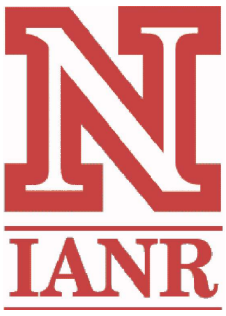
PLAN OF WORK



Agricultural Research Division
Institute of Agriculture and Natural Resources
University of Nebraska

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2000 to 2006

Plan of Work Outline
Update
University of Nebraska Agricultural Research Division
FY 2000 to 2006

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Plan of Work Update

I. INTRODUCTION

The University of Nebraska Agricultural Research Division (ARD) is also the Nebraska Agricultural Experiment Station. It is a division of the University of Nebraska Institute of Agriculture and Natural Resources.

The original Plan of Work described the planned research programs for the Agricultural Research Division for the fiscal years 2000 to 2004, as required by the Agricultural Research, Extension, and Education Reform Act of 1998. It included the elements identified in the USDA document, "Guidelines for Land Grant Institution - Plan of Work". The plan was based on the current strategic plan of IANR and on emerging issues identified through stakeholder input in anticipation of beginning the next revision of the IANR Strategic Plan. The Plan of Work was for the research programs only, but was developed in conjunction with University of Nebraska Cooperative Extension Division's Plan of Work.

This Plan of Work revises and updates the original Plan of Work to fiscal years 2004 to 2006. It will continue to address the five National Goals as described in the FY 2000-2004 Plan of Work. However, changes in research program emphasis are projected due to changes in state, regional and national priorities and due to budget shortfalls. While the following is based on level funding allocations, the allocations are likely to be lower. This plan of work update is also based on implementation of a revised Strategic Plan in the Institute of Agriculture and Natural Resources and on emerging issues identified through stakeholder input.

In FY 98, Agricultural Research Expenditures in support of the programs described in this plan totaled $52,533,403. Of this amount, Hatch Act Federal Formula Funds provided $3,307,474 or 6.3% of the total funds expended. In FY 2003, Agricultural Research Division expenditures in support of the programs described in this plan totaled $72,995,556. Of this amount, Federal Formula Funds provided $3,514,633 or 4.8% of the total funds expended.

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II MATRIX (5 Federal Goal Areas)

Goal I: To achieve an agricultural production system that is highly competitive in the global economy.

Issue(s):

Producing and processing crops and livestock are the mainstays of Nebraska's economy. IANR's research, education, extension and service programs have played an integral role in enhancing the competitiveness, increasing the profitability, and improving the sustainability of agriculture and agribusiness in the state. As the dynamics of the state's agricultural industry change in the next century, it will be even more important that IANR be prepared with research and education programs that bolster traditional agriculture while providing resources for alternative enterprises. It will continue to be important to address the entire cycle of food production, processing, marketing and consumption, integrating the concerns of the producer and the consumer to provide a safer and more sustainable food product.

Strong programs will be maintained in production, marketing and processing of the major livestock species, traditional field crops, and specialty crops such as dry edible beans and turf. Additional emphasis will be placed on developing production systems that are sustainable, environmentally benign, and conserve natural resources, yet profitable. New crops, increased instate production and processing, and development of new products and services also will be emphasized. Special attention will be given to integrated approaches for production, protection, and processing of Nebraska's commodities.

Nebraska Goals:

1. Enhance animal and plant production systems to be more profitable and sustainable.
2. Support agribusiness and economic development, including product marketing and value-added processing of agricultural commodities.
3. Increase public/consumer understanding of food systems.

Output Indicators:

1. Improved integrated systems for plant and animal production and protection.
2. New basic knowledge of importance to the improvement of plant and animal production systems.
3. Improved practices for conservation of resources and water and air quality protection.
4. New products and improved value-added processing of agricultural commodities and by-products.
5. Enhanced access for clients and consumers to research-based information about agriculture and natural resources.

Outcome Indicators:

1. Adoption of improved plant and animal genetic material by producers.
2. Improved marketing opportunities for Nebraska commodities and products.
3. Improved income level and stability for producers.
4. Growth in Nebraska-based value-added processing.

5. Improved levels of health and growth efficiency for agricultural plants and animals.
6. Greater public awareness and advocacy for research programs.

Key Program Components:

Research:

Efforts focused on:

1. plant and animal health.
2. new and improved industrial products from agricultural commodities.
3. basic understanding of plant and animal genetics and physiology.
4. more efficient use of production inputs.
5. prevention and/or minimizing of undesirable environmental impact.

