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ARD News June 1999

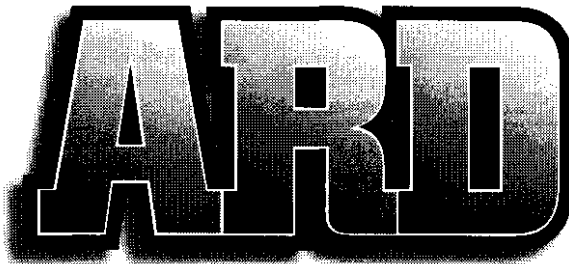
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Agricultural Research Division News

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Volume 33, Number 5

Comments from the Dean

Dear Colleagues:

As indicated in the April issue of **ARD News**, IANR is currently developing a plan to address the reallocation tax imposed by the University of Nebraska System and the UNL campus. Vice Chancellor Omtvedt and the Deans are attempting to identify as much money as possible at the IANR and CASNR/division levels to minimize the burden on units. We are also looking at ways to reduce administrative costs at all levels within IANR, including a reduction in the number of our units. Major efforts will be devoted to identifying lower priority programs that could be eliminated and to enhancing income from grants, contracts, gifts and fees. We are seeking your assistance in developing some innovative solutions to the situation that IANR is facing.

We are anticipating a 5-6 percent reallocation tax over the biennium starting July 1, 1999. All units have identified 3.5 percent of their budget base for reallocation. Actual reallocation assessments will be determined on a unit-by-unit basis following study by the IANR Administrative Council and discussion with the unit administrators. It is likely that the reallocation tax will vary significantly among units.

To pay our portion of the reallocation tax, ARD will be using funds that have previously been assigned to competitive seed money programs available to all faculty. These programs will likely disappear, but this sacrifice will result in more resources staying at the unit level. We are also looking for savings in our office operations to use for a portion of the reallocation tax.

As of July 1, ARD will have some new sources of funding available for assignment to research faculty. We anticipate having \$145,000 in new Hatch funds to

assign to faculty on a competitive basis and a 2 percent increase in state operating funds. We also obtained a 4.75 percent increase in faculty, staff and GRA salaries and wages for FY 2000. Although these increases do not offset the challenges caused by the reallocation tax, they do provide a measure of hope for the future.

We appreciate your support and encouragement during this difficult time. It is very important that all of us continue to perform at the highest possible level, including becoming more competitive for external funds. We can control much of our destiny by working creatively and diligently.

*Darrell W. Nelson
Dean and Director*

National Research Initiative Awards for FY 1998

In FY 1998, a total of 2,579 proposals were submitted to the NRI — approximately 9 percent fewer than the number submitted in FY 1997 and 16 percent fewer than the number submitted in FY 1996. A total of \$541.1 million was requested in FY 1998. The total amount of funds awarded was \$88.1 million in 699 grants.

The success rate for proposals was 25 percent, which is higher than in previous years. The average standard grant award was \$144,666 with an average duration of 2.3 years.

During FY 1998, the NRI provided funds totaling \$252,000 in partial support of 37 conferences. Likewise, the NRI provided funds totaling \$15.46 million in Agricultural Research Enhancement Awards. Listed below are the number of grants and amounts awarded in various programs:



It is the policy of the University of Nebraska-Lincoln not to discriminate on the basis of gender, age, disability, race, color, religion, marital status, veteran's status, national or ethnic origin or sexual orientation.



Standard Grants — FY 1998:

<i>Research Area/Program</i>	<i>No. of Grants</i>	<i>Total \$ Awarded</i>
Natural Resources/Environment	71	11,268,876
Nutrition, Food Safety, Health	47	6,688,547
Animal Systems	137	20,897,744
Pest Biology & Management	110	13,540,686
Plant Systems	148	18,524,924
Markets, Trade, and Rural Development	38	3,191,518
Enhancing Value and Use	55	7,098,324
Other*	93	6,896,142

Agricultural Research Enhancement Grants — FY 1998:

