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Agricultural Research Division News

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The Institute of Agriculture and Natural Resources University of Nebraska-Lincoln

December 1992 Volume 27, Number 3

SEASONS GREETINGS

The Agricultural Research Division extends to all IANR faculty and staff our best wishes for a joyful holiday season and a productive new year. We appreciate your assistance and cooperation in serving on project review committees, preparing research project outlines and grant proposals, and interacting with our office in a highly professional manner. The ARD staff remains dedicated to effective support of researchers and strives to become more efficient in providing services to faculty and staff.

1992 has been a good year from the standpoint of faculty research accomplishments. A number of significant breakthroughs have been achieved, grant and contract income is at the highest level in history, and a large number of faculty and administrators have received national recognition for excellence in research. We appreciate your dedicated service to Nebraska's agriculture, agribusiness, natural resources, and people. Keep up the good work in 1993.

Darrell Dale
Diane Nelvie Tom
Dora
Steve Jeff

GRADUATE STUDENT ENROLLMENT FOR 1992-1993

The table below provides data on the number of graduate students matriculating in degree programs administered by IANR units. During the past year, the number of graduate students decreased by 4 in CASNR units and 16 in the College of Human Resources and Family Sciences (CHRFS) units. Overall, the number of graduate students in IANR units decreased by 2.8% from one year ago. In CASNR units, M.S. and Ph.D. students represent 53 and 47% of the total, respectively. Conversely, Ph.D. students represent only 10% of the total graduate students in CHRFS units. Women comprise 25% of the graduate students in CASNR units, but 85% of the graduate students in CHRFS units.

International students represent 45% of the graduate students in CASNR units, but only 15% in CHRFS units. In CASNR units, graduate students are supported as follows: state GRA, 23%; grant-funded GRA, 29%; state GTA, 3%; international agency, 10%; and own funds, 35%. In CHRFS units, graduate students are supported as follows: state GRA, 8%; grant-funded GRA, 2%; state GTA, 9%; international agency, 1%; and own funds, 80%.

The ARD staff is pleased with the continuous improvement in the quality of graduate education programs and in the hands-on experience in research that is provided to graduate students. We encourage all units to maintain high standards for admission of graduate students into their programs and to provide a rigorous educational experience for all students.

	M.S. Students		Ph.D. Students		Total Graduate Students	
Department	Men	Women	Men	Women	1992-93	1991-92
	---------- Number of Students Reported ----------					
CASNR UNITS:						
Ag Economics	15	3	13	0	29	30
Ag Lead, Ed & Comm[1]	4	2	2	1	9	14
Ag Meteorology[2]	3	1	7	1	12	12
Agronomy	59	16	75	13	163	164
Animal Science	26	11	33	6	76	80
Biochemistry[3]	3	0	13	6	22	21
Biol Systems Eng[4]	26	3	13	0	42	38
Biometry	3	3	1[5]	0	7	5
Entomology	6	3	13	0	22	26
Food Sci & Tech	16	16	6	4	42	43
Forestry, Fish/Wild	14	9	2	2	27	17
Horticulture	5	7	5	4	21	24
Plant Pathology[3]	1	3	6	2	12	18
Veterinary Sci[6]	11	8	14	8	41	36
Total:	139	84	193	46	512	516
CHRFS UNITS:						
Consum & Famil Sci	16	87	0	0	103	119
Nutri Sci/Dietetics	4	38	4	9	55	55
Text, Cloth/Design	2	10	0	5	17	17
Total:	22	135	4	14	175	191
Grand Total:	214	220	205	61	687	707

[1] Ph.D. students obtain degrees in ACI or CHR programs in Teachers College.
[2] Graduate degree programs are not offered so degrees are obtained from other departments. Numbers are not included in total.
[3] Degrees obtained through Biological Sciences. Head count credit is in the School of Biological Sciences.
[4] Engineering degrees are obtained through College of Engineering & Technology.
[5] Ph.D. degrees are not awarded. Student is earning a Ph.D. in Agronomy under the director of a Biometrics Faculty member. Number is not included in the total.
[6] Ph.D. degrees are awarded by UNMC.

