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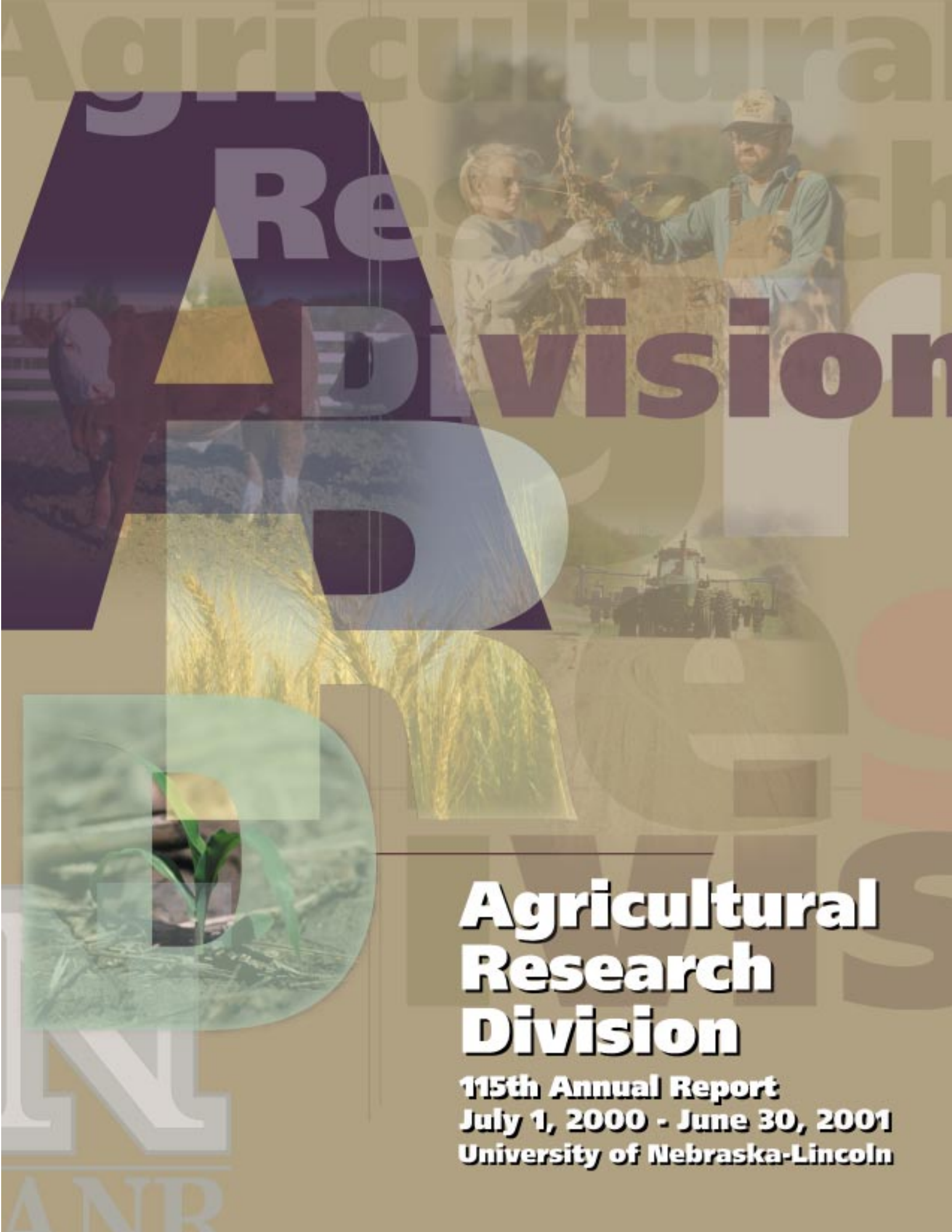

Agricultural Research Division

115th Annual Report
July 1, 2000 - June 30, 2001
University of Nebraska-Lincoln

Agricultural Research Division scientists improve the quality of life for Nebraskans across the state. They make important contributions to the state's agriculture, food industries, environment, the well-being of families and community development. Research occurs in fields, feedlots, the natural environment, homes, yards, gardens, and cities and towns. ARD scientists provide new knowledge and seek answers to Nebraskans' problems and concerns.

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

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Our Mission

The mission of the Agricultural Research Division in the Institute of Agriculture and Natural Resources at the University of Nebraska-Lincoln is to conduct problem-solving and fundamental research that addresses priority issues facing Nebraska's agricultural and food industries; provides the knowledge base essential for managing our natural resources; promotes family well-being and community development; and educates future scientists through hands-on experiences.

Foreword

Darrell W. Nelson

It is a pleasure to provide you with a copy of the 115th Annual Report of the University of Nebraska Agricultural Research Division (ARD). This report is our opportunity to inform you about our research programs and accomplishments and to allow us to assess the progress and effectiveness of our collective efforts to develop new knowledge. After examining this report, we hope that you will agree with our assessment that ARD research has provided new technology and knowledge for Nebraskans that will improve the profitability of our enterprises, better manage our natural resources, enhance environmental quality, and improve our quality of life.

This report provides some highlights of research accomplishments, a listing of scientists and research associates, awards and honors received by our faculty and graduate students, outputs from our research projects, and the ARD financial report for the period July 1, 2000, to June 30, 2001. This report was compiled in compliance with the intent of the law of the State of Nebraska that established the Nebraska Agricultural Experiment Station on March 31, 1887.

Outlined in the Research Highlights section are some of the significant accomplishments of our faculty during the past few years. A few of these include: (I) development of management strategies to reduce heat-stress related deaths in beef feedlots; (II) an understanding of the cultural changes and community stresses resulting from the opening of meatpacking plants in rural communities; (III) development of the first comprehensive map of all 20 soybean chromosomes and resultant identification of genes controlling yield and drought tolerance; (IV) introduction of woody plants in shelterbelts that could be used for decorative florals and wood products in addition to their protective benefits; (V) decontamination of soil polluted with high concentrations of pesticides using a simple, inexpensive process; (VI) development of soybeans with oil that contains up to 90 percent oleic acid — a healthier component; and (VII) a finding that risky lifestyle habits — smoking, excessive alcohol consumption and poor diet — cluster, indicating that new health campaigns will need to target multiple habits.

We continue to be excited about our research programs and the scientists who work diligently to solve today's problems and help provide the knowledge necessary to address the issues that will arise in the future. The ARD was created to serve the people of Nebraska and the nation. We welcome your input on our current research efforts and on your needs for research information.

Darrell W. Nelson
Dean and Director
Agricultural Research Division

The Agricultural Research Division is the only public entity in Nebraska charged with conducting agricultural research. It is part of a national network of state agricultural experiment stations located in Land Grant Universities across the United States. In 1973, the state legislature passed LB 149, which established the Institute of Agriculture and Natural Resources. The Agricultural Research Division was created as one of IANR's six divisions. The state legislation also expanded the federal mandate for agricultural research conducted by the Nebraska experiment station to include research in natural resources, human resources and family sciences. The ARD research portfolio represents a scientific investment in Nebraska's future. ARD research not only solves today's problems, it also defines tomorrow's opportunities.

New management strategies help feeder cattle beat the heat

Hot, still, humid days are potential killers in feedlots. A single, severe heat wave in 1999 cost Nebraska producers more than $20 million in cattle deaths and performance losses.

Management strategies developed through multistate research coordinated by an IANR animal scientist should significantly reduce heat-related losses. Researchers from Nebraska, Missouri, Purdue and USDA's Meat Animal Research Center teamed up on this three-year project to better understand, predict, plan for and prevent heat stress.

IANR Animal Scientist Terry Mader checks cattle as part of his research to find ways to reduce heat-related deaths and performance losses in feedlot cattle.

Eliminating all environmental stress is impractical and costly, but this research shows that easing heat stress greatly reduces death and performance losses.

Combining feedlot and laboratory findings, the team devised recommendations for making cattle comfortable without sacrificing overall performance. They focused on altering feeding routines and the lot's microclimate during hot spells. For example, changing feed schedules and intake during extreme heat keeps cattle cooler, avoids digestive problems and doesn't hurt overall performance.

In the past, severe heat literally forced some Nebraska feeders out of business when they couldn't recover financially from heavy losses. Researchers are confident that implementing these recommendations will keep cattle comfortable and minimize potentially devastating death losses as well as minimize performance losses.

Meatpacking changing rural Nebraska towns

When a meatpacking plant opens in a rural community, change quickly follows.

IANR researchers studied three Nebraska towns where meat processing is a major employer to understand how meatpacking is changing rural communities and how it affects newcomers and longtime residents. They'll use these findings to help other communities facing rapid changes.

They found longtime residents and newcomers share similar concerns about rapid demographic changes altering their communities. Language barriers, drug use, teen alcohol use, housing and youth education are the most common shared concerns.

While longtime and new residents share many concerns, their perspectives are quite different. For example, some longtime residents worry that too many people are living in local houses, while some immigrants complain they live in poor-quality housing.

The study found newcomers reported significantly greater economic strain and greater concern with community issues such as ethnic relations, adult education, drugs, domestic violence, childhood education and alcohol use than longtime residents. Immigrants also reported poorer diets and problems accessing community services such as medical care, food assistance, affordable housing and police protection.

The NU College of Human Resources and Family Sciences researcher who heads this work says communication stands out as a barrier to intercultural collaboration.

The latest U.S. Census shows Nebraska's growing diversity. Findings could influence policy, education and social services to help other communities as they become more diverse.

Soybean Geneticist Jim Specht examines soybean DNA patterns in his lab. Specht and some of his colleagues recently created the first comprehensive genetic map of all 20 soybean chromosomes.

IANR soybean team helps devise genetic map

The first comprehensive genetic map for all 20 soybean chromosomes, created by an IANR soybean geneticist and his colleagues, is an invaluable resource for soybean genomics researchers.

It's already leading to exciting discoveries, such as NU research on the genes controlling soybean yield and drought tolerance.

