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Agricultural Research Division News

The Institute of Agriculture and Natural Resources

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University of Nebraska-Lincoln

September 1992

Volume 27, Number 2

COMMENTS FROM THE DEAN

Dear Colleagues:

The start of the new academic year has brought some organizational changes to ARD. As you may recall, during the past six months we have been attempting to identify a part-time coordinator for the North Central Region Sustainable Agriculture Research and Education (SARE) Program. Nebraska is the host institution for this program in the North Central Region. We were unsuccessful in identifying a faculty member who was both interested in the position and acceptable to the Regional SARE Administrative Council. At the same time, Dean Edwards was attempting to hire a part-time Assistant Dean to coordinate outreach activities. After considerable discussion, the IANR Administrative Council suggested that one full-time position be created to fill both of these needs. We have hired Dr. Steve Waller to fill this new position on a temporary basis. Within a few weeks, we will advertise to fill the position on a permanent basis.

This change suggests that it may be appropriate to review the administrative assignments in ARD.

Darrell Nelson (1.0 FTE) has primary responsibility for administrative liaison within and outside of IANR, public relations, management of research personnel and budgets, comprehensive reviews, ARD News editing, variety and germplasm releases, administration of some internal grant and recognition programs, input coordination for **Research Nebraska**, project system management, federal reporting, personnel evaluation, and promotion and tenure decisions.

Dale Vanderholm (0.85 FTE) has primary responsibility for regional research allocations, equipment fund allocations, review of contracts, patent and copyright administration, liaison to commodity boards, coordination of commodity board proposals, administration of some internal grant programs, project reviews, and general administration. Dale also serves as the IANR Facilities Director on a 0.15 FTE basis.

Steve Waller (0.15 FTE) has temporary responsibility for the ARD Annual Report, project reviews, Chair of the Natural Resources Council, facilitator of the Grain Sorghum Working Group, coordinator of the group developing the Center for Grassland Studies, and special projects to enhance visibility of research programs. Steve has 0.35 FTE assigned as the Coordinator of the North Central SARE Program. This federal program pays 35% of his salary and fringe benefits and provides the salaries of support staff for the program.

Jeff Keown is serving as an Administrative Intern in ARD during this fiscal year as a part of his participation in the SAES Leadership Development Course. He spends about 10 percent of his time in our office conducting project reviews, undertaking special projects, and learning about research administration.

Tom Johnson is the IANR Facilities Coordinator. Although he is housed in ARD, Tom is not a part of the ARD staff, but works with Dale Vanderholm in IANR facilities administration. He provides facilities planning support to all IANR components and is a part of the Vice Chancellor's staff.

Darrell Nelson
Dean and Director

RECOVERY OF INDIRECT COSTS ON RESEARCH GRANTS

Although our indirect cost rate on research projects exceeds 40% of modified total direct costs, the actual recovery of indirect costs on ARD grants is very low (see table below). This low rate of indirect cost recovery arises in part from constraints imposed on indirect costs rates in some USDA grant programs, the reluctance of some state agencies and companies to pay indirect costs, and the hesitancy of some faculty to address the need for indirect cost recovery when discussing research projects with potential sponsors. Every research activity has both direct and indirect costs. Collectively, we need to do a better job of recovering indirect costs to improve our research support services and to provide research enhancement funds for units.

	% Indirect Cost Recovered		
College/Division	FY 1990	FY1991	FY 1992
Ag Research Div	11	9	8
Cons & Surv Div	11	27	30
Arts & Sciences	30	25	27
Engineering & Tech	27	16	18

The Agricultural Research Division provides information and educational programs to all people without regard to race, color, national origin, sex or handicap.

Listed below are the amounts of indirect cost funds recovered on grant-funded research projects by IANR units during FY 1992. There is tremendous variation between units. Approximately 20% of the recovered indirect costs will be returned to the units that generated the funds.

Unit	Indirect Cost Recovered, $
Ag Economics	0
Biol Systems Engineering	0
Agronomy	117,819
Ag Meteorology	99,220
Animal Science	57,985
Biochemistry	194,265
Entomology	10,720
Food Science & Tech	0
Forestry	40,103
Horticulture	31,151
Industrial Ag Products Center	793
Northeast R & E Center	0
Human Nutrition	2,650
Plant Pathology	90,304
Panhandle R & E Center	0
South Central R & E Center	0
Textiles, Clothing & Design	2,734
Veterinary Science	77,302
Water Center	34,352
West Central R & E Center	0
ARD Total	759,399

NSF RESEARCH RANKINGS FOR UNL - FY 1990

Each year NSF carries out a survey of research expenditures by all major universities. FY 1990 is last year for which complete data is available. Listed below are the national rankings and funds expended for various categories of research at UNL.

