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ARD
Agricultural Research Division News
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February 2005 Volume 38, Number 1

Comments from the Dean

Dear Colleagues:

Since the beginning of the second semester, ARD staff have completed publication and distribution of the 118th Annual Report for the Agricultural Research Division. A number of interesting facts are presented in the report. For example, 309 faculty have research appointments but the ARD budget provides only 126.5 faculty FTE. Obviously, most of the difference represents FTE provided by CED, CASNR and CEHS. However, ARD has an increasing number of FTE associated with research faculty who are paid from other than state-appropriated funds.

During FY 2004, expenditures on ARD projects totaled $74.1 million. Of this total, federal formula, state-appropriated, Nebraska Research Initiative, grants and contracts, and product sales represented 4.7 percent, 41.5 percent, 4.6 percent, 36.2 percent and 13 percent, respectively. Expenditures per budgeted research FTE were $585,432. Expenditures for salaries and benefits, supplies and expenses, travel and equipment represented 63.5 percent, 30.4 percent, 2.2 percent and 3.9 percent of the total, respectively. During FY 2004, ARD faculty obtained $42.3 million in research grants and contracts.

ARD faculty published 304 refereed journal articles, three research bulletins and 69 books and book chapters during calendar year 2003. In addition, faculty served as advisers for 120 M.S. theses and Ph.D. dissertations during 2003, obtained two patents and released 15 unique cultivars or germplasms. ARD faculty also hosted 54 visiting scientists and 47 post-doctoral research associates during 2003.

These statistics provide evidence of the productivity and accomplishments of ARD faculty. During my tenure as Dean for Agricultural Research, continued improvement has occurred in all the metrics that normally define the success of a research program. I express sincere congratulations and thanks to all of the faculty, staff and students who contribute to the ARD research project accomplishments. Best wishes for continued success.

Darrell W. Nelson
Dean and Director
Agricultural Research Division

New Additions to the ARD Web Site

In January, you may have noticed some new additions to the ARD Web site. These were added to inform our public, students (both graduate and undergraduate), and faculty/staff of awards, grants and program opportunities. The new material will also aid faculty/staff in their research project development. Below is a brief outline of the new additions:

- Awards and program opportunities for students can be found under the "Program" menu. A menu option for both undergraduate and graduate students has been added. A brief description of each award and program is outlined. Application forms have been created in form-ready format so that applicants can type directly onto the form. These files can be retrieved in Microsoft Word and Adobe Acrobat formats. (Please note that these files are password protected and have been created to allow direct typing into the specified form fields.)

The biggest change to the Web site is found under the "For ARD Scientist and Staff" menu option. Under this menu option, ARD's faculty/staff can find information regarding ARD's guidelines, forms, project development and policies.

- Grants and awards information, guidelines and forms can be found under the "ARD Guidelines and Forms for Faculty/Staff" menu.

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- The menu "Project Development" provides instructions, guidelines and forms to aid faculty/staff in the development of their research projects.
- The form files found under these menu options can be retrieved in Microsoft Word, Excel or Adobe Acrobat. (Please note that these files are password protected and have been created to allow direct typing into the specified form fields.)
- For information on various ARD policies, look under the "ARD Policies" menu option.

In addition to this new content, the overall appearance of the Web site will undergo a substantial change in the next few months. The ARD Web site is at: http://www.ard.unl.edu.

Recommendations for Controlling Biological, Chemical and Radiological Materials at Land Grant Universities

In the fall of 2002, the University of Nebraska-Lincoln was visited by a team from the USDA Office of the Inspector General to ascertain if research projects funded in part by CSREES were appropriately handling hazardous biological, chemical and radiological materials. A number of other land grant universities were also visited. Based on the findings from these visits, the Office of the Inspector General authored a report that contains a number of recommendations regarding the security and safe use of hazardous chemicals, biological agents and toxins. A listing of these recommendations is given below:

- Recommend to the Department of Homeland Security and the Executive Office of the President, Homeland Security Council, that federal standards include directions that all government-funded research institutions compile a summary inventory of hazardous chemicals and biological agents and toxins located at their facility. The inventory record should be maintained in a secure location where institution officials can readily access it.
- Recommend to the Department of Homeland Security and the Office of the President, Homeland Security Council, that federal standards include directions that all government-funded research institutions use the inventories of biological agents, chemicals and licensing requirements for radioactive materials to assess the risks associated with these materials and determine the commensurate security level for them.
- Recommend to the Department of Homeland Security and the Executive Office of the President, Homeland Security Council, that federal standards include direction that all government-funded research institutions establish and implement procedures for reporting stolen or missing pathogens in compliance with the Public Health Security and Bioterrorism Preparedness and Response Act of 2002.
- Recommend to the Department of Homeland Security and the Executive Office of the President, Homeland Security Council, that federal standards include a requirement that all government-funded research institutions have procedures to ensure that appropriate background checks are performed for all individuals having access to CDC and APHIS listed agents and toxins.
- Direct the Cooperative State Research, Education and Extension Service (CSREES) to issue a letter to all institutions engaged in USDA-funded research suggesting that they immediately (1) identify all freezers at their institutions used to store biological agents, (2) take a complete and thorough inventory of the contents of these freezers, (3) destroy any pathogens identified in the freezers that are no longer needed for valid research purposes or can no longer be identified and (4) report to CDC and APHIS any pathogens found in the freezers not already reported.
- Recommend to the Department of Homeland Security and the Executive Office of the President, Homeland Security Council, that federal standards include a requirement for laboratories to develop inventory control procedures.
- Recommend to the Department of Homeland Security and the Executive Office of the President, Homeland Security Council, that federal standards include a requirement that institutions establish uniform policies and procedures for ensuring disposal of biological agents when researchers responsible for those agents leave the institution.
- Direct CSREES, ARS, FSIS and FS to use USDA's Department Manual as a basis for providing technical guidance regarding security of USDA-listed agents and toxins to funded institutions.
- Direct CSREES to survey grant institutions for their best practices involving security of research facilities and laboratories and to share this survey with all grantees as a basis for establishing biosecurity standards throughout the research community.
- Until federal security standards have been developed, direct CSREES to incorporate requirements into its policies and grant

agreements and processes that institutions receiving USDA research funding should follow all laws, regulations and guidance regarding biosecurity governed by CDC and APHIS. Other agencies such as ARS, FSIS and FS also should be directed to incorporate the requirements into their policies and cooperative agreements.

How to Have a Successful Visit to a Funding Agency

The material below was prepared by Vice Chancellor Prem Paul as a guide for a successful visit to a funding agency. In my view, this represents very sound advice. The Office of the Vice Chancellor for Research periodically arranges trips to federal agencies by groups of faculty. Alternatively, individual faculty members may decide to make a visit to a funding agency. Please recall that the Office of the Vice Chancellor for Research provides competitive funding for visits to federal funding agencies.

The importance of visiting funding agencies and learning about their priorities cannot be overstated, but a visit will only be successful if you have done the necessary groundwork before you visit and if you follow up on what you have learned after the visit.

The goals of a visit are not only to learn about what the agency can offer you — possible funding opportunities — but also for the agency to learn what you can offer them — your expertise. Important outcomes of a visit might include invitations to serve on a proposal review panel, committee or task force. These are very valuable opportunities and you should take advantage of them, if at all possible.

Pre-visit Preparation

1. Background research to understand the agency's funding priorities
   - Thorough search of the agency's Web site for program announcements, "dear colleague letters," special reports of symposia, workshops and task forces.
   - Web site search of National Academy of Sciences, National Research Council, and White House Office of Science and Technology Policy for reports that foreshadow shifts in research priorities and important new initiatives.
2. Prepare a summary of research interests
   - Half-page to one page descriptive CV **or** a CV in the format of the funding agency, i.e., NSF or NIH biosketch.
   - List of key publications (maximum one page); these should be matched to the program you are targeting and may vary with different programs.
   - List of key funded projects.
3. Prepare one month in advance a two-page white paper on proposed research project/s that includes:
   - Title
   - Overall goal
   - Outline of the problem to be addressed
   - Gaps in the current research
   - Questions the proposed research will address
   - Potential impacts/outcomes
4. Select appropriate program officers, arrange for visit and share your white paper with them at least one week in advance of the visit.
   - Contact multiple agencies and multiple programs within agencies to determine the best fit and greatest interest.