The IANR lab developed one of three soybean populations used to construct the map, which locates genes to certain segments of the individual chromosomes. Once the researchers had located specific segments, they flanked these with genetic markers. Genetic markers are either genes that code for readily identifiable plant traits or special DNA segments used for easy identification. More than 1,800 genetic markers now serve as "landmarks" on the soybean map.

The genome map is especially useful to plant breeders because it allows a more targeted approach to developing improved soybeans. A breeder with a genetic marker linked to a specific trait in a parent can see which offspring have the marker; if it's there, so is the desirable gene. This is especially useful for complex traits, such as yield, controlled by many genes.

Team eyes potential impacts of MTBE, ethanol contamination

A new method for detecting minute traces of MTBE and ethanol in water is helping IANR researchers better understand potential environmental and health impacts of these gasoline additives.

Nebraska researchers enhanced an existing lab technique to create an extremely sensitive test for these gasoline oxygenates in groundwater or surface water. This detects MTBE at the low parts per billion levels and ethanol at the low parts per trillion. IANR researchers are working on ways to enhance its accuracy and efficiency.

Researchers are using this test to better assess the environmental impact of vehicle emissions and gasoline spills on groundwater quality. They're studying the occurrence of ethanol and MTBE in groundwater along the Interstate 80 corridor in Nebraska and Colorado as well as checking natural levels of these oxygenates in isolated rural areas.

This study was prompted by concerns about MTBE's adverse health impacts on drinking water, including the need to assess the extent of the problem and find ways to clean it up. Less is known about ethanol's potential health risks. Some scientists worry that it could hamper the ability of naturally occurring microbes to degrade toxic contaminants in gasoline spills.

The IANR-developed detection method could help stop fuel spills or leaks and could be used to devise ways to clean contamination before it becomes widespread.

Turning eggshell waste into dietary supplements

Where others see waste, NU poultry scientists see raw material for a dietary phosphorus supplement for poultry, pigs and pets.

IANR researchers developed a process that turns eggshells into a supplement equivalent to monocalcium or dicalcium phosphate, the most common phosphorus supplements for livestock. The university has filed a patent on this process.

U.S. egg processors and hatcheries generate nearly 190,000 tons of shells annually. Nebraska is among the nation's leading egg processing states. Shells from plants at Bloomfield, David City and Wakefield are spread on land as calcium fertilizer or reprocessed as a calcium source for poultry. In states with less ag land, shell disposal in landfills runs $20 to $40 per ton.

Researchers estimate eggshell-derived phosphorus supplements could be worth $250 or more per ton compared with $40 per ton as a

calcium source in chicken feed.

Typically, limestone and phosphoric acid are mixed to produce monocalcium and dicalcium phosphate. The IANR researchers use eggshells instead of limestone and mix it with phosphoric acid to create a product containing the same amount of phosphorous as conventional supplements.

Research shows shell-based supplements perform as well or better than dicalcium phosphate in chicks and laying hens. They also could be used in pet and swine feed. Researchers are exploring the potential for commercialization.

Lots more trees would significantly impact Sandhills

Across the Great Plains, as in grasslands worldwide, trees and shrubs are encroaching or growing denser.

While some trees are added for good reason, such as shelterbelts, trees are expanding on their own in many areas with significant implications.

The world's largest planted forest, in the midst of the Sandhills, gives NU scientists a unique laboratory to study implications for grassland ecosystems when trees and shrubs encroach.

The Nebraska National Forest near Halsey was once treeless prairie. Comparing plots ranging from dense pine forest to native prairie, an IANR forest ecologist and UNL School of Natural Resource Sciences colleagues are exploring what happens to grass production, soil moisture, groundwater recharge and carbon storage as tree density increases. Findings could be useful to other grasslands across the West and perhaps worldwide.

Graduate student Xiaoping Ding (right) and Forest Ecologist David Wedin plant tree seedlings in a test plot. Their preliminary findings indicate tree encroachment or planting could reduce Sandhills' groundwater supplies by using water that now recharges the acquifer.

This research shows dense forest holds about four times more carbon than Sandhills prairie, while scattered, open forest stores twice as much. However, large-scale tree planting would likely threaten the Sandhills' most valuable resources — grass and groundwater.

Preliminary findings indicate large-scale tree encroachment or planting could reduce groundwater supplies by using water that now recharges the aquifer.

Eventually, scientists will use remote sensing and computer modeling to predict what tree planting or encroachment on different scales would mean to water, forage production and carbon storage.

Faster winter gains more profitable in the long run

Overwintering calves on low-cost forage to gain slowly may save feed costs but isn't the most profitable in the long run.

IANR animal science research found slow winter gainers don't fully compensate by gaining more weight while grazing summer grass and never catch up with calves fed for faster winter gains. Faster winter gains lead to heavier weights when yearlings enter feedlots in the fall and more profit at slaughter.

This research shows that winter gains deserve more attention because summer compensatory gain may not be as significant in overall weight gain as earlier studies indicated.

Compensatory gain for slow winter gainers runs 20 percent to 30 percent. Steers fed for faster winter gains maintain up to 80 percent of their weight advantage entering the feedlot after summer grazing.

This four-year study was part of ongoing research on economical, sustainable beef growing and finishing systems that maximize forage and minimize grain use. The idea behind the forage-based yearling growing/finishing system is to add value to calves using resources readily available on Nebraska farms and ranches by growing calves after weaning on grass, crop residues, forages and byproducts. Yearling system calves are wintered mainly on cornstalks or other forages and graze grass in summer before finishing on grain in a feedlot instead of being placed in feedlots soon after weaning.

One-of-a-kind program aids cattle breeders

An IANR program helps cattle breeders catch genetic problems before they devastate herds.

NU's Cattle Congenital Disease Program identifies cattle carrying abnormal recessive genes that cause deformity and death. When a producer reports a suspected genetic problem, a veterinary pathologist at IANR's Veterinary Diagnostic Center begins the genetic detective work: discovering similar cases, collecting data on symptoms, gathering blood samples for DNA testing and analyzing pedigrees. The center tackles as many as 80 genetic disease cases annually.

It's difficult for producers to identify cattle that are carrying

and passing on the recessive genes. When a mutation occurs, it can be carried silently along for generations, showing up only when a sire and a dam both carry the abnormal recessive genes. Then, one-quarter of their calves will be affected and have deformities.

When this happens, producers are counseled to take the expensive step of destroying the carriers of the gene. It's tough, but necessary. Identifying, reporting and removing confirmed carriers help keep genetic diseases in check.

Breeders and breed associations heavily use the program. They learned the importance of catching genetic abnormalities in the 1950s when dwarfism became a major problem in the Hereford and Angus breeds.

Smoking, drinking, poor diet — bad habits cluster

Cigarette smoking, excessive alcohol use and poor eating habits tend to reinforce each other, Nebraska research shows.

An IANR nutrition science team found that bad habits tend to cluster. People with one tend to have the others, too. Compared with non-smokers, smokers tend to eat fewer foods rich in protective antioxidants, eat more high-fat foods and drink more alcohol.

This research also showed that smokers who drink more heavily tend to make unhealthy food choices, too. The study defined liberal drinking as more than two alcoholic drinks daily for men and more than one drink daily for women. Alcohol substitutes for food among smokers who drink heavily.

Analyzing health habit diaries of nearly 7,000 American adults, researchers found that the more participants smoked or drank each day, the fewer nutritious foods they ate. Smokers ate fewer fruits and vegetables and more fatty foods than the non-smokers studied.

These behaviors are so interconnected that people have trouble kicking one habit as long as they're continuing the others. However, many public health campaigns target one bad habit at a time and have met with limited success.

Findings from this College of Human Resources and Family Sciences research could help design more new health campaigns to target multiple lifestyle habits.

Timing is key to effective weed control

When it comes to post-emergent weed control, timing is everything, according to IANR research. Applying weed control measures at the right moment can save time and money.

IANR weed scientists found that each crop has a critical period during which weeds must be controlled to prevent yield losses. Weeds that emerge before or after the critical period may not present a threat to yields.

In corn, researchers found that applied nitrogen significantly influences the timing and duration of the critical period. Less nitrogen means longer critical periods and less crop tolerance for weeds. When no nitrogen was applied, weed control was necessary from eight to 45 days after crop emergence. With 210 pounds of applied nitrogen, the window is shortened to 20 to 39 days after emergence.

The team concluded that increases in nitrogen reduced the competition between corn and weeds for nutrients, allowing corn to tolerate weed presence longer.

In soybeans, row spacing influences the critical period. The wider the row spacing, the earlier weed control is needed, this research showed. Farmers can gain eight to 12 more days to control weeds by planting in 7.5-inch rows instead of 30-inch rows.

Findings will help farmers maximize their weed control dollars and apply fewer chemicals to their fields.

Tortilla-making process reduces wastewater concerns

An IANR food scientist has devised a way to make corn tortillas that's kinder to the environment and still produces the high-quality flour the market demands.

Graduate student Sean Evans counts weeds and compares their size to the soybeans in a test plot. IANR research shows that each crop has a critical period during which weeds must be controlled to avoid yield losses.

The traditional process for making corn tortillas requires steeping and cooking corn in a lime solution. This creates highly alkaline wastewater that must be treated to avoid environmental problems.

The IANR researcher developed a novel process, using naturally-occurring enzymes, that reduces the amount of alkaline wastewater and requires less lime, energy and water for cooking and steeping corn. It does all of this without requiring processors to invest in new equipment. NU has applied for a patent on the process.

The enzyme system used is a low-cost, food-grade, commercially-available product that works by shortening the cooking process, the step that requires excess water. The new process not only reduces waste generation at its source, minimizing the need for investment in expensive waste treatment systems, it also produces more corn product because less corn is lost in the waste.

Research helps explain strong rural work ethic

Different factors motivate different people. Understanding those motivational differences can help create a better workplace.

An IANR leadership researcher is helping explain what motivates different people in the workplace. He developed the Motivational Sources Inventory to reveal workers' primary sources of motivation. Since joining NU, he uses this tool in his IANR research.

His inventory identifies five main motivational sources. Everyone is motivated to some extent by each of the five, but most people have a prime motivation.

