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Agricultural Research Division News

October 2006

Comments from the Dean

There was a time our world did not worry about the resources it consumed. People thought them infinite. No one knew resources could be totally depleted, never to be seen again.

That time is past. Long past.

Today we know that if our state, our society, and our world are to survive and thrive, we must develop a renewable society, a sustainable society. A society that replenishes the resources it uses in ways that do not damage and may actually improve the environment.

The question is – how?

We – the researchers in our Agricultural Research Division and our colleagues around the world – are the people who get to discover scientific answers to that question.

We're the ones who get to lead the way toward that remarkable, renewable, sustainable future.

We're the ones who get to imagine not only that brave new world, but the knowledge we will need to get there, and the knowledge that will help our state and world build and grow.

William Arthur Ward once said, "If you can imagine it you can achieve it." I'd say land-grant scientists have tremendous imaginations, given all achieved down through the years. Sometimes I think of the knowledge yet to be imagined by researchers who will follow us in the long continuum of scientific discovery, and I am so proud to be part of this continuum, working with all of you to build the base upon which future knowledge will grow.

Here in Nebraska one of the questions we need to carefully consider is what kind of research we must do to position our state to take advantage of and be a leader in the bio-based economy a renewable, sustainable future demands.

A move to a sustainable society means a biology-based economy. Today we see places with coal mines and oil wells as the center of economic action. When we reach an economy based on renewable resources, the center of that economy will be the places those resources grow.

That's exciting for Nebraska. It's exciting for the scientists who work here and exciting for the agricultural community of the state. Nebraska can become that center of the new bio-based economy.

So. How do we determine the areas in which Nebraska has the best bioscience growth potential? How do we position our

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state to take advantage of that potential? How do we determine the possibilities and consequences that might have for our state, and provide essential knowledge to balance the two?

We have a responsibility to answer those questions here in ARD.

As a society we've long tended to do what we need to do over a short period of time to get us through. As scientists we must look for long-term solutions to provide the best, most complete information possible so our society can make informed decisions as to what it will and will not do and become.

I look forward to working with you on that important mission.

Gary L. Cunningham
Dean and Director

UNL Temporarily Suspends Hunting on Land After Court Ruling

Hunting and certain other recreational activities are being suspended, at least temporarily, on University of Nebraska–Lincoln properties in the wake of a Nebraska Supreme Court ruling that raises new questions about liability exposure for injuries suffered on public land.

Among the most immediate impacts: About 10,000 acres of land at the University's Agricultural Research and Development Center near Mead, a popular hunting spot in past years, is off-limits during the pheasant hunting and bow hunting for deer seasons.

The temporary suspension of hunting applies also to other University-owned sites, including Gudmundsen Sandhills Laboratory near Whitman, the Dalbey-Halleck farm near Virginia, Neb., the Horning State Farm in Cass County and the University's Cedar Canyon property in Lincoln County.

The University is among many government entities reassessing what they allow on their property after the state's highest court last month ruled that the state's Recreational Liability Act does not protect governments from lawsuits over injuries suffered in recreational activities on public property. The act is meant to shield only private landowners, the court decided.

It's expected the Nebraska Legislature next year will consider legislation that would restore those protections from

liability to government agencies.

Until then, however, the potential liability exposure for taxpayers is too great to allow business as usual, said Alan Moeller, Assistant Vice Chancellor of the University's Institute of Agriculture and Natural Resources, which administers the ARDC and other properties.

Moeller emphasized this is a temporary suspension. If the Legislature reinstates the protections from liability to governments, UNL again could allow hunting and other recreational activities. "We take this step reluctantly, but we feel we have no choice," Moeller said. "If we ignore this ruling, we would be leaving taxpayers open to potentially millions of dollars in damages if someone was hurt on one of our properties."

Moeller said UNL made its decision after consulting with University legal counsel and officials with the Nebraska Game and Parks Commission.

Although hunting is the most immediate concern, Moeller noted that UNL allows other types of recreational activities on some of its properties. University officials are compiling a list of those activities and likely will suspend them, too.