Joint Research/Extension:

We have a combined Extension and Research team dealing with precision farming. Extension has an Integrated Pest management (IPM) team and Research has several IPM projects. Team goals and project objectives are complimentary and some of the Extension team members are principal investigators on the Research projects. Several team members also carry joint Extension and Research appointments. There is also Extension and Research representation on a multi-state IPM committee.

Internal and External Linkages:

Research and Extension specialists, Extension Educators at the University of Nebraska-Lincoln, neighboring state institutions, commodity groups, Nebraska Independent Crop Consultants Association, seed fertilizer and pesticide suppliers, commercial pesticide applicators, Certified Crop Advisors.

Target Audiences:

Results will be usable by a broad range of agricultural producers and processors, from small to large in size. Nebraska-based processors, especially start-up companies will receive high priority.

Program Duration:

Our strategic planning and our ARD faculty project portfolio operate on 5-year cycles.

Allocated Resources ($ x 1,000) and SYs:

	FY1999	*F 2000*	*F 2001*	*FY2002*	*FY2003*	*FY 2004*	*FY2005*	*FY2006*
Funding:	40,966	42,604	44,308	46,081	47,924	49,841	49,841	49,841
SYs:	100	98	97	96	95	94	94	94

Goal II: A Safe, Secure Food and Fiber System

Issue(s):

Providing a safe food supply is a common goal throughout the food chain from consumers, to food handlers, to food processors and food producers. This goal is upheld by the number of foodborne illnesses that occur in the United States. The USDA has estimated that in 1993, 3.6 to 7.1 million cases of foodborne illness occurred that resulted in 2,695 to 6,587 deaths. Several recent foodborne illness outbreaks (*E. coli 0157:H7*, Salmonella, Hepatitis A) in Nebraska emphasizes the need for education of food handlers on safe food handling techniques and the need for research to better identify and implement preventative controls to improve food safety.

The processing of Nebraska commodities of beef, pork, poultry, dairy, corn, soybeans, and other crops is represented by numerous large-medium-and small-size food processors. New technologies and management systems that enhance food safety and quality need to be developed. Listening sessions throughout Nebraska in recent months identified food safety as an increasing concern. Recent foodborne illness outbreaks in Nebraska have brought this to the forefront for consumers, food processors, and farmers/ranchers. Nebraska has experienced illness and hospitalization of individuals, the closing of meat packing plants, and restaurants sued as a result of breakdowns in the food safety chain.

Food safety has emerged as a very high priority research area nationally in recent years. Food animal production is a major component of the Nebraska economy and the Nebraska AES has a significant food safety research effort. Research faculty working in this area are working closely with the food industry and regulatory agencies to focus research efforts on the most critical problems as well as anticipated future issues. Efforts will be made to enhance the grant support in this area and to use interdisciplinary approaches to address all safety aspects of food production and handling.

Nebraska Goals:

1. Animal and plant production systems and food processing and distribution systems will be enhanced to improve food safety and quality.
2. Research-based information will increase awareness of consumers, producers, food processors, food handlers and extension personnel on food safety issues and technologies.

Output Indicators:

1. Enhanced research efforts on food safety and quality, especially from Nebraska commodities and including both pre-harvest and post-harvest technologies, with corresponding outputs of useful information.
2. Better broad-based collaboration to identify and assess technologies to enhance the production and processing components of food systems.
3. Increased understanding and utilization by food producers and processors of new technologies that enhance the safety and quality of foods.

Outcome Indicators:

1. Adoption of new and improved research-based food safety technologies by producers, food processors, food handlers, and consumers.
2. Reduction in the number of reported cases of foodborne illnesses.
3. Reduction in the number of food safety infractions in inspected food processing and handling establishments.

Key Program Component(s):

Research:

Research efforts focused on pre- and post-harvest aspects of plant and animal food safety. Emphasis will be on developing effective preventative measures to control foodborne pathogens prior to food reaching the consumer. .

***Joint Research/Extension*:**

The University of Nebraska Research and Cooperative Extension Divisions of the IANR both have faculty teams addressing food safety. The teams have complimentary goals and overlapping membership with several team members carrying joint Research and Extension appointments.

Internal and External Linkages:

Partnerships will be maintained with Extension Educators, Researchers and Extension Specialists at the University of Nebraska and neighboring state institutions, commodity groups, food processing companies, Nebraska restaurant associations as well as restaurants in communities across the state, nursing homes, schools, state and local health departments, state department of agriculture, farmers, ranchers, and meat processors.

Target Audiences:

Research results will be used by agricultural producers, food processors, food handlers and consumers. Of particular importance are smaller meat and food processors and farmers/ranchers who produce milk, eggs, and meat animals for slaughter.

Program Duration:

Our strategic planning and our ARD faculty project portfolio operate on 5-year cycles.