He found that nearly 40 percent of Nebraska agriculture workers are predominately self-concept internally motivated. A desire to meet personal standards characterizes this motivation. People primarily motivated in this way seek the most difficult, important tasks and perform them with little instruction.

The dominance of self-concept internal workers in leadership and management positions in Nebraska agricultural operations explains why working hard to produce quality results is considered status quo. An abundance of self-concept internal workers also may spark conflict because these people expect employees or co-workers to exhibit similar dedication.

Supervisors can motivate self-concept internals by assigning challenging work requiring expertise, cultivating skills and not assigning menial or mundane tasks.

Forest scientist Scott Josiah checks a shrub in a test plot. He's exploring the income potential of trees and shrubs in conservation plantings.

Conservation plantings: protection and income, too

Shelterbelts, buffer strips and living snow fences could be a source of income as well as protection.

An IANR forest scientist is exploring the income-producing potential of various trees and shrubs that are or could be grown in Nebraska windbreaks, conservation buffer strips along streams that protect water quality or in living snow fences.

While such plantings' environmental benefits are well-documented, landowners sometimes view these areas as unprofitable. They might be more willing to use such plantings if the plants provided some income.

Woody plants could do double-duty. Besides traditional protective benefits, they could be harvested for decoration, food production, medicinal or specialty wood uses to supplement income.

In field trials around Nebraska, researchers are testing about 45 woody plant species for yield, production costs, revenues and markets. While many woody plants will grow in Nebraska, researchers are concentrating on the ones that produce marketable products.

Preliminary research indicates woody plants for decorative florals and food products look most promising.

Recommendations for Panhandle dryland corn

When dryland corn acreage boomed in the Panhandle following a string of wet summers and a change in the federal farm program, agronomists at NU's Panhandle Research and Extension Center saw a need for data on recommended plant populations and fertility levels.

Dryland corn acreage in the Panhandle grew from 5,000 acres in 1995 to more than 100,000 in 2000.

The Panhandle is wheat country. The only available dryland corn recommendations were developed at NU's West Central Research and Extension Center in North Platte, where conditions are much different.

The IANR researchers ran a two-year study looking at the effects of plant population and nitrogen fertilizer on dryland corn in Banner, Cheyenne, Kimball and Box Butte counties. They found applying 60 pounds of nitrogen per acre at planting was optimal at all sites. They recommend a population ranging between 15,000 and 19,000 plants per acre. Growers with sites that usually yield 50 bushels or better can benefit most from the higher population, the study showed.

Eyeing potential of transgenic high-oil soybeans

Soybean lines with high oleic acid content developed by an IANR team could be the basis for future biodiesel fuels, healthier cooking oils and more stable commodity oils.

IANR soybean researchers, plant scientists and biotechnologists are collaborating to produce and evaluate genetically modified, high-oleic acid soybean lines. The modified plants, containing a gene that revs up oleic acid production, have 80 percent to 90 percent oleic acid content, compared with 15 percent to 20 percent in conventional soybeans.

NU is seeking a patent on the technique used to produce the plants, involving a patented gene from the DuPont Corp., that turns off two genes in soybean cells, allowing cells to increase oleic acid content.

The genetically modified cells are grown into whole plants using tissue culture techniques, then screened to determine which have the most oleic acid at the Plant Transformation Core Facility in UNL's Center for Biotechnology. UNL is one of the few facilities worldwide with the expertise to successfully perform this complex process.

Seeds from these transgenic lines are packed with oleic acid. But real economic potential lies in their ability to become high-yielding, well-adapted varieties. IANR soybean breeders are evaluating the lines for stability, seed traits and plant characteristics. They then cross them with high-oil producing, high-yielding conventional soybean lines and evaluate the offspring. Researchers now are concentrating on producing enough oil for larger-scale testing.

IANR scientists have teamed up to produce and evaluate genetically modified soybeans that are high in oleic acid. Here, Soybean Breeder George Graef checks soybeans in a greenhouse.

Simple treatment decontaminates soil inexpensively

Cleaning soil contaminated with pesticide typically is a complex and expensive process. Nebraska researchers think they have a better approach.

IANR environmental chemists are perfecting a method of mixing iron and water into pesticide-contaminated soil. They've successfully field tested this less expensive, simple cleanup system.

Research indicates their technique reduced pesticide concentrations in soil by up to 95 percent, which allows soil to be returned to the ground. The technique is readily adaptable to different contamination situations, is environmentally safe and requires minimal personnel training or special equipment.

Treating soil on-site with the NU-developed method can cost as little as 2.5 cents per pound of soil compared with $1 per pound or more for methods that remove, transport and incinerate contaminated soil.

The technique involves windrowing soil with earth-moving equipment and then mixing it with a high-speed soil mixing and fracturing implement. Iron particles and water are added in the mixing operation. Windrows are covered with plastic sheeting and kept

moist for three months. Within 42 days of treatment, soil metolachlor concentrations at one site decreased by as much as 95 percent.

Researchers continue testing the technique. They want to be able to predict how well iron will work on a variety of compounds, based on the chemical structure of the contaminant.

Assessing, classifying water quality in Nebraska lakes

NU scientists are classifying Nebraska lakes based on water quality in research that could lead to a model lake ranking system useful in agricultural areas nationwide.

Water scientists, engineers, remote sensing experts and geoscientists are sampling lakes across the state to collect information that will help them develop a lake classification procedure. Eventually, they'll build their findings into software to rank lakes according to quality.

Among other things, they're identifying how to assess the impact of human activities, such as farming, on different Nebraska lakes. They'll also group lakes based on similar water quality and study how to maintain or improve quality.

Remote sensing and global information system technologies to monitor lake conditions and improvements are key to the project. They want to find ways to check lake conditions from aircraft or satellites.

Research Technician Mary Shipman removes a test loaf of bread from the oven at NU's Nebraska Wheat Quality Laboratory. As part of a five-year study, Shipman tested milling and baking qualities of wheat grown using different amounts of fertilizer.

They're exploring biological indicators of water quality, such as certain algae or plankton, that could be detected using remote sensing technologies.

Eventually, this lake classification procedure could be useful nationwide, especially in agricultural areas. The U.S. Environmental Protection Agency, which funds this research, hopes this classification system will help provide a framework for making decisions about how best to protect or restore lakes.

Fertilizing dryland wheat boosts yields, grain quality

Boosting nitrogen fertilizer rates on dryland wheat not only increases yields, it improves grain end-use quality and protein content, which can mean premium prices for growers.

These are among the findings of a comprehensive five-year IANR study of nitrogen fertilization's effects on wheat quality, yield and protein content.

Results are being used to formulate fertility recommendations for growers interested in producing high protein wheat, which fetches premium prices in export markets.

To study the effects of nitrogen nutrition on wheat quality characteristics, such as protein, dough-mixing time and dough strength, a team of NU agronomists applied nitrogen rates of 0 to 100 pounds per acre to top winter wheat varieties. Grain tests showed that increased nitrogen fertilization boosted yields, grain protein content and dough strength, and reduced dough-mixing time.

Rural residents not big on cybershopping

Rural residents prefer bricks-and-mortar stores to cybershopping, IANR research shows.

Less than 20 percent of rural people surveyed in 11 states, including Nebraska, use the Internet or television shopping channels to buy food or clothing, according to the IANR merchandise management researcher who studied rural buying habits.

Rural residents shop mostly at retail stores and travel an average of about 17 miles to the nearest shopping area. Nebraska's responses were similar to the larger sample.

This College of Human Resources and Family Sciences research is part of an 11-state examination of technology's impact on rural consumer access to food and fiber products. To detect changes over time, they'll survey the same people again in winter 2002-2003.

Survey respondents were more satisfied with traditional retail shopping than other forms. They were lukewarm toward Internet and television shopping. Credit card security and Internet access are key to their reluctance.

More than half of those surveyed had Internet access, although more than 52 percent didn't have a personal computer at home. More than 60 percent reported using the Internet once within the last year, while nearly half don't use it at all.

Findings may help decision makers develop electronic commerce policies and help rural businesses and communities adjust to potential changes in consumers' buying habits.

a few more glimpses at ARD research ...

- Switching weed control efforts from spring to fall can significantly improve perennial weed control. IANR weed science research shows that applying herbicides after the first fall frost provides the best control by disrupting the plants' overwintering ability. Traditionally, farmers apply herbicides in the spring when weeds emerge, killing about half of the weeds. Applying herbicides in the fall after the first frost can kill up to 90 percent of the weeds.

- The latest Nebraska Rural Poll showed that nearly two-thirds of rural Nebraskans say their income hasn't kept pace with the cost of living and 61 percent faced at least one economic hardship in the past year. For the past six years, IANR researchers in the university's Center for Applied Rural Innovation have surveyed rural Nebraskans about quality of life and policy issues. These and other poll results provide a rural perspective for decision makers, lawmakers and others making public policy choices and planning for the state's future.

- An entomology graduate student's discovery is helping beekeepers check their hives for potentially devastating varroa mites. Her IANR research found that dusting caged honey bees with powdered sugar and shaking them in a canning jar with a screened lid is a fast, inexpensive way to detect the mites. She came up with the idea while seeking an easier way to gather mites from bees for lab tests. Commercial beekeepers now use her technique for early detection, which is key to preventing mite infestations from destroying honey bee colonies.

- Lake Ogallala is a well-known Nebraska trout fishing spot, but low dissolved oxygen levels sometimes contribute to fish kills. NU, state and private researchers are teaming to determine what causes this periodic problem and to find ways to solve it. They've extensively studied and sampled the lake. They've also constructed a scale model to reproduce the lake's water flow patterns and characteristics and experiment on how to improve conditions for fish. The team will use findings to develop recommendations on what should be done to protect the lake's water quality.

- An IANR climatologist's study of 111 years of Nebraska rainfall indicates we may be entering a dry decade. Highly sophisticated data analyses and advanced computer modeling data revealed a 20-year precipitation cycle of alternating wet and dry decades. The 1990s were a wet period. Farmers shouldn't worry yet, though. The study also showed "less organized precipitation patterns" emerging in the last 20 years. That may mean a changing cycle or could be an oddity that disappears when data is analyzed 10 years from now.