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

ORGANIZATIONS THAT SUPPORT AGRICULTURAL RESEARCH IN LAND GRANT UNIVERSITIES

Private Organizations

National Association of State Universities and Land Grant Colleges (NASULGC) - a higher education association whose membership comprises 150 distinguished institutions including 72 land-grant universities. (fifty-seven 1862 institutions and seventeen historically black 1890 institutions), 53 major public universities, and 25 state higher education systems. The NASULGC structure consists of ten Councils such as the Council on Business Affairs and six Commissions. The Commission on Food, Environment and Renewable Resources (CFERR) is the largest Commission. CFERR consists of five Boards; Agriculture, Natural Resources, Oceans and Atmosphere, Home Economics and Veterinary Medicine.

* **NASULGC Board on Agriculture** - a component of the newly established NASULGC Commission on Food, Environment and Renewable Resources. Its membership comprises all 1862 and 1890 land-grant colleges of agriculture plus Tuskegee University, Texas Tech University and Southern Illinois University. The Board has the following units:
  - CAHA (Council of Administrative Heads of Agriculture) - members are the chief administrators of the member colleges of agriculture.
  - ESS (Experiment Station Section) - members are the administrators of the experiment stations of all the states and territories.
    * ESCOP (Experiment Station Committee on Organization and Policy) - the representative governing body of the Experiment Station Section.
  - CES (Cooperative Extension Service) - members are the designated administrators of the cooperative extension services of all the states and territories.
    * ECOP (Extension Committee on Organization and Policy) - the representative governing body of the Cooperative Extension Section.
  - APS (Academic Programs Section) - members are the designated administrators of academic programs at the colleges of agriculture of all the states and territories.
    * ACOP (Academic Committee on Organization and Policy) - the representative governing body of the Academic Programs Section.
  - IAS (International Agriculture Section) - members are the designated administrators of international agriculture programs at the colleges of agriculture of all the states and territories.
    * ICOP (International Committee on Organization and Policy) - the representative governing body of the International Agriculture Section.
  - CARET (Council for Agriculture Research, Extension and Teaching) - an affiliated national grassroots organization of lay persons from the constituencies served by the land-grant colleges of agriculture. Each state and territory may designate up to three CARET members who work closely with their respective land-grant college. They offer guidance and support for programs in agricultural research, extension and teaching.
  - ARD (Association of Research Directors) - an affiliated organization representing the agricultural sciences research arm of the 1890 land-grant institutions and Tuskegee University. This body coordinates research program planning and budgeting with ESCOP and USDA and cooperates with national bodies in developing and monitoring legislation affecting these institutions.
* **Board on Home Economics** - a CFERR component whose membership includes the administrators of the colleges of home economics at NASULGC member institutions. The Board replaces the former Commission on Home Economics.
* **Board on Natural Resources** - a component of the CFERR whose membership includes the administrators of the colleges of forestry at NASULGC member institutions. The Board includes the former Commission on Forestry as well as several committees in the area of natural resources.
* **Board on Veterinary Medicine** - a component of the CFERR whose membership incudes the administrators of the colleges of veterinary medicine at NASULGC member institutions. The Board replaces the former Commission on Veterinary Medicine.

Agricultural Research Institute (ARI) - was formed in 1951 as an arm of the Agricultural Board of the National Academy of Sciences, National Research Council, and in 1973 became an independent, non-profit, 501(c)(3) association of groups interested in research related to food, agriculture, and natural resources. Membership consists of SAESs, ARS representatives, and private organizations conducting agriculturally-related research.

Federally Sponsored Organizations

The Joint Council on Food and Agricultural Sciences was established by Congress in 1977 to encourage and coordinate research, extension and higher education activities in the food and agricultural sciences throughout the United States. Its members, who are from both the public and private sectors, represent producers, industry, state and federal agencies and institutions. The Council's role is to plan and coordinate research, extension and higher education within both the public and private sectors and relate the federal budgeting process to the overall functioning of the system. All major units of the NASULGC Board on Agriculture are represented through voting membership on the Council; Home Economics, Forestry, Veterinary Medicine, 1890 institutions and CARET are represented as well. The Council is co-chaired by a representative of the land-grant system and the Assistant Secretary of Agriculture for Science and Education.

National Agricultural Research and Extension Users Advisory Board (UAB) is a statutory committee established by Congress in the National Agricultural Research, Extension and Teaching Policy Act (Farm Bill) of 1977, as revised by the Agriculture and Food Act of 1981, the Food Security Act of 1985 and the Food, Agriculture, Conservation, and Trade Act of 1990. The Board represents only the private sector and its members reflect the multiple interests of the users of the national agricultural science and education system. The Board has the general responsibility for preparing independent advisory opinions on the food and agricultural sciences. It reports annually to the President and Congress.