Allocated Resources ($ x 1,000) and SYs:

	FY1999	*FY 2000*	*FY 2001*	*FY 2002*	*FY 2003*	*FY 2004*	*FY2005*	*FY2006*
Funding:	2,210	2,298	2,390	2,486	2,585	2,688	2,688	2,688
SYs:	8.3	8.8	9.3	9.8	9.8	10.3	10.3	10.3

Goal III: A Healthy, Well-nourished Population

Issues:

The Nebraska 1993 Vital Statistics Report indicates the ten leading causes of death for adults in descending order are heart disease, cancer, cerebrovascular disease, pneumonia, accidents, chronic lung disease, diabetes mellitus, atherosclerosis, suicide and nephritis-nephrosis. Nebraska Health Profile 1994 data indicate the workplace death rate in Nebraska is significantly higher than the United States as a whole. Nebraska agricultural death rate is 35 per 100,000 agricultural workers compared to the national rate of 25 per 100,000. In addition there are an estimated 2400 Nebraska farm and ranch injuries annually which fall into categories of injuries caused by: 1) livestock, 2) machinery (excluding tractors and all terrain vehicles), 3) hand held and power tools, and 4) tractors. Injuries resulting in disability or functional limitations not only affect the income-producing potential of individuals but will increase hospitalization and rehabilitation costs for those same individuals and families.

More than half of Nebraskans have sedentary lifestyles, one-fourth are categorized as being overweight, and nearly one in five are hypertensive (Nebraska Behavioral Risk Factor Survey, 1991-1992). Alcohol misuse and tobacco use, including smokeless tobacco, are also prevalent in a significant portion of the Nebraska population. At the beginning of the life span, the Center for Disease Control has established that pregnancy outcome and health of infants are affected by ethnicity, maternal age, marital status, and socioeconomic status. Pregnancy Nutrition Surveillance System (PNSS) data gathered from 15 Nebraska WIC sites indicate that PNSS women are younger, less educated, more likely to be unmarried, and more likely to represent a minority group than the general Nebraska population of women giving birth.

Many of the above health concerns have nutritional implications, resulting in several researchable issues that can be addressed through ARD research programs.

Nebraska Goal:

To enhance the quality of life of individuals and families through healthy lifestyles including better nutrition and reduction of high-risk activity.

Output Indicators:

1. Improved knowledge of human nutrition and dietary habits of youth and adults
2. Improved knowledge of relationships between human nutrition and certain health problems.
3. New researched-based recommendations on nutritional practices to improve human health.
4. Enhanced collaborative education and demonstration programs on nutrition and safety, working with local state and federal agencies, schools, health care organizations, businesses, and others.

Outcome Indicators:

1. Incorporation of improved nutritional recommendations made by nutrition professionals.
2. Increase in consumer purchases and consumption of recommended food groups, including speciality items related to specific health issues.
3. Documented reduction in nutrition-related health problems in Nebraska.

Key Program Components:

Particular areas of emphasis include lipid metabolism, bioavailability of nutrients, eating behaviors and disorders, biochemistry of cardiac illnesses, and function of health care and family support systems.

Human health and nutrition research is a small component of the Nebraska AES portfolio, comprising under 1% of the expenditure and under 2% of the research faculty FTE. It remains an important area, however, and it is anticipated that this program area will have stable or modestly increasing resources. The nutrition research is also linked with animal nutrition research and the combined research faculty FTE in this area provides more than adequate critical mass for a strong research and education program in this area.

Target Audiences:

Research results can be used by a broad range of health care professionals, educators, food processors and marketers, and consumers of all ages.

Internal and External Linkages:

Partnerships will be maintained with Extension Educator, Researchers and Extension specialists at the University of Nebraska and collaborating land grant institutions, Department of Health and Human Services, Department of Education, appropriate legislators, appropriate health related entities such as the Nebraska Hospital Association. Additionally the other units of the University of Nebraska system such as the University of Nebraska Medical Center will be involved in this program.

Program Duration:

Our strategic planning and ARD faculty project portfolio operate on 5-year cycles.

Allocated Resources ($ x 1,000) and SYs:

	FY1999	***FY 2000***	***FY 2001***	***FY 2002***	***FY 2003***	***FY 2004***	***FY 2005***	***FY2006***
Funding:	4,630	4,815	5,008	5,208	5,406	5,633	5,633	5,633
SYs:	1.9	1.9	2.4	2.9	2.9	3.4	3.4	3.4

Goal IV: To Achieve Greater Harmony (Balance) Between Agriculture and the Environment

Issue(s):

Agricultural producers were some of the original stewards of the nation's natural resources. New knowledge of complex ecosystems, increased environmental regulations and policies, demands from consumers and a competitive world marketplace have changed the face of stewardship. There is a need for programs that equip producers with information and strategies enabling them to produce food, fiber and forest products in an environmentally benign and sustainable, yet economically viable, manner.