Meeting with Program Officers

1. Be prepared to give a brief, concise description of your research interests. The program officer will have your white paper, so you don't need to reiterate all of that information.
2. Give the program officers ample time to comment on your research and to explain their programs. That is why you are there — to get their ideas. LISTEN CAREFULLY and take notes.
3. Leave your business card with the program officer.
4. Review and summarize your notes as soon as possible after the meeting.
5. Prepare a summary report of the visit and submit a copy to the Vice Chancellor for Research.
   - Agency you visited, name of the program and program officers contacted
   - Brief overview of what you learned
   - Outcomes funding opportunities, review panels/committees
6. Send a thank you note to each program officer/contact person. Continue to communicate with interested program officers as appropriate.
7. Respond positively to any offers from the program offices to serve on review panels, committees or task forces. These are important outcomes of your visit.

Crop Variety Release Committee Assignments

We have recently updated the membership of the Crop Variety Release Committees. The assignments are on the next page. We want to thank faculty members for agreeing to serve on these committees.

In addition, we want to remind faculty that all plant materials, including varieties licensed through the Office of Technology Development (OTD), must be

peer reviewed and formally released by the Nebraska Agricultural Experiment Station. You may work with OTD on disclosures at the same time, but licensing agreements cannot be finalized until the material has been formally released. If you have any questions about this process, please feel free to contact the appropriate Variety Release Committee Chair, Dan Duncan or Jeff Noel.

Committee Memberships:

Corn, Sorghum and Millet Committee

David Baltensperger, Chair
Lenis Nelson, Secretary
Nora D'Croz-Mason
Ismail Dweikat
John Foster
Steve Mason
James Partridge
Jeff Pedersen
Ken Russell

Ex-Officios: Jeff Noel, Foundation Seed Director
Lowell Moser, Agronomy and Horticulture Interim Department Head
Steven Knox, NCIA Secretary Manager

Vegetable Crops, Turf, Ornamental and Woody Crops Committee

Bob Shearman, Chair
Dale Lindgren
Terry Riordan
James Steadman
Carlos Urrea
Alex Pavlista
Ellen Paparozzi
Fred Baxendale
Jim Locklear

Ex-Officios: Jeff Noel, Foundation Seed Director
Lowell Moser, Agronomy and Horticulture Interim Department Head

Oil Seeds and Miscellaneous Crops Committee

James Specht, Chair
George Graef
Leon Higley
Loren Giesler
Lenis Nelson, Secretary
Paul Staswick
Tom Clemente

Ex-Officios: Jeff Noel, Foundation Seed Director
Lowell Moser, Agronomy and Horticulture Interim Department Head
Steven Knox, NCIA Secretary Manager

Cereal Crops Committee

Steve Baenziger, Chair
Lenis Nelson, Secretary
David Baltensperger
John Foster
Gary Hein
Bob Klein
John Watkins
Robert Graybosch

Ex-Officios: Jeff Noel, Foundation Seed Director
Lowell Moser, Agronomy and Horticulture Interim Department Head
Steven Knox, NCIA Secretary Manager

Forage Crops Committee

Ken Vogel, Chair
Bruce Anderson, Secretary
Steve Danielson
Jerry Volesky
John Watkins
Walter Schacht
James Stubbendieck

Ex-Officios: Jeff Noel, Foundation Seed Director
Lowell Moser, Agronomy and Horticulture Interim Department Head
Steven Knox, NCIA Secretary Manager

118th ARD Annual Report

The 118th Annual Report for the Agricultural Research Division was recently published. Although this report is required by legislation establishing the Nebraska Agricultural Experiment Station on March 31, 1887, it is published primarily as a means to communicate faculty research accomplishments to key decision makers. The publication also serves as a historical record of faculty accomplishments, active projects, faculty and graduate student recognition, and outputs from the research program.