THE STATE AGRICULTURAL EXPERIMENT STATION SYSTEM

The State Agricultural Experiment Station System traces its origin to actions by the U.S. Congress, which recognized 105 years ago the need for research to benefit agriculture, rural life, and the environment. This federated system of research management which balances the needs of the states, regions and nation, is part of the land grant university system, which began with passage of the Morrill Act of 1862. This Act provided for education by establishing land grant universities in every state and territory. The provision for research was not included until 1887 when the Hatch Act was enacted and a State Agricultural Experiment Station was established in each state to provide research to undergird the educational mission of the universities.

Publicly supported agricultural research is conducted through agencies of the USDA and the State Agricultural Experiment Stations (SAES). The Hatch Act provided the basis for a state-federal partnership in funding the SAESs. The Cooperative State Research Service (CSRS) of USDA coordinates the federal research programs of the Stations and interfaces with other federal agencies. The Stations have the flexibility to respond to specific local and regional needs as they contribute to solving problems related to agriculture, natural resources, and rural communities. There are now 57 State Agricultural Experiment Stations located in states, territories, and Washington, D.C. The Agricultural Research Division is the Nebraska Agricultural Experiment Station.

Distribution of Agricultural Research Efforts by Agency

Agency	*% of Total Effort*
State Agricultural Experiment Stations	60
Agricultural Research Service	23
Forest Service	6
Economic Research Service	4
Other (1890 Colleges; Schools of Forestry; Schools of Vet Medicine)	7

ARDC INTEGRATED FARM

This past spring, the Center for Sustainable Agricultural Systems received funding for the development of an Integrated Farm at the Agricultural Research and Development Center. Dr. Terry Klopfenstein is Principal Investigator of this project and Gary Lesoing is serving as Project Coordinator. IANR faculty members interested in this project and Dan Duncan, Director of the Agricultural Research and Development Center make up the Integrated Farm Committee. This committee will plan the future direction and activities of the Integrated Farm.

The Integrated Farm is being developed into an integral part of the Agricultural Research and Development Center. This farm will integrate innovative cropping and grazing systems, and develop new systems to add value to crops and crop residues. A manure application plan that will maximize the nutritive benefit of animal wastes to crops and pastures in an environmentally sound manner will be developed. The farm will provide a demonstration and research location to education the public about sustainable cropping practices and livestock enterprises that are environmentally sound and maintain water quality.

The location of the beef feedlot, Silver Creek and the surrounding riparian area, a wetland site, and the center pivot irrigation system in the southwest corner of the ARDC, provide a unique opportunity to develop research and demonstration projects relating to water quality and soil erosion.

Initial meetings of the Integrated Farm Committee have focused on goals, the livestock-cropping balance of the Integrated Farm, and use of livestock wastes in crop rotations. The general consensus of the committee was to develop a composting strategy for the Integrated Farm. This will provide important information on the cost, feasibility, and value of compost. Compost will be used in a 6-year crop rotation of corn silage-wheat/turnips-grain sorghum-soybeans-corn grain-grain sorghum. The effect of compost on soil characteristics, crop yields, and economics will be investigated. Several current and new research projects at the ARDC will be included in the Integrated Farm. Most of these projects represent interdisciplinary research and the Integrated Farm presents an excellent opportunity to conduct interdisciplinary research involving several IANR Departments.

REPRESENTATION ON REGIONAL COMMITTEES

The Agricultural Research Division has a number of scientists who have been recently appointed to represent Nebraska on regional committees and projects. At times, the responsibilities of the representative are not always made clear before they begin participation. The following is intended to review one type of regional committee, the "NCR Committee," and the responsibilities of station representatives to NCR committees. In the North Central Region, committees are authorized to meet annually. Scientists working in a given area can exchange information and coordinate their activities so that the sum of the results of all of the individual projects will be more meaningful than if there was

less formal communication between scientists. We also have faculty who serve as representatives to similar coordinating committees in other regions. Some NCR committees have gone so far as to standardize the procedures for various laboratory measurements, or to standardize report forms so it is easier to aggregate or compare data, or to generate a regional publication. There is no direct regional research support money associated with NCR committees, other than travel support to annual meetings.

As an NCR committee representative, you represent the entire Agricultural Research Division, not just your own program or department. This means that before you go to committee meetings, you should contact other Division scientists who are conducting work in the area of interest of the committee, so you can report their activities as well as your own. In preparing for the meeting, you may ask the scientists to prepare short statements for you. Then upon return from a meeting, you should report to other scientists and the director. Your report may include the minutes and a brief report that you prepare. Your responsibility may also be met by circulating the handouts received at the meeting, or by informal visits with the scientists. In general, experience shows that the best representatives have combined all of these techniques to meet their responsibilities.