<i>Type</i>	<i>No. of Grants</i>	<i>Total \$ Awarded</i>
Postdoctoral Fellowships	24	2,125, 586
New Investigator Awards	40	4,966,426
Strengthening Awards		
Research Career Enhancement	9	597,532
Equipment Grants	30	935,593
Seed Grants	38	1,877,367
Standard Strengthening Projects	39	4,959,818

Land-Grant Universities Stimulate Economic Growth

A recent NASULGC study has shown that land-grant universities are powerful engines for economic growth — they generate jobs, increase state tax revenues and encourage new business. Among the significant findings in the report are:

- ❖ Land-grant universities multiply the effect of tax dollars, generating a median average return of \$4 for every state tax dollar invested.
- ❖ Land-grant universities are a major source of jobs, generating a median average of 1.6 jobs in the community or state for every university job held.
- ❖ Spending by university employees, students and visitors has a significant impact on local and state economies. The median spending by employees at land-grant universities is about \$128 million per year; students spend \$106 million; and visitors add another \$11 million.
- ❖ Land-grant universities also generate about \$19 million a year in tax revenue for the states.

Other benefits that states receive from land-grant universities include: fostering new business and creating long-term job growth, promoting innovation in existing businesses, enhancing the work force within the state, improving the quality of life for citizens and enhanced public services.

Barta Brothers Ranch Development

On June 13, 1992, the University of Nebraska Board of Regents authorized IANR to enter into an agreement with James and Clifford Barta and the University of Nebraska Foundation to use the brothers' ranch for research and demonstration projects. On April 27, 1996, the Board of Regents amended the agreement, at the request of the brothers, to permit the University of Nebraska Foundation to assume possession of the ranch. The Barta Brothers Ranch consists of 5,896.7 acres and is located approximately 25 miles south of Long Pine, Nebraska.

The ranch operations are managed by Dennis Bauer as an adjunct to his duties as an extension educator in Brown, Rock and Keya Paha Counties. Business support functions for the ranch operations are coordinated by the ARDC office staff. Daniel Duncan, ARDC director, provides administrative support for the ranch operations.

The main research effort on the ranch is led by Walter Schacht, Agronomy Department, and Jerry Volesky, West Central Research and Extension Center. They will use approximately 3,200 acres of the ranch for two different long-term grazing systems studies starting in 1999. The objectives of their research are: (1) Demonstrate grazing management practices on a large or ranch-scale basis, and (2) Conduct research to determine the long-term effects of these grazing management systems on the botanical composition of rangeland, spread of eastern red cedar, beef cattle performance and production, and wildlife habitat.

In order to implement this research design, approximately \$100,000 has been expended to install pipelines, watering tanks, perimeter fencing and cross fencing. These improvements and the general ranch operations are funded through lease income, grants and contracts. In the future, an endowment fund also will be available for ranch development and research funding.

Terry Klopfenstein, Animal Science, uses approximately 600 acres of the ranch as a summer grazing area for yearlings involved in his grazing systems research. Other research and demonstration projects are being considered by faculty.

A small museum exists at the site and will be expanded in the near future.

Diane says

It is not what you have in your pocket that makes you thankful but what you have in your heart.

Undergraduate Honors Research Program

Funds for the FY 2000 Undergraduate Honors Student Research Program have been allocated to units for support of 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. Twelve proposals were received; nine of these were funded and two proposals are being revised. The following students have received funding:

Ryan Fuchs — Agricultural Economics Researcher: Dr. Ray Supalla <i>"Transfer Methods for Water Rights to Achieve Natural Resource Policy Goals"</i>	\$2,500
Chris Cederberg — Animal Science Researcher: Dr. Jess Minor <i>"Differential Leptin Binding to Uncoupling Protein and Corresponding Effects on Fat Regulation"</i>	\$2,500
Nicole John — Animal Science Researcher: Dr. Dale Van Vleck <i>"Horse Coat Color Genetics"</i>	\$2,500
Jessica Koss — Animal Science Researcher: Dr. Merlyn Nielsen <i>"Evaluation of Milk Production and Energy Utilization in Lactating Mice Divergently Selected for Heat Loss"</i>	\$2,500
Nicholas L. Burns — Biological Systems Engineering Researcher: Dr. Dennis Schulte <i>"Dual Removal of Perchlorate and Nitrates from Ground Water Through Biological Reduction"</i>	\$2,485
Heather M. Root — Biology/Biochemistry Researcher: Dr. Carolyn Price <i>"Utilizing Two Hybrid Analysis to Characterize Telomere Protein Interactions"</i>	\$2,500
Stacy Mortensen — Forestry, Fisheries and Wildlife Researcher: Dr. Ron Johnson <i>"Best Method to Prevent the Germination of Commercial Bird Seed Underneath Bird Feeders"</i>	\$1,046
Salena Revelle — Nutritional Science & Dietetics Researcher: Dr. Marilyn Schnepf <i>"Analysis of the Effectiveness of the Nutrition Education Project (NEP) on Limited Resource Families in Nebraska from 1994 to 1999"</i>	\$2,500
Joel N. Kniep — School of Biological Sciences Researcher: Dr. Jeff Cirillo <i>"Role of Entry Genes in Virulence of Legionella"</i>	\$2,500

Awards From Special Endowments

Ralph H. Bainbridge Memorial Fund

A charitable memorial fund was established at the University of Nebraska Foundation by the Ralph H. Bainbridge Estate. These funds are to be used to support interdisciplinary research teams working in beef production and grassland research and development. One proposal was received and has been funded:

Patrice E. Reece — Panhandle Research and Extension Center
(Walter Schacht, Ranch Lawson, Gary Hein)
"Grazing Effects on the Assemblages of Ants and Other Insect Species in a Sandhills Ecosystem"
Total Amount Funded: \$5,000

Charles B. and Katherine W. Baker Fund

A trust established by Charles E. Baker was liquidated and an endowment was established in the University of Nebraska Foundation. Interest from the endowment is used to support one graduate research assistantship (GRA) in the areas of: (1) soil conservation and management, or (2) breeding and genetics of food and feed grains including germplasm and cultivar development. Three proposals were received and one was funded as follows:

Dean E. Eisenhauer — Biological Systems Engineering
(Thomas G. Franti)
"Hydrolic Modeling for Enhanced Design and Management of Vegetative Filter Strips"
Total Amount Funded: \$12,000

New or Revised Projects

The following station projects were approved recently by the USDA-CSREES and entered in the Current Research Information System:

NEB-11-112 (Biological Systems Engineering) Hydrologic Modeling and Engineering for Enhancement of Vegetative Riparian Buffers
Investigator: Dean E. Eisenhauer
Status: New Hatch project effective March 1, 1999

NEB-12-273 (Agronomy) Selecting Wheat and Other Cereal Grains for Enhanced End-Use Performance Characteristics

Investigator(s): David R. Shelton, P. Stephen Baenziger and Robert A. Graybosch
Status: New Hatch project effective April 1, 1999

NEB-12-274 (Agronomy) Physiological Bases of Environmental Constraints on Plant Growth and Productivity

Investigator: Timothy J. Arkebauer

Status: New Hatch project effective April 1, 1999

NEB-12-275 (Agronomy) Marketing and Delivery of Quality Cereals and Oilseeds

Investigator: David R. Shelton

Status: New Hatch project that contributes to regional research NC-213 effective October 1, 1998

NEB-16-082 (Food Science and Technology) Marketing and Delivery of Quality Cereals and Oilseeds

Investigator: David S. Jackson

Status: New Hatch project that contributes to regional research NC-213 effective October 1, 1998

NEB-16-083 (Food Science and Technology) Marketing and Delivery of Quality Cereals and Oilseeds

Investigator: Lloyd B. Bullerman

Status: New Hatch project that contributes to regional research NC-213 effective October 1, 1998

NEB-21-057 (Plant Pathology) Genetic Variability in the Cyst and Root-Knot Nematodes