- IANR research on nematodes may lead to recommendations about ways to manage agricultural ecosystems using fewer or no pesticides. As part of a multiuniversity research project, NU plant pathologists are documenting all nematodes at undisturbed sites in the Konza Prairie in Kansas. The Nebraska team is a leader in developing molecular techniques for nematode identifi cation. About 10 percent of the species identified so far appear to be previously unidentified. The researchers also study nematodes in Nebraska at Nine-Mile Prairie and Homestead National Monument.

- Raccoons living in residential areas can impact public health. An IANR veterinary epidemiologist teamed with colleagues from across the country to study raccoons in Illinois suburbs and parks. They found that 50 percent of the raccoons tested positive for leptospirosis, a bacterial disease that can affect humans and animals. A high percentage of the raccoons also tested positive for canine distemper.

- Spring-born heifers developed for slower weight gain before first breeding had pregnancy rates and calf weaning weights similar to heifers developed for higher weight gain in a three-year study at NU's Gudmundsen Sandhills Laboratory. Animal scientists found feed costs were 20 percent less for developing the slower gaining heifers. That means producers might be able to reduce heifer development costs.

- Two new prairie clover selections publicly released by NU will soon find their way into home gardens. A purple-flowered selection, called Stephanie, features dark green foliage and upright stems. The other, a light pink-flowered variety called Sandhills Satin, has silky foliage and stems that bend gracefully. It is best-suited for sandy soils and is named for its nativeness to the Nebraska Sandhills.

- An IANR textiles chemist's research is helping the textiles industry add color to new biodegradable fabrics derived from corn. She developed a formula for dying fabrics made with polylactic acid, or PLA, a water-resistant biodegradable resin made from cornstarch. She and a graduate student tested dyes and identified two that held up to sunlight and launderings. Industry has expanded this IANR research, identifying ways to produce a wide range of colorfast shades on PLA fabrics.

- NU's Veterinary Diagnostic Center took on nearly 12,000 cases in 2000, about 986 per month. The IANR center processes animal disease cases from Nebraska and across the nation, helping to diagnose, respond to and prevent disease outbreaks. Cases come from traditional livestock producers, veterinarians, zoos, parks and family homes.

Faculty Awards and Recognitions

The impact and quality of ARD research can be assessed in many ways. One measure of excellence is the recognition researchers' work receives from peers and from those who benefit from the research. A number of ARD faculty members are widely recognized as leaders in their disciplines, and a number received international, national, regional and/or state honors.

Many ARD faculty also serve as officers or directors in their professional societies and state, regional, national and international organizations. Some are editors and associate editors of professional journals. We applaud their efforts in furthering the knowledge and professionalism of their disciplines.

Agricultural Economics

Sam Cordes received the Graduate Alumni Achievement Award from the Graduate School of Washington State University.

Azzeddine Azzam was named research fellow of the Economic Research Forum.

Agricultural Leadership, Education and Communication

John E. Barbuto Jr. received the Junior Faculty Excellence in Research Award from the Agricultural Research Division.

Agronomy and Horticulture Department

P. Stephen Baenziger received the Crop Science Research Award from the Crop Science Society of America.

Kenneth G. Cassman received the Robert E. Wagner Award, Senior Scientist category, from the Potash and Phosphate Institute.

Achim R. Dobermann received the Plaque of Appreciation from the Department of Agriculture, Government of the Philippines.

John W. Doran received the Onassis Prize for the Environment for his research in the development of soil-quality indicators from the Onassis Foundation in Athens, Greece.

Roger W. Elmore was elected Board Representative of the North Central Branch of the American Society of Agronomy.

Charles A. Francis received the Seventh Generation Research Award in Agriculture from the Center for Rural Affairs and the Consortium for Sustainable Agriculture Research and Education.

Kulvinder S. Gill received the Junior Faculty Excellence in Research Award from the Agricultural Research Division.

Stevan Z. Knezevic received the Novartis Crop Protection Recognition Award from the American Society of Agronomy.

Dennis L. McCallister was elected Faculty Chair, Subdivision A-1a (Student Activities) of the American Society of Agronomy.

Martin A. Massengale received the Exemplary Service to Agriculture Award from the Nebraska AgRelations Council. Massengale served on the National Advisory Board and its Executive Committee to the U.S. Secretary of Agriculture for Research, Extension, Education and Economics (NAREEE); serves on the Board of Directors and Executive Committee for the Council of Agriculture Science and Technology (CAST); serves as Chairman of the Board of the Agronomic Science Foundation; serves as the Secretariat for the Filippo Maseri Florio World Prize for Distinguished Research in Agriculture; serves as a member of the National Advisory Board for TreesAmerica; serves as a member of the Board of Directors and Executive Committee of the University of Nebraska Technology Park; and serves as a member of the Board of Directors for the Center for Human Nutrition.

Darrell W. Nelson (left), Dean and Director, Agricultural Research Division, presents John (Jay) Barbuto, Jr. Agricultural Leadership, Education and Communication Department, with the Junior Faculty Excellence in Research Award.

Animal Science

Donald Beermann served as President of the American Society of Animal Science.

Chris Calkins received the Prime Promoter Award from the Nebraska Beef Council, received the Research Award from the Nebraska Chapter of Gamma Sigma Delta, and was selected Chair of the Meat Science Program of the American Society of Animal Science Annual Meeting.

Thomas Jenkins received the Animal Management Award from the American Society of Animal Science.

Jeff Keown was inducted into membership by the Alpha Phi Chapter of Phi Beta Delta, the Honor Society for International Scholars.

Terry Klopfenstein served as Past President of the American Society of Animal Science and was named President-Elect of the Federation of Animal Science Societies.

Rick Koelsch was inducted into membership by the Nebraska Chapter of Gamma Sigma Delta.

Roger Mandigo received the R.C. Pollock Award from the American Meat Science Association and received a Special Recognition Award from the American Meat Science Association.

Irv Omtvedt received the Louise Pound-George Howard Distinguished Career Award from the University of Nebraska-Lincoln and an Agriculture Achievement Award from the Nebraska Poultry Industries.

Sheila Scheideler received the American Feed Industry Association Nutrition Research Award from the Poultry Science Association.

Dale Van Vleck received the Award of Merit from the Nebraska Chapter of Gamma Sigma Delta.

Biochemistry

Ruma Banerjee received a Pfizer Award from the American Chemical Society and was honored as an Established Investigator by the American Heart Association. She served as a regular member in an NIH Study Section (Biochemistry) and was invited to join the editorial board of Chemical Reviews.

Raymond Chollet served as an invited peer-review panelist for the U.S. National Science Foundation's Molecular and Cellular Biosciences Division in Arlington, VA, and was reappointed for a fourth consecutive, three-year term on the Editorial Committee of Archives of Biochemistry and Biophysics.

Stephen Ragsdale served on a peer review panel (Metallobiochemistry) for the National Institutes of Health and on the editorial boards of The Journal of Biological Chemistry, Journal of Bacteriology, Archives of Biochemistry and Biophysics and Biofactors.

Robert J. Spreitzer was elected Chair of the Minisymposium on Enzymology, Annual Meeting of the American Society of Plant Physiologists, San Diego, CA, and serves on the editorial board of Plant Physiology.

Darrell W. Nelson (left), Dean and Director, Agricultural Research Division, presents Kulvinder S. Gill, Agronomy and Horticulture Department, with the Junior Faculty Excellence in Research Award.

Biological Systems Engineering

Brian Benham was selected as the recipient of the Dinsdale Family Faculty Award from IANR.

Richard Koelsch was inducted into University of Nebraska Gamma Sigma Delta.

Jack Schinstock received the Superior Academic Advising Award from the College of Agricultural Sciences and Natural Resources.

Dennis Schulte received the Holling Distinguished Teaching Award from the College of Engineering and Technology.

William Splinter received the Distinguished Service Award from the NU Alumni Association.

LaVerne E. Stetson received the Evelyn E. Rosentreter Standards Award from the American Society of Agricultural Engineers.

Entomology

Fred Baxendale was named an Honorary Admiral in the Great Nebraska Navy as a panelist on Backyard Farmer.

Leon Higley received the Distinguished Achievement in Teaching Award from the Entomological Society of America, Certificate of Recognition for Contributions to Students from the University of Nebraska-Lincoln Teaching Council and Parents Association, and the R1edu.org Distance Education Award from the R1edu, a consortium of 30 R1 universities, and served as secretary of the Crop and Urban Pest Management Section of the Entomological Society of America.

David Stanley was selected to serve as the Executive Editor of Archives of Insect Biochemistry and Physiology.

Food Science and Technology

Susan Hefle received the 2000 Samuel Cate Prescott Award from the Institute of Food Technologists.

Veterinary and Biomedical Sciences

Jeffrey Cirillo received the Dinsdale Family Faculty Award for outstanding teaching, research and outreach from the Institute of Agriculture and Natural Resources.

D. Dee Griffin received the Nebraska Veterinary Medical Association President's Award.

Dale Grotelueschen received a Distinguished Service Award for contributing to outstanding service to the advancement of veterinary medicine in all aspects of the profession by the Nebraska Veterinary Medical Association.

Family and Consumer Sciences

Sheran Cramer received the Leader of the Year Award from the Nebraska Association of Family and Consumer Sciences and the Diamond Professor Award from the University of Nebraska at Omaha.

Carolyn Edwards was appointed Institute Faculty Member of the National Head Start Child Development Institute, Washington, D.C.

Julie Johnson received the American Association for Family and Consumer Sciences Leader Award.

Textiles, Clothing and Design

Shirley Niemeyer, Carol Welte, and **Rebecca Versch** received the Outstanding Community Contributions Regional Team Award for Environmental Education from the National Association of Family and Consumer Sciences.

Northeast Research and Extension Center

Stevan Knezevic received the Novartis Crop Protection Award from the American Society of Agronomy and the Layman Research Award from the Institute of Agriculture and Natural Resources.