All representatives to NCR committees or to similar committees in other regions are asked to consider their responsibilities as a committee member and make an effort to represent the overall research activity as effectively as possible.

ARD ADVISORY COUNCIL UPDATE

The ARD Advisory Council (The Council) is alive and well. The nine faculty representatives meet with the ARD Deans approximately six times annually. The Council provides feedback to the Deans on current topics and discusses faculty's concerns with them. We want to hear from you; what are your concerns or ideas?

A current project of The Council is to develop a workshop on Program Management for Scientists. The intent of this program is to help researchers manage grant budgets, people, and time. This program is planned for early summer 1993.

The Council has subcommittees that review proposals and applications for the following recurring programs:

- ✓ Junior Faculty for Excellence in Research Awards
- ✓ Widaman Trust Distinguished Graduate Assistant Awards
- ✓ UNL Foundation Grants
- ✓ Interdisciplinary Research Grant
- ✓ International Travel Grant
- ✓ Innovative and High Risk Research Grant

Faculty can keep up with The Council's activities by reviewing the minutes of our meetings. They are sent to the Unit Administrators for distribution.

1992-93 Council members are: Dean Eisenhauer (chairman), Julie Albrecht (secretary), David Mortensen, Ken Hubbard, David Baltensperger, John Rupnow, Edward Peters, Chris Calkins, and James Partridge. Please contact us if you have something that you want us to discuss with the Deans.

ARD ADMINISTERED GRANT AND AWARDS PROGRAMS

The Agricultural Research Division administers several grant and recognition programs using ARD funds, NU Foundation funds and funds from other sources. Some of these are awarded annually on a regular schedule and some on an ad hoc basis as funds permit. The following summary explains some of these programs and how they are currently being administered.

NU Foundation Endowments

Anna H. Elliott Fund Grants
Awarded every two years as endowment income permits. Income is about $70,000 annually and program is oriented to plant science research directed to western Nebraska. RFP issued about **January 15th.**

Sampson Range and Pasture Management Endowment
Awarded every two years as endowment income permits. Three research, extension or teaching projects are funded every two years. The program is directed at pasture and rangeland management and the study of native grasses. RFP issued about **January 15th.**

Mussehl Poultry Research Endowment
Awarded every two years as endowment income permits. Income is about $25,000 per year. Research in poultry management, health, nutrition, physiology, waste management and utilization, and poultry product research is supported by program. RFP is issued about **June 1st.**

Widaman Trust Graduate Fellowship
Awarded annually. $1,200 added to stipend of outstanding graduate students. Nominations are made about **May 10th.**

Hardin Distinguished Graduate Fellowship in Plant Stress Physiology
Awarded annually. $2,000 added to stipend of a selected student plus $1,000 to the department to assist student's research. One grant awarded annually. Nominations are made about **May 1st.**

Mary and Charles C. Cooper/Emma I. Sharpless Fellowships
Jointly awarded on an annual basis by ARD and CASNR. $1,000 or $2,000 added to stipend of selected graduate students for assistance in recruitment. Applications are accepted throughout the year.

ARD/International Programs Indirect Cost Funds

ARD Foreign Travel Awards
One or more grants of up to $1,000 each awarded. $3,000 + total available annually for research-related foreign travel for professional development opportunities (not for professional society meetings). RFP issued when funds are made available.

ARD Discretionary Funds

Interdisciplinary Research Team Grants
Awarded annually depending on flexibility of funds. Two or three grants awarded for up to two years duration and for up to $20,000 annually. RFP issued about **February 1st.**

Innovative and High Risk Research Program
Awarded annually depending on availability of funds. The purpose is to provide initial funding for innovative research that will lead to extramural grant proposals. $15,000 per year for up to two years will be provided. Applications accepted anytime during the year although call for proposals will be issued in **June.**

Graduate Student Recruitment Funds
Awarded as requested by departments. Up to 2 per department per calendar year. Award pays up to 50 percent of expenses or $200 per student. Purpose is to reimburse recruitment visits to UNL for students offered assistantships.