The annual report is sent to wide range of people including the Governor, members of the Nebraska Legislature, the Nebraska Congressional Delegation, University of Nebraska Board of Regents, NU and UNL administrators, state agency directors, USDA officials, ARS collaborators, experiment station directors in other states, and selected IANR clientele. This report may be accessed at http://www.ard.unl.edu/report.html.

Endeavors

For a number of years, Vicki Miller has written and coordinated printing of **Endeavors,** the primary accomplishment reporting publication of the Agricultural Research Division. **Endeavors** provides short reports of significant findings from ARD faculty research projects. Each year, this eight-page document highlights the accomplishments of 25 to 30 research projects. The 2004-2005 publication features a broad range of research from alternative crops to the impacts of consolidation in the food processing industry.

Endeavors is the principal publication provided to members of the Nebraska Legislature to report on the impacts of Nebraska's investment in agricultural research. Likewise, we use the publication in our meetings with the Nebraska Congressional Delegation and their staffs. It also has been used as the basis for discussions with IANR clientele and support groups. Copies are available for use by unit administrators and faculty in their meetings with unit external advisory committees or other clientele groups. Please contact the ARD office if you would like copies.

Fall 2004 Graduate Census

Graduate student data represents students enrolled on the sixth-day census (Fall 2004) and non-enrolled students actively pursuing graduate degrees. The graduate program in the Agricultural Research Division (College of Agricultural Sciences and Natural Resources and the College of Education and Human Sciences) increased 2.6 percent from the fall semester 2003 to the fall semester 2004. Fifty-two percent of the graduate students in CASNR majors are supported by assistantships (state-appropriated GRA and GTA; grants; fellowships; and international agency or foreign country support). Thirty-seven percent of the students in the College of Education and Human Sciences are supported. Thirty-two percent of our graduate students were not enrolled in IANR graduate majors on the sixth day of the semester.

	Institute of Agriculture and Natural Resources													
	M.S.				*Ph.D.*									
Major/Unit	*GRA*	*GTA*	*Other*	*Self*	*GRA*	*GTA*	*Other*	*Self*	*2000*	*2001*	*2002*	*2003*	*2004*	*03-04 % chg*
College of Agricultural Sciences and Natural Resources														
Agricultural Economics	16	0	1	7	5.5	1.5	0	2	36	37	35.5	36	33	-8.3%
Ag. Leadership, Education and Comm.	0	3.5	5.5	47	1	3	1	21	46	63	84	86.5	82	-5.2%
Agronomy	5.5	0	11.5	19.5	7	0	15.5	10	98	82.5	75	80.5	69	-14.3%
Animal Science	6	1	10.5	0	11	0	10	8	87	85.5	79	72.5	46.5	-35.9%
Biochemistry	0	0	0.5	0	0	2	33	0.5	28	36	33	31	36	16.1%
Biological Systems Engineering	6	0	5.5	2	0	0	6.5	0	30.5	30	21	26	20	-30.0%
Entomology	0.5	0	16.5	81	3.5	1	10.5	3	75	95	94	108	116	7.4%
Food Science and Technology	4	0	8	8	8	0	2.5	3	48	43.5	41	33	33.5	1.5%
Horticulture	1	0	5	4	0	0	1	1.5	19	12	15.5	14	12.5	-10.7%
Master of Agriculture	0	0	0	23	NA	NA	NA	NA	NA	NA	10	8	23	187.5%
Mechanized Systems Management	1	1	1	0	NA	NA	NA	NA	7	5	6	4	3	-25.0%
Plant Pathology	0	0	1	3	7.5	1	2.5	1	16	9	12	16	16	0.0%
School of Natural Resources (MA/MS)	4.5	0.5	21.5	18	5	0.5	8.5	14	64.5	57.5	88	73	72.5	-0.7%
Statistics	2	11	2	15	0	5	4	4	17	15	30.5	37.5	43	14.7%
Veterinary and Biomedical Sciences	2	0	3	8	4	0	9	0	33	40	31.5	30	26	-13.3%
Total	48.5	17	92.5	235.5	52.5	14	104	68	605	611	656	656	632	-3.7%
Grand Total	**393.5**				**238.5**				**605**	**611**	**656**	**656**	**632**	**-3.7%**
College of Education and Human Sciences														
Family and Consumer Sciences	9.5	0	7.5	37	2	0	4	10	40	36	43	42	70	66.7%
Nutrition and Health Sciences	4	7	9	19	4	0	0	1	32	36	39	28	44	57.1%
Textiles, Clothing and Design (MA /MS)	1	4.5	2.5	17	1	0	1	5	12	23	26	25	32	28.0%
Interdepartmental Nutrition	1	0	1	0	3	0	0	1	13	12	15	16	6	-62.5%
Interdepartmental CEHS	0	0	0	13	2	1	3	15	52	52	34	30	34	13.3%
Total	15.5	11.5	20	86	12	1	8	32	149	159	157	141	186	31.9%
Grand Total	**133**				**53**				**149**	**159**	**157**	**141**	**186**	**31.9%**
Grand Total CASNR and CEHS	**64**	**28.5**	**112.5**	**321.5**	**64.5**	**15**	**112**	**100**	**754**	**770**	**813**	**797**	**818**	**2.6%**