William L. Kranz received the State Team Award for the Conservation Reserve Program to Crops Team from Epsilon Sigma Phi in recognition of "an outstanding effort of producing useful research and transferring the findings to clientele."

Charles A. Shapiro received the State Team Award for the Conservation Reserve Program to Crops Team from Epsilon Sigma Phi in recognition of "an outstanding effort of producing useful research and transferring the findings to clientele."

David P. Shelton received the State Team Award for the Conservation Reserve Program to Crops Team from Epsilon Sigma Phi in recognition of "an outstanding effort of producing useful research and transferring the findings to clientele."

John F. Witkowski received the State Team Award for the Conservation Reserve Program to Crops Team from Epsilon Sigma Phi in recognition of "an outstanding effort of producing useful research and transferring the findings to clientele."

Graduate Student Awards and Recognitions

One of the primary missions of the ARD research program is to develop the scientists of tomorrow. We are committed to providing exceptional graduate students with the opportunity to work with and learn from our research faculty.

ARD is among the national leaders in research in food production and processing, natural resources management and family sciences. Approximately 733 graduate students are pursuing advanced degrees with ARD faculty. The quality of our graduate students is reflected in the recognition they receive.

Agricultural Economics

Wendy Umberger received the Dr. James B. Hassler Award for Outstanding Research from the Department of Agricultural Economics.

Agronomy and Horticulture Department

Brigid Amos received the Widaman Trust Distinguished Graduate Assistant Award from the Agricultural Research Division.

Hikmet Budak received the Milton E. Mohr Fellowship from the Center for Biotechnology.

Mike Burton received the Irvin A. and Agnes E. Nelson Memorial Fellowship from the Agricultural Research Division and the College of Agricultural Sciences and Natural Resources.

B. Todd Campbell received the Widaman Trust Distinguished Graduate Assistant Award from the Agricultural Research Division, the Milton E. Mohr Fellowship from the Center for Biotechnology, and the John W. McDonald Fellowship from the Office of Graduate Studies.

Andrea Ebmeier received the Pioneer Fellowship from Pioneer Hybrid International.

Sean Evans received the Henry M. Beachell Fellowship from the Department of Agronomy and Horticulture.

Neil Heckman received the 2000 Watson Fellowship at the Golf Course Superintendent's Association of America (GCSAA) 72nd International Golf Course Conference and Show from the Toro Company and the GCSAA Foundation, the Hazel V. Emley Fellowship, and the Shear-Miles Fellowship from the Agricultural Research Division.

Kara Hilgenfeld received 1st Place in the Graduate Student Paper Contest at the North Central Weed Science Society.

Adam Johnson received 2nd Place in the Graduate Student Paper Contest at the North Central Weed Science Society.

Alex Moreno-Sotomayer received the Widaman Trust Distinguished Graduate Assistant Award from the Agricultural Research Division.

Justin Morris received a Mary and Charles Cooper/Emma Sharpless Fellowship from the Agricultural Research Division and the College of Agricultural Sciences and Natural Resources.

Eric Mousel received the Arthur William Sampson Fellowship in Nebraska Pasture and/or Range Management from the Center for Grassland Studies, the W.R. Chapline Fellowship from the Department of Agronomy and Horticulture, and a grant-in-aid from the Center for Great Plains Studies.

Nedim Mutlu received the Widaman Trust Distinguished Graduate Assistant Award from the Agricultural Research Division.

Kimberly Pavelka received the David H. and Annie E. Larrick Memorial Fellowship from the College of Agricultural Sciences and Natural Resources.

Iskender Tiryaki was the alternate for the Henry M. Beachell Fellowship in the Department of Agronomy and Horticulture.

Aaron Waltz received the Henry M. Beachell Fellowship from the Department of Agronomy and Horticulture and 1st Place in the Graduate Student Poster Contest at the North Central Weed Science Society.

Brandon Wardyn received the Mary and Charles Cooper/Emma Sharpless Fellowship from the Agricultural Research Division and the College of Agricultural Sciences and Natural Resources.

Yi Zhang received the Widaman Trust Distinguished Graduate Assistant Award from the Agricultural Research Division.

Animal Science

Kelly Creighton received the Widaman Trust Distinguished Graduate Assistant Award from the Agricultural Research Division.

Bruce DeGroot received a V.H. Arthaud Travel Award from the Department of Animal Science.

Brad Edeal received a V.H. Arthaud Travel Award from the Department of Animal Science.

Kim Franzen received a Graduate Student Award for Outstanding Poster Presentation from the Poultry Science Association.

Dana Hanson received the John Hallman Memorial Award from the Department of Animal Science.

Simone Holt (Mader co-supervised student from UQG) received the Junior Science Award from the Australian Society of Animal Production.

Karen Killinger received the Second Place Award in the American Meat Science Association M.S. Poster Paper Competition.

Gonzalo Martinez received the Ned S. and Esther B. Raun International Graduate Fellowship from the Department of Animal Science.

Ryan Mass received a V.H. Arthaud Travel Award from the Department of Animal Science.

Curtis Novak received the Mussehl Graduate Scholarship from the University of Nebraska.

Uaichai Puthponsiriporn received a Graduate Scholarship from Continental Grain.

Janice Rumph received a V.H. Arthaud Travel Award from the Department of Animal Science and the Milton E. Mohr Fellowship from the College of Agricultural Sciences and Natural Resources.

Biochemistry

Horatiu Olteanu received the Bukey Memorial Award and the Milton Mohr Fellowship from the Center for Biotechnology.

Sebastian Oltean received the Milton Mohr Fellowship from the Center for Biotechnology.

Emily Ross received the Hardin Graduate Research Fellowship from the Agricultural Research Division and a Warren F. and Edith R. Day Student Aid Fund Award from the Dean of Graduate Studies, University of Nebraska.

Biological Systems Engineering

Alejandro Amezquita received an Othmer Fellowship from the University of Nebraska Foundation.

Jeff Ehrhardt received the Milton E. Mohr Fellowship from the College of Engineering and Technology.

Matt Helmers received the Milton E. Mohr Fellowship from the College of Engineering and Technology.

Sandun Fernando received the Milton E. Mohr Fellowship from the College of Engineering and Technology.

Xiodan Song received the Milton E. Mohr Fellowship from the College of Engineering and Technology.

Entomology

Nor Aliza Abdul Rahim received the Myron H. Swenk Fund Travel Award from the Bruner Club Executive Committee.

Leela Alamalakala received the Milton E. Mohr Scholarship from the Center for Biotechnology, the Widaman Trust Distinguished Graduate Assistant Award from the Agricultural Research Division, First Place President's Prize for Ph.D. Student Poster Competition at the Entomological Society of America meetings, and the Myron H. Swenk Fund Travel Award from the Bruner Club Executive Committee.

Jon Bedick received First Place President's Prize for Ph.D. Student Poster Competition at the Entomological Society of America meetings, the Myron H. Swenk Fund Travel Award from the Bruner Club Executive Committee, and was a member of the Linnaean Team, which was Runner-up at the North Central Branch Entomological Society of America meetings.

Brian Clark received the Lady Bird Scholarship at the Midwest Institute for Biological Control Insect Pathology Workshop.

Peter Clark received the Myron H. Swenk Fund Travel Award from the Bruner Club Executive Committee.

Tom Clark received First Place in the Ph.D. Student Poster Competition at the North Central Branch Entomological Society of America meetings, the Myron H. Swenk Fund Travel Award from the Bruner Club Executive Committee, and was a member of the Linnaean Team which was Runner-up at the North Central Branch Entomological Society of America meetings.

Kevin Delaney received the Shear-Miles Fellowship Award from the Agricultural Research Division; the Myron H. Swenk Fund Travel Award from the Bruner Club Executive Committee; and was a member of the Linnaean Team, which was Runner-up at the North Central Branch Entomological Society of America meetings.

Tom Eickhoff received the Myron H. Swenk Fund Travel Award from the Bruner Club Executive Committee.

Tiffany Heng-Moss received the Watson Fellowship from the Golf Course Superintendent's Association of America, the Outstanding Graduate Student Award from the Nebraska Chapter of Sigma Xi and Graduate Research Assistant Award from the Nebraska Alumni Association.

Paula Macedo received First Place in the M.S. Student Oral Competition at the North Central Branch Entomological Society of America meetings and the Myron H. Swenk Fund Travel Award from the Bruner Club Executive Committee.

Tulio Macedo received the Myron H. Swenk Fund Travel Award from the Bruner Club Executive Committee.

Rodney Madsen received the Myron H. Swenk Fund Travel Award from the Bruner Club Executive Committee.

Federico Ocampo received the Graduate Teaching Assistant Award from the Nebraska Alumni Association and the Myron H. Swenk Fund Travel Award from the Bruner Club Executive Committee.

Isaac Oyediran received an Entomology Graduate Student Training Program Internship from Dow AgroSciences and the Myron H. Swenk Fund Travel Award from the Bruner Club Executive Committee.

Srinivas Parimi received Second Place in the Ph.D. Student Poster Competition at the North Central Branch Entomological Society of America meetings.

Aura Paucar received the Myron H. Swenk Fund Travel Award from the Bruner Club Executive Committee and the Travel Grant Award from the Ecology and Evolutionary Biology Initiative.

Connie Reimers-Hild received the Myron H. Swenk Fund Travel Award from the Bruner Club Executive Committee.

Lilian Saldanha received the Myron H. Swenk Fund Travel Award from the Bruner Club Executive Committee.

Raj Kumar Saran received the Jeffrey P. LaFage Graduate Student Research Award from the Entomological Society of America and the Ward A. and Helen W. Combs Scholarship from the Presto-X Company.

Andrew Smith received the Widaman Trust Distinguished Graduate Assistant Award from the Agricultural Research Division; the Warren F. and Edith R. Day Student Aid Fund Scholarship from the Dean of Graduate Studies; the Travel Grant Award from the Ecology and Evolutionary Biology Initiative, and the Myron H. Swenk Fund Travel Award from the Bruner Club Executive Committee.

Jenny Stebbing received the Widaman Trust Distinguished Graduate Assistant Award from the Agricultural Research Division and the Myron H. Swenk Fund Travel Award from the Bruner Club Executive Committee.