The quality of air, soil and water resources is critical not only to continued food production but to the overall well-being of all living things. Water quality and quantity are critical issues in Nebraska. Both surface and groundwater may be contaminated by agricultural, manufacturing and other human activities. Nebraska depends heavily on an adequate water supply. Uses such as irrigation, municipal supply, industry, and wildlife needs often conflict when water supplies are limited.

Despite many years of effort to improve management, soil erosion is continuing at unacceptable rates in some parts of Nebraska. Soil quality required for sustained productivity is threatened by outdated cultural practices, inappropriate land use, and improper waste disposal practices. Waste disposal continues to be an important issue of Nebraska, especially environmentally acceptable animal waste management.

Our knowledge of how ecosystems respond to environmental changes and management activities is extensive but narrowly focused. It must be broadened to better maintain the biological diversity of managed and natural ecosystems. To ensure a high quality environment for the future, Nebraskans must manage natural resources on a sustainable basis. Achieving a high quality environment requires well conceived and executed programs of research, education and service focused on youth and adult clientele, as well as extensive cooperation with federal and state agencies.

Research activities in support of Goal Area IV have increased in recent years as a result of redirected research resources and of improved external grant support. Improved natural resources management and environmental quality while maintaining a productive and profitable agricultural industry is identified clearly as one of the three major themes in the IANR strategic plan.

Nebraska Goals:

1. Improved environmental quality by conserving and enhancing air, soil and water resources
2. Improved ecosystem management for sustained productivity and enhanced biodiversity.
3. Increased information and expertise on natural resources and environmental issues for facilitating policy development and successful implementation programs.

Output Indicators:

1. Fully implemented Blue River Basin Project as an IANR Special Interdisciplinary Team effort in partnership with Kansas State University scientists.
2. A better understanding of processes leading to contamination of air, water and soil with development technologies to minimize resource degradation and remediate contamination where feasible.
3. Improved methods for use of animal waste.
4. Increased efficiency in the use of irrigation water by Nebraska producers through strengthened research and demonstration projects.
5. Development of integrated production systems that are profitable, yet sustainable and environmentally benign.
6. Development of management concepts for diverse ecosystems that focus on preservation or enhancement of landscape-level characteristics.
7. Improved natural resources management programs.

Outcome Indicators:

1. Use of ARD-generated research results by decision-makers as science-based information on which to base policy decisions.
2. Emergence of new School of Natural Resource Sciences as a leading academic unit dealing with natural resource systems in the Great Plains.
3. Adoption by producers of improve natural resource and waste management practices.
4. Improved surface and ground water quality related to changes in agricultural practices.
5. Documented improvement in irrigation water use efficiency.
6. Documented reduction in soil erosion from agricultural lands.

Key Program Component(s):

Research

Major areas of research emphasis include agricultural meteorology and climatology, water science and irrigation management, riparian zone ecology and management and remote sensing for natural resource management. Research is conducted in multiple departments and interdisciplinary research is strongly encouraged.

In 1997, IANR formed a new School of Natural Resources Sciences (SNRS) culminating several years of planning and organizing. The combined units forming the new school make this one of the strongest units of this type regionally and nationally. Significant resources have been redirected into the SNRS, through the UNL reallocation process and through internal IANR allocations. External grants have been steadily increasing and the formation of the school should enhance that in the future. Multi-state efforts will increase. Overall. activities in support of Goal Area IV are expected to maintain a steady rate of increase in future years.

Joint Research/Extension

We have a combined Extension and Research team dealing with livestock and environmental issues. Extension has a water quality team and the Nebraska Agricultural

Experiment Station has several water quality projects. Team goals and project objectives are complimentary and some of the Extension members are principal investigators on the research projects. Several team members also carry joint Extension and ARD appointments. There is also Extension and ARD representation on multi-state water quality committee and on the national manure management initiative.

Internal and External Linkages:

School of Natural Resource Sciences, School of Biological Sciences, Agronomy, Biological Systems Engineering, Agricultural Economics, Research and Extension Centers, Civil Engineering, Natural Resources Conservation Service, Nebraska Department of Agriculture, Nebraska Department of Environmental Quality, US EPA Region VII, Nebraska Commodity Boards, Nebraska Groundwater Foundation, and Natural Resources Districts.

Target Audiences:

Results will be used by agricultural producers, ranchers, irrigators, natural resource managers, technology transfer agencies, lawmakers, and others.