New or Revised Projects — December 2004

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

NEB 33-004, Nitrogen cycling, loading and use efficiency in forage-based livestock production systems
(Contributing to Multistate Committee, NC-1021)
Investigators: Walter Schacht and Terry Klopfenstein
Status: Effective Oct. 1, 2004 through Sept. 30, 2007

NEB 40-034, Characterization of land cover for improved numerical weather prediction modeling
Investigators: James Merchant and Geoffrey Henebry
Status: Hatch project effective Sept. 15, 2004 through Sept. 14, 2009

NEB 29-013, Post award management of biomass R&D initiative projects
Investigators: Milford Hanna and Loren Isom
Status: USDA-CSREES grant effective Sept. 15, 2004 through Sept. 15, 2005

Proposals Submitted for Federal Grants — December 2004

The following is a listing of proposals that were submitted during December 2004 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.

Milford Hanna — Industrial Ag Products Center — Multiscale modeling and experimental verification of expansion of corn starch during extrusion — $137,108 (Through University of Idaho)

Milford Hanna and **Lloyd Bullerman** — Industrial Ag Products Center — Chemical and toxicological evaluation of Fumonisin B1 in extruded corn grits — $102,910

Clayton Kelling — Veterinary and Biomedical Sciences — Reverse genetics approach to functional analyses of bovine respiratory syncytial virus fusion protein glycosylation — $345,570

Andrea Cupp — Animal Science — Role of VEGF isoforms and hyaluronan on ovulation in the bovine — $399,647

Brigitte Tenhumberg and **Svata Louda** — School of Natural Resources — Collaborative Research: QEIB, role of insect herbivory in community resistance to invasion by bull thistle — $403,453

Jeyamkondan Subbiah, Chris Calkins, and **Ashok Samal** — Biological Systems Engineering — Hyperspectral imaging to predict beef tenderness — $494,570

James Alfano — Plant Pathology — Secretion signals and type III chaperones in the Pseudonmonas syringae type III secretion system — $375,476

Anatoly Gitelson and **Geoffrey Henebry** — School of Natural Resources — Baseline data set of *in situ* meteorological observations for North America and Northern Eurasia for extreme event studies: Long-term and near-real time — $328,697