Category	Ranking	$ x 1,000
Total research	71	77,593
Non-fed. funded research	36	54,912
Federally funded research	106	22,686
Industry funded research	104	3,394
Agricultural research	5	45,945
Engineering research	65	9,709
Physical science research	88	4,642
Chemistry research	78	2,658
Environmental science research	72	2,996
Life science research	61	55,349
Biological science research	>100	----
Social science research	75	2,774

FY 1993 CSRS BUDGET

As suggested in the last issue of ARD News, the FY 1993 CSRS budget is almost a duplicate of the FY 1992 budget (see below). We regret that there were no increases in formula funds, NRI, or the competitive programs in the Special Grants. All researchers will lose purchasing power as a result of this budget due to inflation. We were pleased that the Nebraska Congressional delegation was able provide five designated Special Grants to support some of our high priority programs.

FY 1993 CSRS BUDGET

Program	FY 1992	FY 1993
	- - - - $, thousands - - - -	
Base Funds:		
Hatch Act	168,785	168,785
McIntire-Stennis	18,533	18,533
Animal Health	5,551	5,551
National Research Initiative	97,500	97,500
Special Grants:		
Aquaculture Research	316	316
Global Change	2,000	2,000
Integrated Pest Mgmt	4,457	4,457
Minor Use Animal Drugs	464	464
Nat. Biol. Impact Assess.	300	300
Pesticide Clearance	3,500	3,500
Pesticide Impact Assess.	2,968	2,968
Rural Development Centers	500	500
Tropical & Subtropical Res.	3,320	3,320
Water Quality	9,000	8,950
Nebraska Specific Grants:		
Food Processing Center	50	50
Non-food Ag Products	110	110
Rural Policies Institute *	525	692
Rural Housing Needs	0	80
Sustainable Ag Systems	70	70
Other Research Programs:		
Aquaculture Centers	4,000	4,000
Sustainable Agriculture	6,725	6,725
Supplemental & Alter. Crops	1,168	1,168
State Ag Weather Information	400	400
Rangeland Research	475	475
Critical Materials	400	400

*In partnership with the Universities of Missouri and Arkansas.

COMPARISON OF NC REGIONAL AES PROGRAMS

Listed below are selected characteristics for the nine largest state agricultural experiment stations in the North Central Region. The Agricultural Research Division's program is about average in scientist years (SYs), total research funds expended, and dollars expended per SY. We are below the average in number of projects, but significantly above average in dollars expended per project and scientist years assigned per project. The last indicator is quite interesting because it shows that all experiment stations are requiring each faculty member with a research appointment to provide leadership for at least one project.

State	No. of Projs.	SYs	Funds, $	$/Proj.	$/SY	SY/Proj.
		------$ x 1,000 ------				
Illinois	338	168	34,556	102.2	205.8	0.50
Indiana	349	132	46,584	133.5	352.9	0.38
Iowa	390	146	54,920	140.8	375.9	0.37
Kansas	382	176	39,376	103.1	223.3	0.46
Michigan	465	151	55,468	119.3	367.6	0.32
Minnesota	399	190	55,219	138.4	291.2	0.48
Nebraska	320	154	46,712	146.0	303.1	0.48
Ohio	410	141	36,914	90.0	262.7	0.34
Wisconsin	531	174	61,242	115.3	352.4	0.33
Average	398	159	47,888	121.0	303.9	0.41

FACTS ABOUT THE U.S. AND JAPAN'S FOOD AND AGRICULTURE INDUSTRIES

- Foreign entities owned 14.8 million acres of U.S. agricultural land as of December 31, 1991. These holdings represent about 1.2% of privately-owned land in the U.S.
- Foreign entities owned 76,251 acres of agricultural land in Nebraska on December 31, 1991. This amount represents about 0.2% of land in the state.
- The average Japanese consumes food containing 2,630 Kcal of energy per day, whereas the average American has a daily energy intake of 3,644 Kcal.
- Japan's food imports represent 14.9% of total imports, whereas U.S. food imports are only 5.5% of total imports.
- Japan's major food imports are meats, fish, cereals, vegetables & fruits, and tobacco.
- The major food imports into the U.S. are meat, fish, vegetables & fruit, fancy foods, and beverages.
- Japan is self-sufficient in rice but imports large amounts of corn and beans.
- Japan has a total farming population of 4.2 million people living on 13.1 million acres of agricultural land. This results in an average of 3.2 acres per person engaged in agricultural production. In contrast, the average person in the U.S. living on a farm or ranch is responsible for 359 acres.