Mussehl Endowment 2006-2007

Nine proposals were submitted for the Mussehl Endowment. This substantial endowment was established in the University of Nebraska Foundation by the Mussehl Estate to support poultry research programs at UNL. Projects eligible for support from the Endowment include poultry management, health, nutrition, physiology, waste management and utilization, and poultry product research. The following proposals were funded:

Sheila Scheideler, Animal Science
"Dried Distillers Grains with Solubles in Laying Hen Rations"
Funded: \$25,254 Oct. 1, 2006 - Sept. 30, 2007

Jeyamkondan Subbiah, Biological Systems Engineering
Glenn Froning, Food Science and Technology
Ashok K. Samal, Computer Science and Technology
"A Machine Vision System for Detecting Eggshell Defects"
Funded: \$24,970 Oct. 1, 2006 - Sept. 30, 2007

Jens Walter, Food Science and Technology
Sheila Scheideler, Animal Science
"Identification of Novel Enzymes for the Supplementation of Poultry Feed Using a Metagenomic Approach"
Funded: \$25,000 Oct. 1, 2006 - Sept. 30, 2007

Harshavardhan Thippareddi, Food Science and Technology
Roger Mandigo and Dennis Burson, Animal Science
"Reducing the Risk of Listeria monocytogenes in Natural and/or Organic Processed Poultry Meat Products"
Funded: \$25,000 Oct. 1, 2006 - Sept. 30, 2007

Channing B. and Katherine W. Baker Fund 2006-2007

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.

Funds are awarded for a GRA. A graduate student working on an 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. Three proposals were awarded to:

Steve Baenziger, Agronomy and Horticulture
"Response Different Wheat Plant Height (Rht) Genes in Diverse Environment at Nebraska"
Funded: \$12,000 Aug. 1, 2006 - July 31, 2007

Viacheslav Adamchuk, Biological Systems Engineering
"Delineation of Differentiated Management Areas Within an Agricultural Field"
Funded: \$12,000 Aug. 1, 2006 - July 31, 2007

Patrick Shea, School of Natural Resources
"Graphite and Carbide Catalysts for Management of Soil and Sediment Quality"
Funded: \$12,000 Aug. 1, 2006 - July 31, 2007

Recognition of Junior Faculty for Excellence in Research

In 1991, the ARD Advisory Council established a program to recognize the research accomplishments of junior faculty members. Typically, two junior faculty are recognized each year. The recognition consists of a certificate, engraved plaque, and \$3,000 for professional development or research-related activities.

Criteria used to evaluate nominees include scientific publication record, especially those publications resulting from research at UNL, external grant funding and recognition by peers. A sub-committee of the ARD Advisory Council evaluates the nominations and recommends recipients to the Dean for Agricultural Research.

The following faculty were selected for recognition during the 2006-2007 academic year:

Dr. Melanie Simpson, Assistant Professor, Biochemistry
Dr. Andrew Tyre, Assistant Professor, School of Natural Resources

Congratulations to Drs. Simpson and Tyre! A call for nominations is issued each year on or about July 1. We encourage faculty and administrators to nominate deserving junior faculty in their units.

New or Revised Projects July and August 2006

NEB 13-178 W-1171, Germ cell and embryo development and manipulation for the improvement of livestock

Investigator: Brett White, Animal Science

Status: Multistate project effective Oct. 1, 2005, through Sept. 30, 2009

NEB 19-020 Midwest Advanced Food Manufacturing Alliance

Investigator: Steve Taylor, Food Science and Technology

Status: Special grant project effective July 15, 2006, through July 14, 2007

NEB 22-313 Contribution of fusarium lateritium to weed suppressive soils and weed abundance

Investigator: John Lindquist, Agronomy

Status: Grant project effective Aug. 1, 2006, through July 31, 2009

NEB 22-314 Soybean breeding and genetic studies

Investigator: George Graef, Agronomy

Status: Grant project effective July 1, 2006, through June 30, 2011

NEB 28-087 Quantifying risk factors for evolution of European corn borer resistance to Cry1F expressing corn hybrids

Investigator: Blair Siegfried, Entomology

Status: Grant project effective Sept. 1, 2006, through Aug. 31, 2009

NEB 30-111 Rubisco Phylogenetic Engineering

Investigator: Robert Spreitzer, Biochemistry

Status: Grant project effective Sept. 15, 2006, through Sept. 14, 2008

NEB 36-062 Biotin affects cytokine metabolism

Investigator: Janos Zempleni, Nutritional and Health Sciences

Status: Grant project effective Sept. 1, 2006, through Aug. 31, 2009

NEB 36-063 Mechanisms of biotin homeostasis

Investigator: Janos Zempleni, Nutritional and Health Sciences

Status: Hatch project effective July 15, 2006, through July 14, 2011

NEB 43-101 The ecology, etiology, and management of crop diseases important to western Nebraska

Investigator: Robert Harveson, Panhandle Research and Extension Center

Status: Hatch project effective Jan. 1, 2006, through Dec. 31, 2010

Proposals Submitted for Federal Grants July and August 2006

The following is a listing of proposals that were submitted during July and August 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.