Investigator: Thomas O. Powers

Status: Revised Hatch project that contributes to regional research W-186 effective October 1, 1998

NEB-40-002 (School of Natural Resource Sciences) Remediating Organic Contaminants in Soil and Water Through Natural Accelerated Attenuation

Investigator: Steve Comfort

Status: New Hatch project effective January 21, 1999

NEB-40-003 (School of Natural Resource Sciences) Effects of Atrazine on Algal Communities in Aquatic Ecosystems in the Midwest

Investigator: Kyle D. Hoagland

Status: New Hatch project effective February 2, 1999

NEB-43-065 (West Central Research and Extension Center) Integrated Weed Management in Reduced Tillage Systems in Low Rainfall Environments

Investigator: Gail A. Wicks

Status: New Hatch project effective January 1, 1999

NEB-44-056 (Panhandle Research and Extension Center) Taking Advantage of Winter Wheat Protein Premium Through Late-Season Nitrogen Fertilization

Investigator(s): Jurg M. Blumenthal, Dillon M. Feuz and Eric Kerr

Status: New State project effective July 1, 1998

NEB-94-024 (Textiles, Clothing & Design) Impacts of Environmental Disclosure Policies and Constraints on Housing Transaction Practices

Investigator: Shirley Niemeyer

Status: New Hatch project effective April 1, 1999

The Future of Science and Technology*

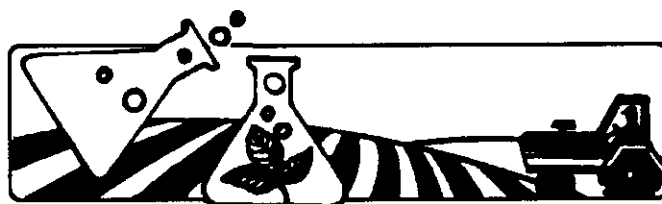
Science and technology are constantly changing as new discoveries are made daily. It is interesting to look back in history to compare the state of science and technology with the present. Listed below are technologies at the cutting edge in 1897 and 1997:

1897	1997
Machine tools	Microelectronics
Firearms	Biotechnology
Clocks	High technology materials
Sewing machines	Information technology
Hardware	Computer controlled tools
Agricultural implements	Robots
Bicycles	High performance aircraft
Steel	Computers
Electrification	Telecommunications
Telegraphy/telephones	

What will be the cutting edge of science and technology in 2027? A few guesses are listed below:

- Nanotechnology
- Biomaterials
- Bioelectronics
- Biocomputing
- Artificial intelligence
- Knowledge management
- Planetary management
- Green power technologies (renewal resources)

* Taken from Michael Crow, AAAS R & D Conference, The Future of Science and Technology in Arizona. 1998.



Grants and Contracts Received April and May, 1999

Agricultural Economics		
Allen, J. and Supalla, R. — USEPA		\$186,940
Allen, J. — USDA/CSREES through University of Missouri-Columbia		31,883
Miscellaneous grants under \$10,000 each		2,900
Agricultural Research and Development Center		
Duncan, D. — Barta Brothers Ranch Fund via UN Foundation		10,000