RETURNS ON INVESTMENT FOR AG RESEARCH

Each year the USDA and state agricultural experiment stations spend about $2.5 billion on agricultural research. These expenditures have traditionally been considered to be investments in future productivity and income growth. Given the current interest in accountability for expenditures of public funds it is increasingly important to have a good estimate of the rate of return on research investments. Studies conducted during the last 30 years have demonstrated that the annual rate of return from research investments are in the range of 20 to 60%, much higher than most other conventional investments.

A recent sophisticated study (Norton and Ortiz, 1992) of return on investment in agricultural research has provided good evidence that taxpayers are well rewarded for supporting production research. Listed below is a summary of the studies' findings:

Commodity Group	Marginal Product, $[1]	Rate of Return, %
All agriculture	4.9	30
Cash grains	5.2	31
Vegetables	2.7	19
Other field crops	4.8	34
Poultry	6.7	46
Other livestock	10.5	55

[1] Marginal product is the effect on output of a $1 increase in research expenditures, i.e., $1 more research investment in poultry research would yield $6.70 in additional value of output over several years.

Reference: Norton, G. W. and J. Ortiz. 1992. Reaping the Return to Research. Journal of Production Agriculture 5:203-209.

REPORT ON THE NATIONAL RESEARCH INITIATIVE FOR FISCAL YEAR 1991

During FY1991, the National Research Initiative program attracted 2,713 proposals requesting $636,828,000 in funding. Twenty four peer panels reviewed and ranked the proposals. Funding was available to support 590 proposals totaling $69,204,000. The success rate was 22% and the average funding level for a project was $52,591 per year.

Listed below are summaries of funding provided in various program areas, type of research, and amount of disciplinary involvement:

Program Area:	
Natural Resources	19.2%
Nutrition & Food Safety	5.5%
Animal Systems	27.4%
Plant Systems	47.9%
Type of Research:	
Fundamental Research	73.7%
Mission-Oriented Research	26.3%
Disciplinary Involvement:	
Multi-disciplinary Research	28.2%
Single Discipline Research	71.8%

A number of cross-cutting issues such as plant genome mapping, forest biology, global change, sustainable agriculture, animal genome mapping, animal health, and water quality were addressed as part of the funding provided under the four general program areas.

In addition, about 11% of total funding was provided as strengthening awards to individual post-doctoral investigators, new investigators, and scientists at small and mid-sized institutions. About 11% of funding went as grants to investigators who reside in states designated as receiving the least amount of federal research funds (EPSCoR states). Approximately 72% of total funding was provided to land-grant institutions.

ARMY CORPS OF ENGINEERS INVESTIGATION AT THE ARDC

The Army Corps of Engineers has been, and is continuing, to investigate issues related to Department of Defense operations at the former Nebraska Ordinance Plant, most of which is now the Agricultural Research and Development Center. The investigations have been divided into three operable units under an Inter-Agency Agreement between the Army, EPA, and DEQ.

Operable Unit #1 studied possible soil contamination in the Load Line areas from explosive compounds, heavy metals, and PCB. The field investigation was completed in the spring of 1992. The data generated by this investigation has been analyzed and remediation alternatives are currently being discussed. Over one hundred alternatives have been explored, seven are currently being considered. At present the Corps is proposing that approximately 6100 cubic yards of soil will be excavated and treated. The excavations will mostly take place around vacant buildings in the Load Line areas and the old burning and proving grounds. Remediation is scheduled to begin in late 1994.

Operable Unit #2 is studying possible ground water contamination from explosive compounds and TCE. Four drilling rigs have placed over 100 observation wells on the former Nebraska Ordinance Plant, many of which are on the ARDC. Definite time tables for remediation are unclear at this time.

Operable Unit #3 will study building contamination and other possible areas of contamination not identified in Operable Units #1 and #2.

If current proposals are adopted on soil remediation, research at the ARDC will probably not be significantly affected. The contamination of the ground water will probably have the greatest impact on operations at the ARDC in the future, although this is unclear at this time.

The University has expressed concern for other DOD legacies such as asbestos and dilapidated buildings. Discussions are currently taking place on these issues.