Program Duration:

Our strategic planning and our ARD faculty project portfolio operate on 5-year cycles.

Allocated Resources ($ x 1,000) and SYs:

	Current	*FY 2000*	*FY 2001*	*FY 2002*	*FY 2003*	*FY 2004*	*FY2005*	*FY2006*
Funding:	10,260	10,670	11,097	11,541	12,003	12,483	12,483	12,483
SYs:	34	34	35	35	36	36	36	36

Goal V: To Enhance Economic Opportunities and the Quality of Life Among Families and Communities

Issue(s):

The demographics of Nebraska are changing at such a rapid pace that policy-makers have difficulty keeping adequately informed. With a higher proportion of elderly, families with income below poverty level, and immigrants with limited English skills, many areas of the state need enhanced entrepreneurial opportunities, business management and computer skills for small home-based and family owned businesses. ARD research programs deal with policy issues as well as research to assist educational programs in this area. The research programs are closely linked to Cooperative Extension educational program activities. The specific Nebraska goals related to this area are:

1. Enhanced basic life skills for Nebraska's children, youth and adults.
2. To enhance business and livable employment opportunities.

State and federal public policy decisions are often made with little understanding of their impact on rural people. To provide objective information on rural Nebraskans views and concerns, the University of Nebraska rural sociologist launched the Nebraska Rural Poll in 1996. This scientific poll annually surveys 7,000 randomly selected residents in the state's 87 rural counties on issues related to public policy, community, work and quality of life. Results are analyzed and shared with state and federal lawmakers, decision-makers, the public and communities. In addition to a set of standing questions, researchers ask a few different questions each year that address emerging issues, such as taxation, farm policy or school consolidation. Results over time also track trends and changes for rural Nebraskans and provide a rural perspective for policy discussions.

Nebraska Goals:

1. Enhance basic life skills among Nebraska's children, youth and adults.
2. Enhance business and liveable employment opportunities.

Output Indicators:

1. Strengthened individual and family capacity to overcome violence, youth violence, abuse, accidents and acts of nature crises.
2. Improved coping skills among children and youth in "at risk" situations.
3. Improved youth skills in examining ethical issues and applying ethical principles.
4. Identification of the factors characteristic of resilient families.
5. Enhanced entrepreneurial opportunities, business management and computer skills for small, home based and family-owned businesses.
6. Better socioeconomic data bases for communities, businesses, families and youth.
7. Strategies for economic resiliency among single- and duel-earner families.

Outcome Indicators:

1. Incorporation of new research based information in educational programs addressing family and individual living skills.
2. Expansion in the number of new businesses started and in the number of start-up businesses that are successful.
3. Enhanced opportunities for access to and training with modern technologies in rural and small communities.

Key Program Components:

Research

This area is also one of the major themes of the IANR Strategic Plan. There are significant changes occurring in the rural area economics that create issues and problems for residents. Research is needed in many instances to help as input to program and policies in order to make the best decisions for the short and long term. Research programs can be expected to grow modestly, largely with help from external grants.

Areas of research emphasis include rural policy issues related to health care, affordable housing, and telecommunications. Family resiliency and coping skills of children and youth are additional areas of focus. Research is being conducted to develop socio-economic data-bases relative to communities, businesses, families, and youth to enhance development opportunities and improve leadership skills.

Research and Extension

Research programs are heavily linked to Cooperative Extension educational program activities. One current joint program is to assess and teach managerial and work force professional development interventions that increase employee retention, performance, and productivity.

Internal and External Linkages

Department of Health and Human Services, Departments of Education and Economic Development, school personnel such as teachers and principals, businesses, local public policy makers (i.e. city councils), youth-serving organizations such as FCLA and FFA, service organizations, Nebraska Enterprise Opportunity Network, National SARE Project, Nebraska Division of Technology, Center for Rural Affairs, Partners for Rural Nebraska, health care providers, child care providers, mental health agencies, and Family Preservation Teams.

Target Audiences:

Children and older youth, parents, teachers of elementary and secondary students, Extension Educators, people with ideas for businesses not yet in business, home-based business owners, main street businesses, agricultural producers, and social service agencies.

Program Duration:

Our strategic planning and our ARD faculty project portfolio operate on 5-year cycles.