Junior Faculty Excellence in Research Recognition
Up to 2 junior faculty recognized per year. Recognition consists of certificate, plaque, and $2,500 for use in research or professional development. Call for nominations is issued on **June 1st.**

SAES Leadership Development Course
One or two faculty members are selected for participation each year. Award consists of tuition and travel expenses associated with SAES Leadership Development Course. Participants spend about 10% of their time serving as administrative interns in ARD.

ARD/State Budget Funds

ARD Research Equipment Awards
Awarded annually, as provided in state appropriations. Approximately $225,000 awarded annually to all ARD units, according to prioritized requests. RFP issued about **September 1st.**

ARD Royalty Income

Calf Scours Royalty Funds Grants
Awarded annually or biannually, depending on income. Approximately $60,000 awarded annually for animal health related research by competitive RFP or to discretionary research laboratory improvement needs.

Other Programs Coordinated by ARD

Layman Awards (NU Foundation Funds)
Awarded annually for research support. Size of awards vary from $1,000 to $15,000. RFP issued about **October 1st.**

NU Foundation Grants (NU Foundation Funds)
Awarded annually for equipment purchase and support of special programs. Size of awards vary from $10,000 to $50,000. RFP issued about **March 1st.**

Nebraska Bankers Association Grants
Awarded annually for research/education programs relating to economic development. Size of awards vary from $5,000 to $20,000. RFP issued about **September 1st**

Nebraska Commodity Check-off Board Grants
Annually research grants usually in the $5,000 to $20,000 range. RFP issued about **October 1st.**

The Agricultural Research Division also helps process research grant proposals directed at federal and state agencies, foundations, corporations, and private organizations. The Dean for Agricultural Research has final sign-off authority for all proposals directed to USDA agencies. Proposals to other agencies and organizations are sent by ARD to the Office of Sponsored Programs for final processing.

Anyone with questions about these programs is encouraged to contact the Agricultural Research Division office.

PROPOSALS SUBMITTED FOR FEDERAL GRANTS

The following is a listing of proposals that were submitted after October 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.

James Stubbendieck - National Park Service - An Assessment of Exotic Plants at Scotts Bluff National Monument and Effigy Mounds National Monument - $47,680

Stephen W. Ragsdale - U.S. Department of Energy - Mechanistic Enzymology of CO Dehydrogenase from *Clostridium thermoaceticum* - $94,000

Robert J. Spreitzer - National Science Foundation - Genetic Modification of Chloroplast Rubisco - $648,090

John Markwell - National Science Foundation - Chloroplast Thylakoid Protein Phosphatase - $207,227

Marion O'Leary - National Institute of Health - Nebraska Summer Faculty Fellowship - $144,849

The September 1992 newsletter listed Azzeddine M. Azzam as the principal investigator for a grant from the USDA/ACS entitled "Forward Integration by Farmer Cooperatives: Comparative Impacts, Incentives, and Contractual Alternatives". Jeffrey S. Royer is the principal investigator.

NEW OR REVISED PROJECTS

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

NEB-11-093 (Biological Systems Engineering) Development & Evaluation of Sensors & Control Systems for Seed Handling & Delivery
Investigator: M. F. Kocher
Status: New Hatch project effective September 1, 1992

NEB-11-095 (Biological Systems Engineering & Agronomy) Improvement of Water Quality by Use of a Sensor Controlled Intermittent Sprayer
Investigator(s): K. VonBargen, G. E. Meyer & D. A. Mortensen
Status: New Special Grant effective September 1, 1992

NEB-12-224 (Agronomy) Soil and Crop Management Effects on the Nitrogen Cycle
Investigator: D. T. Walters
Status: New Hatch project effective September 1, 1992

NEB-14-068 (Veterinary Science) Molecular Analysis of the Bovine Immune Systems: Dissection of Mammary Gland T Cell Repertoire
Investigator: S. S. A. Chen
Status: New Hatch project effective August 7, 1992

NEB-16-062 (Food Science & Technology & Agronomy) Characterization of Wheat Proteins & Their Relationship to Breadmaking Quality
Investigator(s): R. L. Wehling, M. G. Zeece & D. R. Shelton
Status: New Competitive Grant effective September 15, 1992

NEB-21-051 (Plant Pathology) Enhanced Nematode Diagnostics by Polymerase Chain Reaction
Investigator: T. O. Powers
Status: New Competitive Grant effective September 1, 1992

NEB-21-052 (Plant Pathology) Fungal Zoospore Mediated Transfer of Foreign DNA into Plants
Investigator(s): A. Mitra & W. G. Langenberg
Status: New Competitive Grant effective September 1, 1992