John Thomas received Second Place in the M.S. Student Poster Competition at the North Central Branch Entomological Society of America meetings.

Hasan Tunaz received the Myron H. Swenk Fund Travel Award from the Bruner Club Executive Committee and was a member of the Linnaean Team, which was Runner-up at the North Central Branch Entomological Society of America meetings.

Karla Villatoro received the Travel Grant Award from the Ecology and Evolutionary Biology Initiative and the Myron H. Swenk Fund Travel Award from the Bruner Club Executive Committee.

Amelia Zoerb received Second Place in the M.S. Student Oral Competition at the North Central Branch Entomological Society of America meetings and the Myron H. Swenk Fund Travel Award from the Bruner Club Executive Committee.

School of Natural Resource Sciences

Alex Moreno-Sotomayor received the Widaman Trust Distinguished Graduate Assistant Award from the Agricultural Research Division.

Veterinary and Biomedical Sciences

Aruna Ambagala received the Bukey Memorial Fellowship in recognition of scholastic performance and accomplishments as a student scholar from the University of Nebraska-Lincoln Graduate Fellowship Committee, Office of the Dean of Graduate Studies; the Milton E. Mohr Fellowship from the Center for Biotechnology; and an award for Best Poster Presentation from the Conference of Research Workers in Animal Diseases.

Marilyn J. Buhman received the Widaman Trust Distinguished Graduate Assistant Award from the Agricultural Research Division.

Shar H. El-Etr received the Widaman Trust Distinguished Graduate Assistant Award from the Agricultural Research Division.

Zhengyu Feng received the Major Fellowship Award from the Office of the Dean of Graduate Studies.

Melissa A. Inman received the Milton E. Mohr Fellowship from the Center for Biotechnology and the Susan Ann Smith Mills Award provided by endowment funds through the University of Nebraska Foundation by Ms. Elizabeth Wilson.

Gary Stevens received the Best Seminar Award from the Department of Veterinary and Biomedical Sciences.

Spring Younts received the Student Assistantship in Research and Scholarship (STARS) Award, summer funding for student research from the Office of the Dean of Graduate Studies.

Douglas S. Zatechka Jr., received the Best Seminar Award from the Department of Veterinary and Biomedical Sciences and the Excellence Award in a demonstrated presentation at the Midwest Student Biomedical Research Forum from Pfizer Animal Health, Inc.

Family and Consumer Sciences

Matthew Barkdull received the Bill McAdams Scholarship sponsored by the Hemophilia Foundation of Michigan and the National Kidney Foundation Scholarship from the Utah National Kidney Foundation.

Wenli Liu received the Human Rights and Human Diversity Fellowship from the University of Nebraska-Lincoln.

Wenli Liu received the Founders Fellowship from Phi Upsilon Omicron.

Lois Mberengwa received the Outstanding Dissertation Research Award from the American Association for Family and Consumer Sciences.

Ayana Reed received the Minority Fellowship Award from the American Association for Marriage and Family Therapy sponsored by the AAMFT Research and Education Foundation and the AAMFT Awards Committee.

Rose Suggett received the Student/New Professional Award from the National Council of Family Relations.

Nutritional Science and Dietetics

Ji-Young Lee received the Widaman Trust Distinguished Graduate Assistant Award from the Agricultural Research Division.

Jun Ma received a major fellowship from the UNL Graduate Fellowship Committee.

Ahmad Sulaeman was selected to compete for the Institute of Food Technologists' International Division Graduate Student Award.

Northeast Research and Extension Center

Sean Evans received the J. Fielding Reed Memorial Fellowship from Potash and Phosphate Institute; the Henry M. Beachell Fellowship from the University of Nebraska; the Li-Cor travel grant from Li-Cor, Inc.; and the IANR Issues Symposium Outstanding Poster from the Institute of Agriculture and Natural Resources.

South Central Research and Extension Center

Aaron Waltz received a Henry B. Beachell Fellowship from the University of Nebraska and a first place in his section of the North Central Weed Science Society poster contest.

Adam Johnson received second place in his section of the North Central Weed Science Society poster contest.

Undergraduate Honors Student Research Program

The purpose of this new program is to allow outstanding University Honors Program students to conduct research under the direction of a faculty mentor. The program is open to junior and senior Honors Program participants proposing to work with a faculty member who has an ARD appointment. A subcommittee of the ARD Advisory Council selects awardees based on the quality of the proposal. Proposals are authored by the students with guidance from the proposed project mentors.

Agricultural Economics

Jessica Harrison received an Honors Award for "An Analysis of Incentives and Barriers Facing CASNR Students Contemplating the Return to the Family Farm" from the Agricultural Research Division. (J. Allen, Advisor)

Mark Hassebrook received an Honors Award for "Evaluating the Effectiveness and Methodologies of Agricultural Interest Groups in the Nebraska Legislature" from the Agricultural Research Division. (G. Pfeiffer, J. Comer, J. Schinstock, Advisors)

Catherine Kalinowski received an Honors Award for "An Ex-Post Economic Analysis of Material Recovery Programs Sponsored by the Nebraska Environmental Trust" from the Agricultural Research Division. (B. Johnson, Advisor)

Melissa Van Winkle received an Honors Award for "An Analysis of Nebraska's Rural Development" from the Agricultural Research Division. (R. Perrin, Advisor)

Agricultural Leadership, Education and Communication

Caleb J. Harms received an Honors Award for "Differing Perspectives on the Future of Rural Education in Nebraska" from the Agricultural Research Division. (S. Fritz, Advisor)

Animal Science

Jamie W. Poskochil received an Honors Award for "Fine Mapping of *jrc* Cataract Mutation in Mice" from the Agricultural Research Division. (M. Nielsen, Advisor)

Biochemistry

Erick Kinyungu received an Honors Award for "Molecular Basis of Rubisco Transcription" from the Agricultural Research Division. (R. Spreitzer, Advisor)

Brett Meyer received an Honors Award for "CLA, Body Fat, and Apoptosis" from the Agricultural Research Division. (R. Klucas and J.L. Miner, Advisors)

Amy Miller received an Honors Award for "An Attempt to Isolate an Acetamidase cDNA from *Chlamydomonas reinhardtii*" from the Agricultural Research Division. (D. Weeks, Advisor)

Troy Munson received an Honors Award for "Biochemical Studies of Human Methionine Synthase Reductase" from the Agricultural Research Division. (R. Banerjee, Advisor)

Dana Novak received an Honors Award for "Localization Studies on a Soybean Acid Phosphatase in Yeast" from the Agricultural Research Division. (G. Sarath, Advisor)

Biological Systems Engineering

Jeffrey E. Nicolaisen received an Honors Award for "Phosphorus and Nitrogen in Runoff as Affected by Crop Residue" from the Agricultural Research Division. (J. Gilley, Advisor)

Entomology

Paul Nabity received an Honors Award for "*Calliphoridae* Larval Development Responses to Temperature Variances" from the Agricultural Research Division. (L. Higley, Advisor)

Plant Pathology

Chad Zimmerman received an Honors Award for "Chemical Phophylaxis for Control of GrayLeaf Spot on Corn" from the Agricultural Research Division. (J. Partridge, Advisor)

Veterinary and Biomedical Sciences

Nathan Erdmann received an Honors Award for "Identification and Manipulation of *Legionella pneumonhila* Genes Actively Involved in Entry" from the Agricultural Research Division. (J. Cirillo, Advisor)

Leah Lemale received an Honors Award for "Significance of Antibodies in Protecting Against Porcine Reproductive and Respiratory Syndrome Virus (PRRSV) Infections" from the Agricultural Research Division. (F. Osorio, Advisor)

Water Center

Brian Dietz received an Honors Award for "Effects of Avian and Wandering Spider Predation on Grasshopper Populations in an Eastern Nebraska Grassland" from the Agricultural Research Division. (A. Joern, Advisor)

Variety and Germplasm Releases

ARD faculty involved in plant breeding and genetics research make important contributions to the improvement and development of agricultural and horticultural crops.

Public breeding programs such as ARD's are essential to the continued enhancement of plant germplasm. These programs provide the resources and flexibility to pursue long-term breeding programs in crops that may not have a current commercial interest. They also can address genetic, cultural and management interactions characteristic of today's agriculture, as well as the future's.

Germplasm releases provide improved genetic material that is integrated into private and public plant breeding programs. Other releases occur as new cultivars (varieties), which are increased through the Foundation Seed Division and then provided to seed companies for production of certified seed. The following releases were made in 2000.

Agronomy/Horticulture

Crop: Grain Sorghum [*Sorghum bicolor* (L.) Moench]

Germplasm Release: 44 Pairs of Grain Sorghum Seed parent (A-Line) and their Respective Maintainers (B-Lines) (N341 A+B to N384 A+B)

Scientists: D.J. Andrews and J.F. Rajewski

Characteristics: These seed parents are in the medium to full season maturity class for SE Nebraska and similar environments which are male sterile in the A_1 cms system (milo cytoplasm). The germplasms were developed in the program to introgress tropically adapted food quality grain sorghums into sorghum seed parents adapted to the U.S. high plains. These lines resulted from emasculation crosses made from 1988 to 1992. Generally pedigree selection was followed from F_2 to F_6 at ARDC Mead experimental farm including 3-4 generation advances in winter nurseries. Where test crosses included completely male sterile plants, 4-6 generations of plant to plant backcrosses were made concurrently while selecting only within those B-lines that continued to perfectly maintain male sterility. All A lines have consistently shown good male sterility over years. Days to bloom average from 70 to 84 days. In general, these seed parents are average to short in height and medium early to medium late in maturity. All but 4 have white or pale yellow grain and 16 have tan plant color. Pest and disease reactions of these lines have not been determined. Because of their parentage these seed parent germplasms contribute new genetic diversity for sorghum hybrid development.