Allocated Resources ($ x 1,000) and SYs:

	FY1999	***FY 2000***	***FY 2001***	***FY 2002***	***FY 2003***	***FY 2004***	***FY 2005***	***FY2006***
Funding:	1,371	1,426	1,483	1,542	1,603	1,668	1,688	1,688
SYs:	7	7	8	8	8	8	8	8

III. PROCESSES USED FOR STAKEHOLDER INPUT

B. Stakeholder Input Process

The processes used for stakeholder input for the Agricultural Research Division were described in detail in the initial ARD Plan of Work. Nebraska has had an extensive system of stakeholder input in place for many years. The Agricultural Research Division and the Cooperative Extension Division collaborate routinely in the planning and development of programs. These

divisions, as part of the Institute of Agricultural and Natural Resources (IANR), have been partners in development of Strategic Plans for over 10 years. Several of the stakeholder input processes described in the 2003 Annual Progress Report for the Cooperative Extension Division will impact Agriculture Research Division planning.

a) Actions Taken to Seek Stakeholder Input

IANR conducted over 30 listening sessions with approximately 700 Nebraskans in 2003. The sessions were held all across the state. While the sessions were open to the general public, special invitations were made to ensure representation by underserved groups. The participants included limited resource audiences, state and local agency representatives, volunteer organization representatives, school officials, in-state clientele and out-of state stakeholders. The findings from the listening sessions have been reviewed with administrators and faculty. Both IANR and ARD's next five-year strategic plan is based on the results from the sessions.

Most IANR departments, research and extension centers, interdisciplinary centers and program areas have external advisory groups representing stakeholders and users. These groups meet at least annually and provide input on current and future programs of the units. The Agronomy Department Advisory Board has 25 members who meet twice annually. They provided information on strategic issues related to Agronomy and Horticulture teaching, research and extension. An Animal Science Department Advisory Committee was established in 2001 and has met several times. It has 27 members from various segments of the livestock, meat, and feed industry.

The Northeast Nebraska Experimental Farm Association serves as the stakeholder input group for the Northeast Research and Extension Center and Haskell Agricultural Laboratory. This group consists of representatives from each of the counties in the northeast district and meets annually to provide input on program needs at NEREC. Other research centers with advisory committees which meet annually include the High Plains Agricultural Lab and the Gudmundsen Sandhills Lab. Examples of programs which have advisory committee meetings which meet at least annually include the Republican River Basin Irrigation Management Demonstration Project and the *E. coli* 0157:H7 Food Safety Research Program.

The Cooperative Extension Division has organized action teams for major program areas to plan and implement educational programs. Many of the members of these action teams are faculty with joint research and extension appointments. In 2002, each action team was required to develop a process for obtaining appropriate stakeholder input for that program area. Results from these processes have resulted in using stakeholder input to direct extension education for the future and research programs which provide the scientific information for the educational programs.

b) Brief Statement of the Process Used by the Recipient Institution to Identify Individuals in Groups Who are Stakeholders and to Elicit Input from Them

The Animal Science Advisory Committee began by familiarizing members with the department's research, extension, and teaching programs. Currently, the Committee is providing input on future needs.

The Department of Nutrition and Health Science (formerly Nutritional Science and Dietetics) meets twice per year with its Community Nutrition Partnership Council. This Council helps to coordinate nutrition education for limited resource audiences. The members of the Council represent a broad group of state and local agencies, volunteer organizations, school officials, and others. They provide valuable input both on extension needs for Cooperative Extension and research needs for these types of programs.

The Department of Biological Systems Engineering advisory council consists of both in-state and out-of-state stakeholders who help to provide perspectives on research and education needs at regional and national levels

The Department of Agricultural Leadership, Education, and Communication's Advisory Council meets twice annually and consists of representatives from clientele groups throughout the state.

The above examples are only a part of the on-going stakeholder process. While the types of membership for these advisory groups vary, in all cases the intent is to have a membership selection process which allows for good representation from all clientele groups and rotation of membership to allow different views to be brought in.

c) **A Statement of How Collected Input was Considered**

In nearly every case with the examples of advisory groups mentioned above, minutes of meetings and reports are maintained and revisited periodically to see if programs are adjusted to respond to the recommendations. It is essential for active advisory groups to continue that the membership is able to review and reflect upon what impact a group has had in earlier recommendations. Stakeholder input has been valuable to units in making decisions on which programs to emphasize or initiate as well as which programs to de-emphasize. Stakeholder input is often critical in helping units and administrators make decisions on which areas are highest priorities for filling faculty positions. Since the filling of faculty positions is a critical element in refocusing programs, reaffirming priorities, or identifying emerging issues to address, the stakeholder input is very valuable in helping units and the Agricultural Research Division in making these decisions. Currently, the new five-year IANR Strategic Plan has been drafted. The plan is based on the results of the listening sessions, reactions and input from the faculty and consideration of federal priorities. The University of Nebraska continues to be involved in a state budget reduction process. Stakeholder input is important in deciding what program areas must be reduced to accomplish the budget reduction.