GRANTS & CONTRACTS RECEIVED OCTOBER & NOVEMBER, 1992

Agricultural Economics	
Aiken, J. - USDA	7,500
Anderson, D. & Azzam, A. - USDA/APHIS	83,719
Cordes, S., Royer, J. & Allen, J. - USDA	100,000
Miscellaneous Grants Under $5,000 each	2,500
Agricultural Meteorology	
Walter-Shea, E. & Blad, B. - NASA	26,675
Agronomy	
Diestler, D. & Shearman, R. - Purdue University	14,538
Mortensen, D. - USDA	46,867
Sander, D., Frank, K., & Penas, E. - USDA	30,300
Shea, P. - USDA/ARS	22,440
Stubbendieck, J. - National Park Service	47,680
Stubbendieck, J. - Nebr. Game & Parks Commission	7,188
Miscellaneous Grants Under $5,000 each	32,715
Animal Science	
Keown, J. - Holstein-Friesian Ass'n of America	17,500
Klopfenstein, T. & Stock, R. - Lignotech	15,000
Stock, R. & Klopfenstein, T. - MN Corn Research & Promotion Council	31,060
Miscellaneous Grants Under $5,000 each	32,254
Biochemistry	
Chollet, R. - USDA	120,000
Dam, R. - San Diego State University	9,000
Darr, S. - USDA	120,000
Golbeck, J. - Rockefeller Foundation	40,900
O'Leary, M. - NIH	144,849
Ragsdale, S. - U.S. Dept. of Energy	326,550
Spreitzer, R. - NSF	85,000
Wagner, F. - Nebr. Dept. of Economic Dev.	60,000
Biological Systems Engineering	
VonBargen, D. & Meyer, G. - USDA	63,133
Weller, C. - American Soybean Association	33,194
Miscellaneous Grants Under $5,000 each	12,136
Director's Office	
Waller, S. - USDA	1,490,416
Entomology	
Foster, J. - USDA/ARS	20,000
Stanley-Samuelson, D. - NIH via Oklahoma State Uni.	16,449
Miscellaneous Grants Under $5,000 each	14,650
Food Processing Center	
Miscellaneous Grants Under $5,000 each	3,220
Food Science & Technology	
Bullerman, L. - Ohio State University	15,000
Wehling, R., Zeece, M., & Shelton, D. - USDA	91,789
Miscellaneous Grants Under $5,000 each	3,591
Forestry, Fisheries & Wildlife	
Ernst, S. - USDA/FS	75,000
Hoagland, K. & Kayes, T. - No. Central Regional Aquaculture Ctr.	15,000
Hoagland, K. - Office of Naval Research	56,117
Kayes, T. - No. Central Regional Aquaculture Ctr.	12,480
Kayes, T. - Michigan State University	15,222
Miscellaneous Grants Under $5,000 each	28,718
Horticulture	
Coyne, D. - Michigan State University	220,685
Riordan, T. - National Turfgrass Evaluation Program	6,000
Miscellaneous Grants Under $5,000 each	25,026
Industrial Agricultural Products Center	
Chinnaswamy, R. & Hanna, M. - USDA	152,000
Hanna, M. - Iowa State University	39,000
Northeast Research & Extension Center	
Shapiro, C. - TVA	12,000
Shapiro, C. & Brumm, M. - National Pork Producers Council	15,500
Miscellaneous Grants Under $5,000 each	28,610
Panhandle Research & Extension Center	
Pavlista, A. - Nebraska Potato Development Board	15,000
Rush, I. - Moorman Mfg. Co.	7,200
Weichenthal, B. - Nebraska Potato Development Board	8,000
Miscellaneous Grants Under $5,000 each	36,316
Plant Pathology	
Dickman, M. - USDA	50,000
Mitra, A. & Dickman, M. - Midwest Plant Biotechnology Consortium - Purdue University	83,750
Steadman, J. - Uni. of Puerto Rico	37,600
Miscellaneous Grants Under $5,000 each	37,000
South Central Research & Extension Center	
Miscellaneous Grants Under $5,000 each	8,750
Veterinary Science	
Chen, A. - Tanox Biosystems Inc.	24,700
Donis, R. - USDA	200,000
Donis, R. - UN Foundation	10,000
Jones, C. - USDA	100,000
Miscellaneous Grants Under $5,000 each	8,108
West Central Research & Extension Center	
Miscellaneous Grants Under $5,000 each	9,749
GRAND TOTAL	**4,525,344**