Brigitte Tenhumberg and **Svata Louda** — School of Natural Resources — Collaborative Research: QEIB: Role of insect herbivory in community resistance to invasion by bull thistle — $403,454

Andrew Benson — Food Science and Technology — Functional consequences of genome evolution in Listeria monocytogenes — $261,515

Dennis Schulte, David Jones, and **Ann Koopmann** — Biological Systems Engineering — Assessing science, technology, engineering and mathematics learning by college students in Out of Class experiences at informal learning sites — $498,726

Anatoly Gitelson and **Donald Rundquist** — School of Natural Resources — Responses of coastal waters to terrestrial inputs of elemental CNP in urbanizing coastal regions — $290,248

Steven Comfort — School of Natural Resources — Field-scale demonstrations of innovative remediation techniques for contaminated soil and water — $994,100

Mary Beck — Animal Science — Neural plasticity and behavior: A new approach to assessing hen welfare — $349,742

Dean Eisenhauer, C. William Zanner, and **Scott Hygnstrom** — Biological Systems Engineering — Beaver in agricultural watersheds: potential for mitigating degraded midwestern streams — $10,000

R. Matthew Joeckel — School of Natural Resources — Stream sediment and soil samples collection in Nebraska — $20,000

Kyle Hoagland and **Sherilyn Fritz** — School of Natural Resources — Solving complex issues in Nebraska: modeling the Western Platte River Valley — $175,000

Geoffrey Henebry — School of Natural Resources — Evaluating the effects of institutional change on regional hydrometeorology: assessing the vulnerability of the Eurasian semi-arid grain belt — $599,720

F. Edwin Harvey — School of Natural Resources — Human waste indicators in Rocky Mountain National Park Streams — $162,019

Steven Harris — Plant Science Initiative — Germination-related morphogenesis in fusarium graminearum — $337,450

Jeffrey Cirillo — Veterinary and Biomedical Sciences — Entry mechanisms of mycobacterium marinum — $292,000

Chen Xun-Hong — School of Natural Resources — Quantification of stream-aquifer connection and its implication for modeling surface water-groundwater interactions — $19,955

Rhae Drijber — Agronomy and Horticulture — Vulnerability of soil organic matter to temperature changes: exploring constraints due to substrate decomposability and microbial community structure — $21,599

Grants and Contracts Received for December 2004

Agronomy and Horticulture	
George Graef — United Soybean Board	$67,688
Robert Shearman — Todd Valley Farms, Inc	12,000
Miscellaneous grants under $10,000 each	19,800
Agricultural Research Division	
Miscellaneous grants under $10,000 each	7,000
Biochemistry	
Miscellaneous grants under $10,000 each	600
Biological Systems Engineering	
Jeyamkondan Subbiah — Research Council	20,000
Entomology	
John Foster — Pioneer Hi-Bred International, Inc	12,500
Miscellaneous grants under $10,000 each	4,300
Food Science and Technology	
Susan Hefle — National Peanut Board	15,000
Randy Wehling — Mussehl Poultry Endowment	14,900
Harshavardhan Thippareddi — Research Council	20,000
Miscellaneous grants under $10,000 each	1,403
Northeast Research and Extension Center	
Michael Brumm — Iowa State U — National Pork Board	13,000
Michael Brumm — NE Pork Producers Assoc.	12,400
Miscellaneous grants under $10,000 each	12,575
Panhandle Research and Extension Center	
Miscellaneous grants under $10,000 each	33,115
Plant Pathology	
Loren Giesler (subcontracted with Univ. of Illinois) — USDA/CSREES	15,000
School of Natural Resources	
James Merchant and Patti Dappen — U.S. Dept. of Interior Bureau of Reclamation	30,877
Veterinary and Biomedical Sciences	
David Steffen — NE Dept of Ag	60,000
Miscellaneous grants under $10,000 each	6,000
West Central Research and Extension Center	
Robert Klein and Lindgren, Dale — Nebraska Dry Bean Commission	9,600
Miscellaneous grants under $10,000 each	7,030
Total	**$394,788**