Shripat Kamble and Chris DeHeer — NSF — Collaborative research: An experimental study of colony boundary disintegration in the termite *Reticulitermes flavipes* — \$279,714

Curt Weller — USDA-ARS — Development of sorghum lipids as nutraceuticals — \$32,000

Ruma Banerjee — NIH — Transsulfuration and hyperhomocysteinemia — \$1,600,550

Donald Becker — NIH — Mechanistic studies of functional switching in the PutA Flavoprotein — \$1,454,816

David Carter, Rhae Drijber and Leon Higley — NSF — Carcass decomposition and the resource island hypothesis: the influence of carcass mass on carbon, nitrogen, phosphorus — \$322,818

Jaekwon Lee — NSF — Mechanistic insights into homeostatic copper transport — \$599,916

Blair Siegfried — USDA-ARS — Contributions to a framework for managing insect resistance to transgenic crops — \$25,000

Steven Harris — NSF — Constructing a Genetic Interaction Network for Polarity Determinants in Filamentous Fungi — \$305,289

Steve Thomas — NSF — Coupling consumer-resource interactions and nutrient spiraling in a stream network — \$111,666

Thomas Hunt — USDA-ARS — Contributions to a framework for managing insect resistance to transgenic crops — \$15,000

Amit Mitra — NASULGC/USDA-FAS — Capacity development in plant biotechnology research: Broad-spectrum disease resistance in transgenic crops — \$89,090

Blair Siegfried — USDA-ARS — A bacterial artificial chromosome library for the western corn rootworm — \$6,000

David Steffen, Dee Griffin, Arden Wohlers and Clayton Kelling — USDA-CSREES — NAHLN-Nebraska — \$50,000

Suat Irmak— NSF — CAREER: On the uncertainty in inequality of energy transfer coefficients for vertical eddy transports for different surfaces — \$546,711

Thomas Powers — NSF — Nematodes of the tropical rain forests of Costa Rica: Linking morphology and MOTUs — \$154,526

Cody Knutson, Michael Hayes and Jae Ryu — NOAA — Application of a decision support system for sustainable water management utilizing climate scenarios - a case study of India — \$299,832

Cody Knutson, Mark Svoboda and Jae Ryu — NOAA — Development of a drought decision support portal for the Republican River basin of Colorado, Nebraska and Kansas — \$227,453

Blair Siegfried and John Foster — USDA-CSREES — Risk of western corn rootworm adaptation to transgenic corn — \$106,814

George Graef, Thomas Clemente, James Steadman and Tamra Jackson — USDA-ARS — Sclerotinia resistance enhanced by accumulation of QTL and transgenic approaches — \$78,000

Rachel Simpson and Robert Kaul — NSF — The Bessey Herbarium Online: Constructing a searchable online database and interactive mapping system for Nebraska plant specimens — \$498,471

Qi Cheng — NSF — Functional investigation of long chain fatty alcohol oxidases (FAOs) from fungi towards higher plants — \$1,124,200

Ruma Banerjee — NIH— Redox Biology Center — \$10,826,394

Stephen Ragsdale — Department of Energy — Enzymology of methanogenesis: Mechanism of methyl-coenzyme M reductase — \$1,231,905

Daniel Snow and Galen Erickson — EPA STAR — Fate and effect of exogenous steroids released from combination implants used by the beef cattle industry — \$429,572

Steve Comfort and Vitaly Ziotnik — Environmental Science and Technology Certification — Using electrical resistivity imaging to evaluate permanganate performance during an in situ treatment of a RDX-contaminated aquifer — \$98,777

Xun-Hong Chen, Ashok Samal, Leen Kiat Soh, Alan Tomkins and Sandra Zellmer — NSF Digital Government Program — Building knowledge discovery and information fusion tools for collaborative systems to adaptively manage uncertain hydrological resources — \$552,700

Donald Becker — NIH — Spectroelectrochemistry of the Novel PutA Flavoprotein — \$92,406

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 hot-pathogen coevolution — \$15,610

Kyle Hoagland — EPA — Aquatic toxicology cooperative training program in the Missouri River basin — \$899,566

Grants and Contracts Received for July and August 2006

Agronomy and Horticulture:

Walter Schacht — Nebraska Department of Roads	\$71,281.00
Mary Shipman — Nebraska Wheat Board	\$47,000.00
Stephen Baenziger — Nebraska Wheat Board	\$70,000.00
Lenis Nelson — Nebraska Wheat Board	\$12,000.00
Timothy J. Arkebauer — U.S. Department of Energy	\$99,741.00
John Lindquist, Gary Yuen and Rhae Drijber — NRI	\$366,186.00
George Graef, Thomas Clemente, James Steadman and Tamra Jackson — USDA-ARS	\$78,000.00
Robert Shearman — U.S. Golf Association	\$90,000.00
Miscellaneous Grants under \$10,000 each	\$58,200.00