C. Program Review Process

Nebraska has made no significant changes in program review processes since the 5-Year Plan of Work was submitted. The scientific peer review process used the by Agricultural Research Division as described in the 5-Year Plan of Work remains the same.

IV MERIT AND PEER REVIEW PROCESSES:

Every faculty member with a research appointment in the Agricultural Research Division is required to have a current approved peer-reviewed project which defines his or her area of research investigation. The Project Outline format is attached as Appendix I. The peer review process is consistent with the requirements of the Hatch Act as amended for agricultural experiment station projects. The peer review is required for all projects, whether they're classified as Hatch, State, or Multi-state (formerly regional). Appendix II is a copy of the guidelines for ARD project development and review. After internal departmental review, a peer review panel is appointed and convened to meet with the PI(s), Unit Administrators, and ARD representative. The recommended review questions are attached as Appendix III. Following review and acceptable revision, if necessary, the project outline is forwarded to USDA-CSREES for inclusion in the CRIS database.

Another review process which is a combination of merit and peer review is the review annually by several commodity check-off boards in Nebraska of over 100 funding proposals from ARD faculty. In selecting those proposals for funding which address the most significant problems currently being faced by the producer-members of these boards, there is a clear communication of the relevancy of the research to user needs. This is considered as valuable input to the ARD planning efforts.

V. MULTI-INSTITUTIONAL, MULTI-DISCIPLINARY, MULTI-STATE AND INTEGRATED RESEARCH-EXTENSION ACTIVITIES

Multi-Institutional and Multi-State:

The University of Nebraska is the only university in Nebraska that has a land-grant mission. The University of Nebraska's Institute of Agriculture and Natural Resources (IANR) is also the only Nebraska college or university authorized to deliver agriculture and agriculturally-related programs on a statewide basis. Nebraska has two 1994 land-grant colleges, but these do not currently maintain research programs, so there is no collaborative research underway with them.

Agricultural Research Division faculty currently have several active collaborative research efforts with faculty at the University of Nebraska Medical Center-Omaha (UNMC). The Ph.D. program offered by the IANR Department of Veterinary and Biomedical Sciences is joint with UNMC.

ARD faculty are involved in a large number of multi-institutional research efforts with universities located in other states. These include cooperative or collaborative arrangements of many types. Perhaps the most visible for many years has been the participation by ARD faculty in the former regional research program, under the partial support of the USDA regional research funds, now termed "multi-state". ARD faculty currently participate in 51 multi-state projects of the type eligible for funding support, and in all four of the national regions. They also participate in over 75 multi-state coordinating committees in the four regions, providing immense opportunities for faculty to do multi-state cooperative research. A listing of multi-state projects and committees with current ARD faculty participation is attached as Appendix IV. The ARD has actively encouraged meaningful participation in the multi-state activities.

The USDA funding received by ARD in the former regional research category is allocated on a project by project basis to specifically support faculty participation in multi-state research and to support travel for participation in multi-state committee meetings.

In FY 1998, ARD support for participation in regional research (multi-state) was as follows:

ARD Expenditures in Support of Multi-State (Regional) Research for FY 98

Source of Funds	Expenditures
Federal Formula Funds	
Regional Research	$827,444
Hatch	$347,967
Federal Grant Funds	$108,132
State Funds	$2,493,031
Product Sales	$623,158
Industry Grant Funds	$128,160
Total	$4,527,892

From the above table, it can be noted that the Federal Regional Research funds provided about 18% of the total expenditures for multi-state research. The ARD commitment to formal multi-state efforts is significant, leveraging other support at over a 4 to 1 ratio compared to the regional research funds.

Federal Formula Funds spent on multi-state research for FY 98 totaled $1,175,411 or about 35% of the total formula funds received by ARD of $3,307,474. Funds from other sources spent on multi-state research totaled $3,352,481 actually exceeding the total Federal Formula Funds received and expended by ARD in FY 98.

ARD faculty are also involved in numerous other multi-state activities that are not a part of the former regional research system. Many of these are with institutions in adjoining states, but many others with distant states or at institutions outside the USA. Some examples of the other current multi-state, multi-country activity follow:

The University of Nebraska and Kansas State University have teamed on a research and extension effort to reduce non-point source runoff pollution in the Blue River Basin area of southeast Nebraska and northeast Kansas. Faculty from Nebraska, Kansas State, Iowa State, and Missouri are working on a joint research project to make more effective use of standing forages by beef cattle grazing. Nebraska, Kansas State, and USDA scientists work together closely as part of the Central Plains Grain Sorghum Breeding Program. Nebraska faculty work with faculty from Kansas State and Oklahoma State as well as USDA scientists as participants in the Great Plains Cereals Biotechnology consortium.