Agronomy		
Miscellaneous grants under \$10,000 each		26,300
Animal Science		
Klopfenstein, T. — Nebraska Beef Council		25,268
Miscellaneous grants under \$10,000 each		34,785
Biochemistry		
Ragsdale, S. — USDOE		107,000
Ragsdale, S. — NIH		210,416
Miscellaneous grants under \$10,000 each		15,000
Biological Systems Engineering		
Miscellaneous grants under \$10,000 each		500
Biometry		
Eskridge, K. — Nebraska Dept. of Health and Human Services		14,250
Miscellaneous grants under \$10,000 each		5,000
Entomology		
Miscellaneous grants under \$10,000 each		21,750
Family and Consumer Sciences		
Miscellaneous grants under \$10,000 each		1,997
Food Science and Technology		
Miscellaneous grants under \$10,000 each		29,375
Horticulture		
Miscellaneous grants under \$10,000 each		21,066
Northeast Research and Extension Center		
Miscellaneous grants under \$10,000 each		12,900
Panhandle Research and Extension Center		
Baltensperger, D. — Anna Elliott Fund via UN Foundation		23,000
Hein, G. — Anna Elliott Fund via UN Foundation		10,380
Lyon, D. — Anna Elliott Fund via UN Foundation		12,000
Wilson, R. — Anna Elliott Fund via UN Foundation		13,700
Plant Pathology		
Miscellaneous grants under \$10,000 each		30,941
School of Natural Resource Sciences		
Blad, Blaine — Nebraska Game and Parks Commission		32,000
Blad, Blaine — USDA/ARS		240,000
Hergenrader, G. — USDA/FS		46,576
Hu, Steve — USDA/NRCS		41,520
Kuzelka, R. — Nebraska Groundwater Foundation		25,300
Miscellaneous grants under \$10,000 each		4,450
South Central Research and Extension Center		
Miscellaneous grants under \$10,000 each		7,085
Veterinary and Biomedical Sciences		
Duhamel, G. — Ft. Dodge Animal Health		26,700
Moxley, R. — National Pork Producers Council		18,500
Miscellaneous grants under \$10,000 each		26,810
West Central Research and Extension Center		
Johnson, J., Adams, D. and Campbell, J. — Ft. Dodge Animal Health		10,140
Wicks, G. — USDA/FAS		10,000
Miscellaneous grants under \$10,000 each		11,900
Total		\$1,348,332

Proposals Submitted for Federal Grants

The following is a listing of proposals that were submitted after April 1999 by faculty for federal grant programs. While not all grants will be funded, we are appreciative of faculty members' efforts in submitting proposals to the various agencies.

Ruma Banerjee — NIH — H-Tunneling in Methylmalonyl-CoA Mutase — \$107,005

Blair D. Siegfried, Richard L. Hellmich, Thomas E. Hunt and Linda J. Young — USDA/CSREES — Estimating Frequency of Bt Resistance Alleles in Field Populations of the European Corn Borer — \$213,496

Qi "Steve" Hu — USDI/USGS — Application of a Distributed Hydrology-Vegetation Model to the Jacks Fork Basin to Predict Changes in Runoff Due to Climate Change — \$56,290

Andrew K. Benson, Robert Hutkins, Paul Blum, Mark Morrison, Rodney Moxley, Harley Moon, Paul Fey Tom Safranek — USDA/NRICGP — Molecular Epidemiology of Shiga-toxin Producing *E. coli* as a Tool for Risk Factor Analysis — \$1,075,000

David R. Smith — USDA/NRICGP — A Novel Strategy to Test and Monitor Beef Feedlot Food-Safety Control Points — \$999,993

Shelly R. McKee and Mindy M. Brashears — USDA/NRICGP — Impact of Farm Practices and Air Chilling on Pathogen Levels in Poultry — \$599,951

Gail A. Wicks — USDA/FAS/MSD — Use of Reflectance Technology to Identify Weed Competitive Wheat Cultivars — \$30,000

Steve Comfort — USDA/FSA/MSD — Permeable Zero-Valent Iron Barriers for *In-Situ* Containment and Remediation of Pesticides Contamination in Unsaturated Soils — \$3,700

Qi "Steve" Hu — NSF — Effects of Wave-Mean Flow Interaction on Slow-Down of the Walker Circulation in the Equatorial Pacific — \$231,708

Blaine Blad — USDA/ARS — Integrated Nitrogen, Water, and Pesticide Management Systems to Protect Ground Water Quality — \$240,000

Jeffrey D. Cirillo — NIH — Role of Invasion Genes in Virulence of *Legionella* — \$497,759

Stephen Ragsdale — NSF — Biochemistry of the Anaerobic Dehalogenation of Chlorinated Aromatics — \$578,941

1998 Graduate Student Survey

Graduate student data represents enrolled and non-enrolled students for the fall 1998 semester. Only non-enrolled students actively pursuing graduate degrees within the time limit for granting degrees (8 years for a Ph.D. and 6 years for an M.S.) are considered. The graduate program in the Agricultural Research Division (College of Agricultural Sciences and the College of Human Resources and Family Sciences) decreased 6.2 percent from the fall semester 1997 to the fall semester 1998. Forty-six percent are in Ph.D. programs. Forty-three percent of our graduate students are female. Sixty-eight of the graduate students in CASNR majors are supported by assistantships (state-appropriated GRAs and GTAs; grants; fellowships; and international agency or foreign country support). Forty-two percent of the students in the College of Human Resources and Family Sciences are supported.

