Grazing Sandhills or Southwest Nebraska Range"

Total Amount Received: \$5,000

Funding Period: June 1, 2003 - May 31, 2004

David P. Shelton, Northeast Research and Extension Center

(Walter Schacht and Roch Gaussoin, Agronomy-Horticulture Department; Charles Shapiro, Northeast Research and Extension Center; Stevan Knezevic, Haskell Agricultural Lab.)

"Growth Characteristics of Selected Conservation Buffer Plant Materials"

Total Amount Received: \$5,000

Funding Period: June 1, 2003 - May 31, 2004

Arch and Frances Jorgensen Fund

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A charitable trust was established at the University of Nebraska Foundation through the estate of Arch and Frances Jorgensen. The funds were designated as research initiative funds for new research addressing agricultural research priorities in Sandhills and graduate student fellowship supplement for students conducting research on crop production on sandy soils, range management and ecology of beef/range systems. This foundation grant was awarded to:

Don C. Adams, West Central Research and Extension Center

"Determining Dietary Protein and Energy for Cattle Grazing Sandhills or SW Nebraska Range"

Total Amount Received: \$2,300

Funding Period: June 1, 2003 - May 31, 2004

New or Revised Projects

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

NEB-10-149 (Agricultural Economics) Enhancing Public Understanding of the U.S. Beef Market Through Industrial Organization Research and Education

Investigator: Azzeddine M. Azzam

Status: New Hatch project effective March 1, 2003

NEB-10-150 (Agricultural Economics) Economic Analysis of Nebraska Cropping Systems

Investigator: Glenn Helmers

Status: New Hatch project effective April 1, 2003

NEB-12-295 (Agronomy) Soil and Water Management for Improving Sorghum Production in Eastern Africa

Investigator(s): Charles S. Wortmann and Martha Mamo

Status: New State project effective January 2, 2002

NEB-13-110 (Animal Science) Molecular Mechanisms Regulating Skeletal Muscle Growth and Differentiation

Investigator: Steven J. Jones

Status: Revised Hatch project effective October 1, 2000 that contributes to regional project NC-131

NEB-13-159 (Animal Science) Transcriptional Regulation of the Porcine Gonadotropin-Releasing Hormone (GNRH) Receptor Gene

Investigator: Brett R. White

Status: New Hatch project effective October 1, 2002

NEB-13-163 (Animal Science) Improving Profitability and Sustainability of Beef Feedlot Production Through Nutrient Management and Corn Milling Coproduct Utilization

Investigator: Galen Erickson

Status: New Hatch project effective April 1, 2003

NEB-17-071 (Entomology) Development of Resistance Management Techniques for Corn Insect Pests in Nebraska

Investigator: Blair D. Siegfried

Status: Revised Hatch project effective July 7, 2002

NEB-17-081 (Entomology) Conservation of Insect Predators of Alfalfa Insect Pests Using Harvest Management, Vegetative Landscape Features, and Artificial Honeydew

Investigator: Stephen D. Danielson

Status: New Hatch project effective July 1, 2003

NEB-24-036 (AgLEC) Relationship of Servant Leadership to Other Leadership Theories and Role in Explaining Follower Behavior and Organizational Effectiveness in Nebraska

Investigator: Daniel W. Wheeler

Status: New State project effective July 1, 2002

NEB-40-022 (School of Natural Resource Sciences) Mammals of Nebraska: Biodiversity and Natural Resources

Investigator: Hugh H. Genoways

Status: New State project effective April 1, 2003

NEB-40-024 (School of Natural Resource Sciences) State-Wide Groundwater Resource Assessment: Focus on Arsenic

Investigator: David C. Gosselin

Status: New State Project effective March 1, 2003

NEB-40-025 (School of Natural Resource Sciences) Remote Sensing of the Biophysical Characteristics of Agricultural Vegetation

Investigator(s): Donald C. Rundquist and Anatoly Gitelson

Status: New State project effective May 2, 2003

NEB-44-052 (Panhandle Research and Extension Center) The Economics of Alternative Beef Cattle Marketing and Feeding Strategies

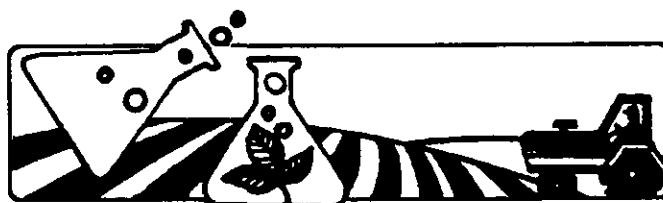
Investigator: Dillon Feuz

Status: Revised Hatch project effective November 1, 2002

NEB-91-057 (Nutritional Science and Dietetics) Regulatory Mechanisms of Intestinal Cholesterol Absorption