RECOGNITION OF JUNIOR FACULTY FOR EXCELLENCE IN RESEARCH

In 1991, ARD established a new program to recognize the research contributions made by junior faculty. No more than two junior faculty are recognized each year. The award consists of a certificate, an engraved plaque, and $2,500 for use in professional development or research-related activities.

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

Seven excellent nominations were received for 1992 and the following faculty members were selected for recognition:

Dr. Leon Higley, Department of Entomology
Dr. Robert Hutkins, Department of Food Science and Technology

The recognition ceremony for these outstanding scientists will be held at 2:00 pm on October 15th in the East Campus Union. All faculty members and administrators are encouraged to attend the ceremony.

GRANT PROPOSALS - ACE & LISA

The North Central Region of the Sustainable Agriculture Research and Education Program received 15 grant preproposals from Nebraska for the 1993 funding year, accounting for about 11 percent of those received from the 12-state region. All but one of the Nebraska preproposals originated from University of Nebraska faculty. Eight preproposals were submitted under the Agriculture in Concert with the Environment (ACE) USDA/EPA program and seven were submitted to the Low-Input Sustainable Agriculture (LISA) USDA/CSRS program. The group's Administrative Council is currently reviewing the preproposals and will meet in early November to determine which projects will be asked to submit full proposals.

Under a separate program of the Sustainable Agriculture Research and Education Program, Nebraska producers submitted grant proposals for 19 projects, accounting for 17 percent of those submitted in the region. The new and innovative Implementing Sustainable Agriculture Practices Grant Program is designed to help farmers and ranchers overcome barriers they face to adopting sustainable agriculture practices. Historically, the SARE program has funded grants for research or education projects associated with land grant universities or non-profit farm groups. This is the first year mini-grants are being made directly to producers to assist with on-farm projects. About $100,000 is available for 20 producer projects. The program, which was initiated in the North Central Region, is now being duplicated in other regions. Awards for this program will be made in November.

Dr. Don Sander, UNL Agronomy Professor, this month was awarded a $51,170 grant for his two-year project "Calibration of Residual Soil Nitrate for Predicting Supplemental Nitrogen for Sorghum." Dr. Ken Frank, Associate Professor of Agronomy, is listed as the secondary investigator. The project is being funded by the Water Quality/Nitrogen Testing Special Grants Program of the USDA Cooperative State Research Service administered on a regional basis by SARE.

NEW OR REVISED PROJECTS

The following station projects were approved recently by the USDA Cooperative State Research Service:

NEB-11-092 (Biological Systems Engineering) Risk-Cost Management for Nitrate-Contaminated Groundwater Uncertainties
Investigator(s): M. F. Dahab, W. Woldt and I. Bogardi
Status: New Special Grant effective July 1, 1992

NEB-12-223 (Agronomy) A Sampling Strategy to Better Assess the Vertical Movement of Agrichemicals
Investigator(s): W. L. Powers, P. J. Shea and D. B. Marx
Status: New Special Grant effective July 1, 1992

NEB-25-003 (Environmental Programs) Participation in the National Agricultural Pesticide Impact Assessment Program
Investigator: S. T. Kamble
Status: New Special Grant effective September 1, 1992

NEB-31-002 (Center for Sustainable Agriculture) Center for Sustainable Agricultural Systems
Investigator: C. A. Francis
Status: New State project effective August 1, 1992

NEB-91-040 (Nutritional Sciences and Dietetics) Antioxidant Incorporation in Edible Films for Maintaining Meat Quality
Investigator(s): M. I. Schnepf, F. L. Hamouz, S. L. Cuppett & R. W. Mandigo
Status: New State project effective July 1, 1992