At the western end of the state, Nebraska works with Colorado State and Wyoming Universities through the Central High Plains Dry Bean and Sugarbeet Group. This group recently prepared a Dry Bean Production Guide and is working on another for sugarbeets. Another collaboration with Wyoming and Colorado State resulted in the High Plains Integrated Pest Management Guide. Dryland cropping

researchers from Nebraska, Colorado, Wyoming, and USDA have initiated several joint research trials.

On the international scene, examples of current multi-country research include participation by ARD faculty in two USAID-funded Collaborative Research Support Programs (CRSPs), the Bean/Cowpea CRSP, and the International Sorghum/Millet CRSP (INTSORMIL). In these CRSP activities, ARD faculty work with counterpart scientists in the Dominican Republic, Honduras, Puerto Rico, Mali, Niger, Botswana, Namibia, Zambia, and Zimbabwe.

The preceding examples are just a few of the extensive collaborative activities of ARD faculty with other scientists throughout the USA and world. There are also other collaborative relationships with industry scientists. These collaborations are important to enhance the productivity and expand the capabilities of the ARD research program.

Integrated Research and Extension Activities

The Agricultural Research Division and the Cooperative Extension Division have a long tradition of working together. Currently, 96 ARD faculty hold a joint appointment between research and extension. The research component of these appointments range from .25 FTE to .85 FTE, but the average appointment is .5 FTE research and .5 FTE extension. About one-half of these faculty area located in five Research and Extension Centers across Nebraska. These are PhD. trained faculty in tenure leading positions regardless of location. These joint appointments are designed to ensure that Research-based knowledge can be incorporated into extension programs.

The approximate annual investment of ARD funds to support faculty with joint appointments with Cooperative Extension Division is as follows:

Appropriated State and Federal Funds	
Faculty Salaries and Fringe Benefits	$4,660,000
Other Operating Support	3,325,000
Grant and Contract Funds	9,960,000

The approximate total annual ARD support for faculty with joint appointments (Integrated AES-CES activity) is $17,945,000 which is about 34% of the total annual ARD expenditures for research.

For the near future, the Cooperative Extension Division and Agricultural Research Division have identified six priority areas where research and extension faculty will be working to enhance discoveries and strengthen education. These areas include:

- Food Safety *(refer to Goal 2 – Joint Extension/Research Program Component)*
- Integrated Pest Management *(refer to Goal 1 – Joint Extension/Research Program Component)*
- Manure Management *(refer to Goal 4 – Joint Extension/Research Program Component)*
- Precision Farming *(refer to Goal 1 – Joint Extension/Research Program Component)*
- Water Quality with Emphasis on Hypoxia *(refer to Goal 4 – Joint Extension/Research Program Component)*
- Workforce Preparation and Retention *(refer to Goal 5 – Joint Extension/Research Program Component)*

We have teams of faculty working on these critical issues. The teams have identified both research and extension goals they wish to achieve. Extension and research administrators have worked to help

faculty on these teams strengthen already sound linkages between research and extension including joint funding of some programmatic goals.

Multi-disciplinary Activities:

Multi-disciplinary program activity is encouraged and there are several organizational arrangements that help support this. At the outstate Research and Extension Centers previously mentioned, the faculty include multiple disciplines at each center, usually with one or two faculty of each traditional discipline at each center. They're involved in applied research and extension related to the needs of that particular area and multi-disciplinary activity is the normal approach.

Another mechanism to help foster multi-disciplinary activity are the IANR Interdisciplinary Centers. These include Centers for Biotechnology, Food Processing, Grassland Studies, Global Environmental Change, Industrial Agricultural Products, Rural Community Revitalization and Development, Sustainable Agricultural Systems, Water/Environmental Programs, and Communication and Information Technology. These centers serve to bring faculty together from diverse disciplines and departments to work together in dealing with problems that need multi-disciplinary solutions.

The Agricultural Research Division administers an interdisciplinary grant program which has an annual competition for interdisciplinary teams with the best proposals. Interdisciplinary team efforts are recognized and rewarded through the annual IANR Team Effort Award, given to the teams which have outstanding accomplishments.

The ARD administration believes strongly that the "multi" approaches – disciplinary, function, and state – are important to best address the needs of our stakeholders. While not appropriate for every type of research, we encourage these collaborations where possible and try to use resources and a reward system to help in this regard.

IANR is in the midst of developing a new strategic plan, based upon extensive stakeholder input at listening sessions held throughout the state. in early 1999. The new strategic plan will encourage change and continuous improvement. By working as a team, we can make commitments needed to move the research, teaching, extension, and service programs of IANR toward higher levels of contribution in Nebraska, the nation, and the world.