Crop: Grain Sorghum [*Sorghum bicolor* (L.) Moench]

Germplasm Release: 49 Grain Sorghum Male Fertility Restorer Germplasms (R Lines) (N385R - N433R)

Scientists: D.J. Andrews and J.F. Rajewski

Characteristics: These germplasms restore male fertility in hybrids made with A_1 cms (milo cytoplasm) seed parents. The restorer lines were developed to introgress grain sorghum food quality germplasm from tropical breeding programs into parental lines adapted to the high plains region of the USA. Emasculation crosses were made between 1987 and 1994 and pedigree selection continued from F_2 to between F_7 and F_{12} at the ARDC experimental farm at Mead, NE, and in winter nurseries in Mexico. These germplasms are average to short in height and medium early to medium late in maturity. Days to bloom range from 66 to 88 days. All but 4 have white or pale yellow grain and 16 have tan plant color. Pest and disease reactions of these lines have not been determined. Because of their parentage and ability to make good male fertile hybrids, these restorer germplasms offer new genetic diversity for the development of new hybrids.

Crop: Grain Sorghum [*Sorghum bicolor* (L.) Moench]

Germplasm Release: 27 Grain Sorghum Maintainer (B-Line) (N433B - N457B) or Restorer (R Line) Germplasms (N458R - N460R)

Scientists: D.J. Andrews, J.F. Rajewski, and P.J. Bramel-Cox

Released by: University of Nebraska Agricultural Research Division and the Kansas State University Sorghum Research Program

Characteristics: These grain sorghum germplasms will either completely maintain male sterility (B lines) or will restore male fertility (R lines) in the A_1 cms system (milo cytoplasm). These germplasms were selected in Nebraska from segregating S_3 and S_4 families provided by the Kansas State program to the UNL program in 1996. Days to bloom range from 65 to 97 days, and plant height ranges from 82 cm to 130 cm. Sixteen germplasms have tan plant color, and grain color in all but two are strong white to yellow endosperm. The pest and disease reactions of these germplasms have not been determined. Because of their unique parentage, these germplasms contribute new genetic diversity for the development on new hybrids.

Crop: Grain Sorghum [*Sorghum bicolor* (L.) Moench]

Germplasm Release: 28 Grain Sorghum F_4 to F_6 Germplasm Families (N461-N488)

Scientists: D.J. Andrews and J.F. Rajewski

Characteristics: These families are in the medium to full season maturity class for southeast Nebraska and similar environments. They were developed to introgress tropically adapted food quality grain sorghums into sorghum seed parents adapted to the U.S. high plains. These germplasms resulted from emasculation crosses made from 1992 to 1995 between introductions from tropical sorghum breeding programs and UNL lines. Pedigree selection was followed with emphasis on white or yellow endosperm grain, and tan plant color. The germplasms are generally short to medium height and medium to full season in maturity in Eastern Nebraska. Many have white or yellow endosperm grain, and tan plant color. Pest and disease reactions of these germplasms have not been determined. Because of their parentage these germplasm families provide new genetic diversity for the selection of new parental lines for hybrid development.

Crop: Grain Sorghum [*Sorghum bicolor* (L.) Moench]

Germplasm Release: 15 Early Maturing Grain Sorghum Maintainer Parent (B-Line) Germplasms (N489B - N503B) and Partially Backcrossed Seed Parents (A-Lines)

Scientists: D.J. Andrews, J.F. Rajewski, D. Baltensperger, and G. Frickel

Characteristics: These B line germplasms were developed in the program conducted at the High Plains Agricultural Laboratory, Sidney, NE, to produce early maturing seed parents for western Nebraska. Generally pedigree selection from F_2 to F_5 or F_6 was conducted at Sidney with alternate generations in the winter nurseries in Mexico. In general, these lines are average to short in height and early in maturity. Days to bloom range from 66 to 81 days. All but 2 have tan plant color, and all but 3 have light red colored grain. Pest and disease reactions of these lines have not been determined. Because of their parentage these seed parents contribute new genetic diversity for the development of very early maturing hybrids. The tan plant red grain lines will permit the development of attractive bronze grain hybrids.

Crop: Grain Sorghum [*Sorghum bicolor* (L.) Moench]

Germplasm Release: 48 Early Maturing Grain Sorghum Male Fertility Restorer Germplasms (R-Lines) N504R - N551R)

Scientists: D.J. Andrews, J.F. Rajewski, D. Baltensperger, and G. Frickel

Characteristics: These early maturing grain sorghum R-lines germplasms restore male fertility in the A_1 cms system (milo cytoplasm). The lines were developed in the program conducted at the High Plains Agricultural Laboratory, Sidney, Nebraska, to produce early maturing hybrid parents for western Nebraska. They resulted from emasculation crosses made in 1992 to 1994 between early maturing restorer lines under development and some tropical food quality introductions. In general, these germplasms are average to short in height, and early to bloom. Days to bloom range from 56 to 84 days. Grain color of all but 3 pale red grain germplasms is white or pale yellow endosperm. Twenty-nine germplasms have tan plant color, and 19 purple. Pest and disease reactions of these lines have not been determined. These restorer germplasms offer new genetic diversity for the development of very early maturing hybrids.

Crop: Grain Sorghum [*Sorghum bicolor* (L.) Moench]

Germplasm Release: 7 Late Maturing Grain Sorghum Seed Parent (A-B Lines) (N552 A+B - N558 A+B) and 20 Tall Restorer (R Line) Germplasms (N559R - N579R)

Scientists: D.J. Andrews and J.F. Rajewski

Characteristics: The grain sorghum seed parents provide new genetic diversity for late grain hybrids, or for forage hybrids. The restorer parents provide new diversity for forage hybrids. Days to bloom range from 74 to 99 days. All but five have tan plant color and all but 2 have food quality grain, white or pale yellow in color. Most are late to very late in maturity in respect to southeast Nebraska conditions. The pest and disease reactions of these germplasms have not been determined.

Crop: Hard Red Winter Wheat (*Triticum aestivum* L.)

Variety Name: Millennium

Scientists: P.S. Baenziger, B. Moreno-Sevilla, C.J. Peterson, D.R. Shelton, R.W. Elmore, P.T. Nordquist, R.N. Klein, D.D. Baltensperger, L.A. Nelson, D.V. McVey, J.E. Watkins, and J.H. Hatchett

Released By: University of Nebraska Agricultural Experiment Station, the South Dakota Agricultural Experiment Station, South Dakota State University, and the United States Department of Agriculture Agricultural Research Service

Characteristics: 'Millennium' was released primarily for its superior adaptation to dryland wheat production systems in Nebraska (except southeastern Nebraska) and similar growing areas in South Dakota and adjacent states. Millennium is an awned, white-glumed cultivar. Its field appearance is most similar to 'Arapahoe'. After heading, the canopy is moderately open and upright. The flag leaf is erect and twisted at the boot stage. The foliage is green with waxy bloom at anthesis. The leaves are glabrous. The spike is tapering in shape, long, and middense. The glume is short to midlong and midwide, and the glume shoulder is square to rounded. The beak is medium in length with an acuminate tip. The spike is usually nodding at maturity. Kernels are red colored, hard textured, midlong, and elliptical in shape. The kernel has no collar, a midsize brush of medium length, rounded cheeks, midsize germ, and a narrow and shallow crease. The main advantage Millennium has when compared to most other available wheat cultivars, within its area of adaptation, is its high grain yield, ability to yield well under favorable production conditions, and broad adaptation in dryland production systems. It is medium in maturity and has a shorter length coleoptile. It has good strong straw strength, and good to very good winter-hardiness similar to Abilene and comparable to other winter wheat cultivars adapted and commonly grown in Nebraska. Millennium is moderately resistant to stem rust, leaf rust, and Hessian fly (*Mayetiola destructor* Say), and susceptible to wheat soilborne mosaic virus, and barley yellow dwarf virus. The overall end-use quality characteristics for Millenium should be acceptable to the milling and baking industries.

Crop: Hard Red Winter Wheat (*Triticum aestivum* L.)

Variety Name: Cougar

Scientists: P.S. Baenziger, B. Moreno-Sevilla, C.J. Peterson, D.R. Shelton, R.W. Elmore, P.T. Nordquist, R.N. Klein, D.D. Baltensperger, L.A. Nelson, D.V. McVey, J.E. Watkins, J.H. Hatchett, and R. Graybosch

Released By: University of Nebraska Agricultural Experiment Station, and the United States Department of Agriculture Agricultural Research Service

Characteristics: 'Cougar' was released primarily for its having very long coleoptile (similar to Scout 66) with exceptional straw strength (superior to 2137 and Wesley). Similar to Thunderbird its yield level is lower except where its coleoptile length and standability are needed. It has excellent test weight and kernel size. Cougar is an awned, white-glumed cultivar. Its field appearance is most similar to 'Thunderbird' and 'Big Dawg'. After heading, the canopy is open and upright. The flag leaf is erect and twisted at the boot stage. The foliage is green with a slight blue cast and a waxy bloom at anthesis. The leaves are glabrous. The spike is tapering in shape, moderately long to long, and middense. The glume is short and wide, and the glume shoulder is square. The beak is moderately short in length with an acuminate tip. The spike is usually erect to inclined at maturity. Kernels are red colored, hard textured, midlong, and elliptical to ovate in shape. The kernel has no collar, a midsize

large brush of medium length, rounded cheeks, midsize germ, and a midwide and shallow crease. The main advantage Cougar has when compared to most other available wheat cultivars, within its area of adaptation, is its long coleoptile, exceptional straw strength, good grain volume weight and kernel size, and comparative grain yields. Cougar is moderately resistant to stem rust, moderately susceptible to leaf rust, and susceptible to wheat soilborne mosaic virus, Hessian fly (*Mayetiola destructor* Say), barley yellow dwarf virus, and wheat streak mosaic virus. The overall end-use quality characteristics for Cougar should be acceptable to the milling and baking industries.

Crop: Hard White Winter Wheat (Triticum aestivum L.)