Major/Unit	M.S.				Ph.D.				Total			
	GRA	GTA	Other ¹	Self	GRA	GTA	Other	Self	95	96	97	98
College of Agricultural Sciences and Natural Resources												
Agricultural Economics	4	0	2	8	4	0	5	10	38	35	35	33
Agricultural Leadership, Education and Communication ²	1	1	1	25	0	1	0	5	12	33	30	34
Agricultural Meteorology ³	—	—	—	—	—	—	—	—	14	12	12	N/A
Agronomy	7	1	21	40	7	0	37	21	143	138	134	134
Animal Science	20	1	21	6	8	0	18	12	79	92	99	86
Biochemistry	1	2	0	1	8	1	13	0	25	20	22	26
Biological Systems Engineering ⁴	2	0	4	8	1	0	7	5	40	41	46	27
Biometry	2	8	2	0	—	—	—	—	14	21	19	12
Entomology	1	0	9	6	5	1	17	0	25	27	33	39
Food Science and Technology	5	0	10	5	12	0	13	1	41	65	44	46
Forestry, Fisheries and Wildlife ³	—	—	—	—	—	—	—	—	46	23	23	N/A
Horticulture ⁵	3	1	6	3	3	0	3	1	16	10	12	20
Horticulture and Forestry	—	—	—	—	—	—	—	—	—	19	14	N/A
Mechanized Systems Management	1	1	1	5	—	—	—	—	8	8	7	8
Plant Pathology ⁶	1	0	1	2	5	0	5	0	16	16	15	14
School of Natural Resource Sciences ⁷	3	1	9	3	2	1	4	0	N/A	N/A	N/A	23
Veterinary and Biomedical Sciences ⁸	2	0	4	3	6	0	20	1	43	38	31	36
Total	53	16	91	115	61	4	142	56	560	598	576	538
College of Human Resources and Family Sciences												
Family and Consumer Sciences	3.5	10.5 ⁹	1	21	—	—	—	—	31	25	26	36
Nutritional Science and Dietetics	2	8	6	8	—	—	—	—	53	42	32	24
Textiles, Clothing and Design —MS	0	3	1	4	—	—	—	—	5	6	3	8
—MA	0	0	0	0	—	—	—	—	4	2	4	0
Interdepartmental Nutrition	2	0	1	4	5	1	0	7	9	11	10	20
Interdepartmental Human Resources and Family Sciences	0	0	0	9	2.5	1.5 ⁸	1	15	65	78	48	29
Total	7.5	21.5	9	46	7.5	2.5	1	22	167	164	123	117
Grand Total	60.5	37.5	100	161	68.5	6.5	143	78	727	762	699	655

(1) = Other - grant support, international agency or foreign country support, fellowships

(2) = Ph.D. students obtain degrees in Teachers College

(3) = The Departments of Agricultural Meteorology and Forestry, Fisheries and Wildlife formed the School of Natural Resource Sciences in August 1997.

(4) = Engineering degrees are offered through the College of Engineering and Technology

(5) = The Ph.D. program is in the Horticulture and Forestry major. This is the first year to list the Ph.D. students in the department.

(6) = Degrees obtained through the School of Biological Sciences

(7) = This is the first year to report data for the School of Natural Resource Sciences. The Ph.D. program is in the Horticulture and Forestry major, or other departments.

(8) = Ph.D. degrees are offered through UNMC

(9) = GTA's in the College of Human Resources and Family Sciences are funded through Academic Affairs.