GRANTS AND CONTRACTS RECEIVED AUGUST & SEPTEMBER, 1992

Agricultural Economics	
Royer, J. - Nebr. Ethanol Authority & Development Bd.	19,696
Miscellaneous grants under $5,000 each	3,000
Agricultural Meteorology	
Blad, B. & Horst, G. (Horticulture) - Lincoln Water System	13,000
Agronomy	
Graef, G. - USDA/ARS	12,000
Powers, W., Shea, P., Marx, D. (Biometry) - USDA	125,000
Stubbendieck, J. - UN Foundation	8,064
Miscellaneous grants under $5,000 each	62,117
Animal Science	
Klopfenstein, T. - Bio Techniques	19,600
Miscellaneous grants under $5,000 each	15,890
Biochemistry	
Golbeck, J. - National Science Foundation	213,000
Nikaido, S. - National Science Foundation	64,800
Spreitzer, R. - National Science Foundation	180,000
Biological Systems Engineering	
Dahab, M. & Woldt, W. - USDA	110,000
Weller, C. - University of Massachusetts	10,680
Miscellaneous grants under $5,000 each	12,904
Director's Office	
Waller, S. - USDA/CSRS	144,584
Entomology	
Miscellaneous grants under $5,000 each	30,850
Food Processing Center	
Miscellaneous grants under $5,000 each	516
Food Science & Technology	
Miscellaneous grants under $5,000 each	1,781
Forestry, Fisheries & Wildlife	
Miscellaneous grants under $5,000 each	475
Horticulture	
Riordan, T. - U.S. Golf Association	22,500
Miscellaneous grants under $5,000 each	35,200
Northeast Research & Extension Center	
Miscellaneous grants under $5,000 each	19,000
Panhandle Research & Extension Center	
Miscellaneous grants under $5,000 each	29,758
Plant Pathology	
Mitra, A. & Langenberg, W. - USDA	55,000
Powers, T. - USDA	166,625
Miscellaneous grants under $5,000 each	6,780
South Central Research & Extension Center	
Miscellaneous grants under $5,000 each	12,700
Veterinary Science	
Osorio, F. - National Pork Producers	17,975
Miscellaneous grants under $5,000 each	17,831
West Central Research & Extension Center	
Miscellaneous grants under $5,000 each	23,451
GRAND TOTAL	**1,454,777**

PROPOSALS SUBMITTED FOR FEDERAL GRANTS

The following is a listing of proposals that were submitted after August 1, 1992 by faculty for federal grant programs. While not all grants will be funded, we applaud the faculty member's effort in submitting proposals to the various agencies.

Elizabeth Walter-Shea and Blaine Blad - NASA - Measurement of Surface Biophysical Properties and Radiation Balance - $26,675

Joseph Skopp, William Powers, Dale Swartzendruber & Dennis McCallister - Great Plains/Rocky Mountain Hazardous Substance Research Center - Determination of Unsaturated Hydraulic Conductivity in Porous Media for a Chlorinated Hydrocarbon - $180,399

Dale Swartzendruber, William Powers & Joseph Skopp - Great Plains/Rocky Mountain Hazardous Substance Research Center - Simultaneous Movement of Water/Chlorinated Hydrocarbon/Air in Porous Media as Measured by Dual-Energy Gamma-Ray Attenuation - $239,897

Steve Comfort & Patrick Shea - NCRPIAP - Predicting Atrazine Degradation and Transport Through Multiple Soil Horizons - $64,316

Steve Comfort, Patrick Shea, Dennis McCallister and William Powers - Great Plains/Rocky Mountain Hazardous Substance Research Center - The Fate and Transport of Munitions Residues in Contaminated Soils - $100,297

Curtis Weller - USDA/CSRS through Clemson University - Modification and Utilization of Grain Protein Films - $67,000

Wayne Woldt, Mohamed Dahab & Joseph Skopp - Great Plains/Rocky Mountain Hazardous Substance Research Center - Investigation of an in situ Differential Unit Impulse Active Soil-Gas Sampling Method - $78,812

Azzeddine M. Azzam - USDA/ACS - Forward Integration by Farmer Cooperatives: Comparative Impacts, Incentives, and Contractual Alternatives - $24,978

J. David Aiken - USDA/Research & Technology Division - State Laws Relating to the Ownership of U.S. Lands by Aliens and Business Entities Through December 31, 1992 - $7,500

Martin B. Dickman - BARD - Role of Phosphorylation in Fungal Spore Germination - $282,655

Blair D. Siegfried - NCRPIAP - Toxicology of Organophosphate Resistance in the Greenbug *Schizaphis graminum* (Homoptera: Aphididae) - $8,500

Terrence B. Kayes - North Central Regional Aquaculture Center (USDA) - Aquaculture Technology of Walleye - $15,222

Terrence B. Kayes - North Central Regional Aquaculture Center (USDA) - Regional Aquaculture Center - $12,480

Stephen Ernst & Paul Read- USDA Forest Service - Cotyledonary-Based Multiplication Using Seed of Selected Douglas-fir Genotypes for Conifer Defense Gene Studies - $25,000

Stephen Ernst & Paul Read - USDA Forest Service - Vegetative Micropropagation of Mature Douglas-fir - $50,000

Kyle Hoagland - North Central Regional Aquaculture Center (USDA) - Characterization of Aquaculture Effluents from Four Types of Production Systems - $15,000

Nancy M. Lewis - National Cancer Institute - NIH - Increasing Fiber Consumption of College Women - $66,005