Animal Science:

Chris Calkins — National Cattlemen's Beef Association	\$46,156.00
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Biochemistry:

Ruma Banerjee — NIH	\$290,545.00
Vadim Gladyshev — NIH	\$284,700.00
Ruma Banerjee — NIH	\$2,081,389.00
Vadim Gladyshev — NIH	\$39,372.00
Mark Wilson — American Parkinson Disease Association	\$50,000.00
Vadim Gladyshev — NIH	\$246,193.00
Robert Spreitzer — NRI	\$202,383.00
Donald Becker — NSF	\$284,160.00

Biological Systems Engineering:

Curt Weller — USDA-ARS	\$32,000.00
Suat Irmak, Gary L. Zoubek, Andrew P. Christiansen, Jennifer M. Rees and Brandy VanDeWalle — USDA-NRCS	\$65,400.00

Entomology:

W. Wyatt Hoback — Bureau of Land Reclamation	\$9,228.00
Miscellaneous Grants under \$10,000 each	\$13,000.00

Food Science and Technology:

Richard Goodman — Monsanto Company	\$12,874.00
Stephen L. Taylor — USDA-CSREES	\$462,110.00
Richard Goodman — Pioneer HiBred International	\$12,874.00
Miscellaneous Grants under \$10,000 each	\$20,785.00

Industrial Agricultural Products Center:

Milford Hanna — Nebraska Corn Board	\$16,745.00
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Northeast Research and Extension Center:

Thomas Hunt — USDA-ARS	\$15,000.00
Thomas Hunt, Tiffany Heng-Moss and Leon Higley — North Central Soybean Research Program	\$15,296.00
Miscellaneous Grants under \$10,000 each	\$19,000.00

Panhandle Research and Extension Center:

Gary Hein — Nebraska Wheat Board	\$15,000.00
Alex Pavlista, Carlos Urrea, Gary Hergert and Jim Schild — Nebraska Dry Bean Commission	\$11,000.00
Carlos Urrea, Robert Harveson, James Steadman and Jim Schild — Nebraska Dry Bean Commission	\$35,000.00
Charles Hibberd — Nebraska Dry Bean Commission	\$35,000.00
Robert Wilson — Monsanto Company	\$220,000.00
Miscellaneous Grants under \$10,000 each	\$91,800.00

Plant Pathology:

James R. Steadman — USDA-ARS	\$60,875.00
Loren Giesler — National Legume Risk Management Tool Development	\$18,828.00
Jennifer Chaky — Nebraska Department of Agriculture	\$10,000.00
Stephen Wegulo — Nebraska Wheat Board	\$28,380.00
Loren Giesler — NCSRP-USDA	\$15,000.00
Loren Giesler — NCSRP	\$15,000.00
Gary Yuen — USDA-ARS	\$27,318.00
Miscellaneous Grants under \$10,000 each	\$75,800.00

School of Natural Resources:

Xun-Hong Chen — Upper Big Blue NRD	\$16,000.00
James Merchant, Milda Vaitkus and Don Rundquist — U.S. Geological Survey	\$84,000.00
John Holz, Aris Holz and Kyle Hoagland — Nebraska Department of Environmental Quality	\$152,588.00
Jim Merchant and Chad Boshart — Nebraska Emergency Management Agency	\$10,373.00
Steve Thomas — NSF	\$111,666.00
Donald Wilhite — USDA-NRI	\$205,177.00
Kyle Hoagland — U.S. Fish and Wildlife Service	\$10,000.00
Anatoly Gitelson — NASA	\$89,998.00
Richard Tyre (Drew) — Nebraska Game and Parks	\$65,000.00

Jim Merchant and Chad Boshart —

Nebraska Emergency Management Agency	\$139,008.00
Scott Hygnstrom — Nebraska Game and Parks	\$55,000.00
Miscellaneous Grants under \$10,000 each	\$13,660.00

Statistics:

Kent Eskridge — Nebraska Health and Human Services	\$24,415.00
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Veterinary and Biomedical Sciences:

David Steffen and Clayton Kelling — Nebraska Department of Agriculture	\$171,485.00
Gerald Duhamel — NIH	\$69,218.00
David Steffen — Nebraska Department of Agriculture	\$48,000.00
Marjorie Lou — NIH	\$437,365.00
Miscellaneous Grants under \$10,000 each	\$1,500.00

West Central Research and Extension Center:

Miscellaneous Grants under \$10,000 each	\$2,800.00
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TOTAL	\$7,477,872.00
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