Investigator: Timothy P. Carr

Status: New Hatch project effective January 1, 2003



Grants and Contracts Received April and May, 2003

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Agronomy-Horticulture	
Mackenzie, Sally — Ralph and Alice Raikes Chair in Plant Science Via UN Foundation	\$16,000
Miscellaneous grants under \$10,000 each	74,460
Animal Science	
Beermann, Donald — Brinegar Faculty Development via UN Foundation	14,472
Miscellaneous grants under \$10,000 each	7,500
Biochemistry	
Banerjee, Ruma and Sebastian Oltean — American Heart Association	75,000
Markwell, John, John Osterman and Pat Herman — USDOE	94,000
Biological Systems Engineering	
Eisenhauer, Dean E., Thomas G. Franti and Michael G. Dosskey — USDA/FS	10,911
Biometry	
Miscellaneous grants under \$10,000 each	3,625
Center for Grassland Studies	
Miscellaneous grants under \$10,000 each	4,972
Entomology	
Siegfried, Blair D. and Thomas E. Hunt — USDA/RAMP through Penn State	283,913
Miscellaneous grants under \$10,000 each	19,600
Food Science and Technology	
Thippareddi, Harshavardhan — USDA/CSREES through Kansas State University	158,918
Miscellaneous grants under \$10,000 each	45,980
Northeast Research and Extension Center	
Miscellaneous grants under \$10,000 each	37,800
Panhandle Research and Extension Center	
Miscellaneous grants under \$10,000 each	54,962
Plant Pathology	
Giesler, Loren J. and James P. Stack — Nebraska Department of Ag.	50,000
Mitra, Amit — NSF	390,000
School of Natural Resource Sciences	
Verma, S.B., K.G. Cassman, T.J. Arkebauer, A. Doberman, K.G. Hubbard, J.M.H. Knops, D.T. Walters, and Haishun Yang — USDOE	300,000
Wilhite, Donald — NATO	25,000
Miscellaneous grants under \$10,000 each	12,956
Veterinary and Biomedical Sciences	
Miscellaneous grants under \$10,000 each	567
West Central Research and Extension Center	
Miscellaneous grants under \$10,000 each	15,625
Grand Total	\$1,696,261

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

Daniel Pomp — Biotechnology Research Development Corp — Identifying Genes Controlling Porcine Litter Size — \$351,850

Roy F. Spalding, Imtiyaz A. Khan and Jeannette Thursten-Enriquez — EPA — Enhanced *in situ* Biodentrification (EISBD): An Innovative Treatment Alternative for Small Municipal Ground-Water Systems — \$242,408

Ruma Banerjee — DHHS-NCRR — Supplement — Nebraska Redox Biology Center Renovation — \$497,596

Michael J. Hayes, Donald A. Wilhite and Kenneth Hubbard — USGS — Improved Drought Monitoring Through the Integration of Climate and Satellite-Based Data — \$241,095

Lance J. Meinke — USDA/ARS — Corn Rootworm Basic Biology Toward Optimizing Resistance Management Strategies — \$62,407

Jeffrey D. Cirillo — NIH/NIAID — Genes Associated with *M. avium* Pathogenesis — \$71,261

David Gosselin, F. Edwin Harvey and Matt Joeckel — EPA — A Strategy for Small Water Supply Systems in Nebraska: Focus on Arsenic — \$152,143

Kyle Hoagland and James Brandle — USDA/NAC — Change in Filter Strip Performance Over Time: An Evaluation of Runoff Chemistry — \$23,570

Daniel Pomp — NIH — Integrative Genetics of Cancer Susceptibility — \$1,141,457

Sally Mackenzie — NIH — Mitochondrial Genome Dynamics in Arabidopsis — \$1,249,880

Ruma Banerjee — NIH — Mechanism of Methylmalonyl — coA Mutase: A Radical Enzyme — \$1,343,750

Viacheslav Adamchuk and Achim Dobermann — USDA/SBIR through Veris Technologies — A Soil Sampling System for On-the-Go Analysis and Mapping of pH and Other Properties — \$60,654

Jeffrey D. Cirillo and Gerald E. Duhamel — NIH/NIAID — Small Business Biodefense Program — \$188,783

S.B. Verma, R. Ballinger, K.G. Cassman, T.J. Arkebauer, A. Dobermann, A.A. Gitelson, K.G. Hubbard, J.M.H. Knops, D.C. Rundquist, D.T. Walters, E.A. Walter-Shea and Haishun Yang — DOE-EPSCoR — Carbon Sequestration and Global Climate Change — \$1,992,066

Clinton Jones and Alan Doster — NIH — Analysis of the anti-apoptotic properties of HSV-1 LAT — \$1,631,250

James E. Specht — USDA/ARS — Positioning of Classical Soybean Genes on the Genome Map of Soybean — \$310,496

Xun-Hong Chen — USGS — Modeling of Streamflow Dynamics in Alluvial Valleys with Irrigated Agriculture — \$64,466

Marvin P. Carlson — USDOE through KSU — High Plains Regional Carbon Sequestration Partnership — \$100,000

P. Blum, S. Adenwalla, A. Benson, D. Berkowitz, and R. Bonnstetter — NASA — Nebraska Astrobiology Institute — \$5,666,038

Robert Caldwell and Richard Sincovec — NASA — Preadaptation in a Modeling Framework for Weather/Hydrology/Soil-C Management Systems — \$857,685

Albert Peters — NASA — Forecasting Vegetation Greenness with Satellite and Climate Data — \$485,841

Anatoly Gitelson, Darrell Nelson, James S. Schepers and Kyle Hoagland — A Robust Generic Rapid Non-destructive Quantification of Plant Photosynthetic Pigments: Techniques, a Field-Portable Instrument and Methodology for Plant Stress Assessment — \$591,546

Timothy P. Carr and Curtis L. Weller — USDA/MAFMA — Plasma Cholesterol Levels in Hamsters Fed Sorghum Lipid Supplements — \$10,000

William F. Wilcke — USDA/CSREES — North Central Region Sustainable Agriculture Research and Education Program — \$3,024,074

Diane says

Failure can become a weight
or it can give you wings.