Variety Name: Nuplains

Scientists: C.J. Peterson, R.A. Graybosch, D.R. Shelton, D.D. Baltensperger, P.S. Baenziger, L.A. Nelson, D.V. McVey, J.E. Watkins, and J. Krall

Released By: United States Department of Agriculture Agricultural Research Service, the University of Nebraska Agricultural Experiment Station, the South Dakota State University Agricultural Experiment Station, and the University of Wyoming Agricultural Experiment Station

Characteristics: 'Nuplains' was released for its breadmaking quality and white grain color combined with adaptation, grain yield potential, and disease resistance for production in the north central Great Plains. Nuplains appears to be best suited for dryland production areas in south central and southwest Nebraska and to similar areas in adjacent states. It also has shown promise for use in irrigated production systems in southwest and western Nebraska. Nuplains is an awned, white-glumed, semi-dwarf cultivar with straw strength superior to 'Arapahoe'. Plant height of Nuplains has averaged 3 cm shorter than '2137' and 10 cm shorter than Arapahoe. It has a short coleoptile. Winterhardiness is adequate for Nebraska growing conditions. It is a medium maturing cultivar under Nebraska conditions, with heading date averaging 2 to 3 days earlier than Arapahoe. Nuplains has exhibited adult-plant and seedling resistance to stem rust. It is moderately susceptible to current races of leaf rust, and is susceptible to soil-borne mosaic virus, wheat streak mosaic virus, the Great Plains biotype of Hessian fly (*Mayetiola destructor* Say), and the Russian wheat aphid (*Diuraphia noxia* Mordvilko). Nuplains has mellow dough mixing properties with acceptable mixing tolerance. It was found to have acceptable end-use quality for commercial bread applications. Nuplains was evaluated for use in Asian noodle products by the Wheat Marketing Center, Portland, OR. In Taiwanese raw and Hokkien style noodle evaluations, Nuplains has received acceptable ratings for dough handling, machining properties, and noodle texture. Noodle color ratings varied, but were generally considered as less than desirable due to discoloration after 24 hours of storage. Grain samples were provided to the USDA-GIPSA for classification purposes. Grain color of Nuplains was considered as acceptable for the hard white wheat class.

Animal Science

Swine Release

Germplasm Release: NE Index Line

Scientist: Rodger Johnson

Released by: University of Nebraska Animal Science Department, Nebraska Agricultural Research Division, and University of Nebraska Office of Research Grants and Services.

Characteristics: The Nebraska Index Line is a novel line with superior reproduction that was developed during a 20-year selection experiment. Traits selected for include ovulation rate, uterine capacity and litter size. Crosses of the NE line with other commercially available lines have had 35% greater production per breeding female than other commercially available lines.

Plant Pathology

Crop: Dry Bean (*Phaseolus vulgaris* L.)

Variety: 'Anacaona' White Bean

Scientists: J.C. Nin, E. Arnaud-Santana, F. Saladin, G. Godoy-Lutz, D.P. Coyne, J.S. Beaver, and J.R. Steadman

Released By: Centro de Investigacion Agricola del Suroeste, Ministry of Agriculture, Dominican Republic in cooperation with the University of Nebraska and the University of Puerto Rico

Characteristics: Anacaona has resistance to isolates of AG-1-1B and AG-2-2 of the web blight pathogen and to prevailing strains of *Xanthomonas campestris* pv. *phaseoli* in the DR and Puerto Rico. It was resistant to 10 Dominican pathotypes of rust in a greenhouse inoculation test. Anacaona is susceptible to bean golden mosaic virus. It has an indeterminate growth habit (Type II) with a short vine (75 cm). Physiological maturity is reached at about 70 d after planting. The small white seeds are elliptically shaped and range in size from 18-20 g 100^{-1} seeds. It is well adapted to low and intermediate altitudes with mean yields ranging from 2500-2800 kg ha^{-1}. It exceeded the yield of the standard Arroya Loro at five locations (1989-1993).

Crop: Dry Bean (*Phaseolus vulgaris* L.)

Variety: 'Arroyo Loro Negro' black bean

Scientists: E. Arnaud-Santana, J.C. Nin, F. Saladin, G. Godoy-Lutz, D.P. Coyne, J.S. Beaver and J.R. Steadman

Released By: Centro de Investigacion Agricolas del Suroeste, Ministry of Agriculture, Dominican Republic in cooperation with the University of Nebraska and the University of Puerto Rico

Characteristics: Arroyo Loro Negro is well adapted to a wide range of altitudes (100 to 1500 m) with mean yields ranging from 1046 to 1825 kg ha^{-1} (1993-1997) exceeding the yield of ICTA- JU-90-7 (822-1200 kg ha^{-1}) over three locations in the DR (1993-1996). Arroyo Loro Negro produced a mean yield of 1702 kg ha^{-1} in regional field trials conducted in the DR, Panama, Puerto Rico, and Cuba (1993-1994). Arroyo Loro Negro is more tolerant to drought, high temperature, and low soil fertility than traditional black cultivars such as 'Venezuela 44'. Arroyo Loro Negro has an indeterminate, short vine Type II growth habit and reaches physiological maturity about 70 d after planting. The seed is opaque black, elliptically shaped, and ranges in size from 19 to 21 g 100^{-1} seeds. It has resistance to the web blight, rust, and common blight pathogens while bean golden mosaic causes a susceptible reaction.

Crop: Dry Bean (*Phaseolus vulgaris* L.)

Variety: 'CIAS-95' red mottled bean

Scientists: E. Arnaud-Santana, J.C. Nin, F. Saladin, G. Godoy-Lutz, D.P. Coyne, J.S. Beaver and J.R. Steadman

Released By: Centro de Investigacion Agricola del Suroeste, Ministry of Agriculture, Dominican Republic in cooperation with the University of Nebraska and the University of Puerto Rico

Characteristics: CIAS-95 possesses field resistance to strains of *Xanthomonas campestris* pv. *phaseoli* and rust pathotypes present in the resistance to five out of nine DR rust pathotypes. It is susceptible to bean golden mosaic virus, resistance to bean common mosaic virus NY-15, but susceptible to bean common mosaic necrotic virus-NL3 strain. CIAS-95 has a Type I determinant bush growth habit and flowers early (30-33 d). Physiological maturity is reached about 75-80 d after planting. Seeds are dark red mottled, elliptically shaped and medium sized (40-45 g 100^{-1} seeds). The number of pods per plant is between 10 and 15 with about 3-4 seeds per pod. The mean yields of CIAS-95 ranged from 1167 to 2000 kg ha^{-1} (1993-1995), and exceeded the yield of the standard PC-50 in four out of six locations.

Crop: Dry Bean (*Phaseolus vulgaris* L.)

Variety: 'Saladin-97' red mottled bean

Scientists: J.C. Nin, E. Arnaud-Santana, F. Saladin, G. Godoy-Lutz, D.P. Coyne, J.S. Beaver, and J.R. Steadman

Released By: Centro de Investigacion Agricola del Suroeste, Ministry of Agriculture, Dominican Republic in cooperation with the University of Nebraska and the University of Puerto Rico

Characteristics: Saladin-97 has field resistance to strains of the common blight pathogen. It is susceptible to Type II of the bean golden mosaic virus, resistant to bean common mosaic virus NY-15 strain, and susceptible to bean common mosaic necrotic virus-NL3 strain. Saladin-97 exhibited partial resistance to rust in the field, but was resistant to only 3 out of 10 DR rust pathotypes in a greenhouse inoculation test. Yields ranged from 1309 to 2073 kg ha^{-1}, and exceeded the standard cultivar PC-50 in five out of six locations in the DR (1993-1995). Saladin-97 has a determinant type I growth habit and matures in about 60

d after planting. The seeds are light red mottled, elliptically shaped, and medium sized (42-44 g 100^{-1} seeds). The number of pods per plant is between 13 and 15 with 3-4 seeds per pod.

Crop: Dry Bean (*Phaseolus vulgaris* L.)

Variety: 'JB-178' red mottled bean

Scientists: E. Arnaud-Santana, J.C. Nin, F. Saladin, G. Godoy-Lutz, J.S. Beaver, D.P. Coyne and J.R. Steadman

Released By: Centro de Investigacion Agricola del Suroeste, Ministry of Agriculture, Dominican Republic, in cooperation with the University of Puerto Rico and the University of Nebraska

Characteristics: JB-178 has partial resistance (smaller and fewer uredinia) to rust in the field in the DR but was susceptible to eight out of nine DR rust pathotypes in a greenhouse test. It is susceptible to bean golden mosaic virus, resistant to bean common mosaic virus NY-15 strain, and susceptible to bean common mosaic necrotic virus-NL3 strain. JB-178 is well adapted to low and intermediate altitudes (100 to 1000 m). Seed yields of JB-178 ranged from 1091 to 2131 kg ha^{-1} and was similar to 'PC-50' in trials in the DR (1993-1995). JB-178 has a determinant (Type I) growth habit generally reaching a height of at least 50 cm. It reaches physiological maturity from 55 to 60 d after planting. Seeds are light red mottled, elliptically shaped and range from 46-47 g 100^{-1} seeds.

Crop: Dry Bean (*Phaseolus vulgaris* L.)

Variety: 'PC-50' red mottled bean

Scientists: F. Saladin, E. Arnaud-Santana, J.C. Nin, G. Godoy-Lutz, J.S. Beaver, D.P. Coyne, and J.R. Steadman

Released By: Centro de Investigacion Agricola del Suroeste, Ministry of Agriculture, Dominican Republic in cooperation with the University of Nebraska and the University of Puerto Rico

Characteristics: PC-50 has a Type I determinate growth habit and reaches physiological maturity 55-60 d after planting. The seed is medium sized (40-42 g 100^{-1} seeds), elliptically shaped and red mottled. Cooking quality was regarded as excellent by local people following use of their traditional pot cooking methods. PC-50 is well adapted to low to intermediate altitudes (100-1500 m). PC-50 possesses the Ur-4 and Ur-9 genes for resistance to rust. It shows partial resistance to the DR rust pathotypes, but was susceptible to 6 out of 10 rust pathotypes in greenhouse tests. PC-50 is susceptible to Type II bean golden mosaic, common bacterial blight, to isolates of AG-1-1B and AG-2-2 of the web blight pathogen, and to bean common mosaic.

Crop: Dry Bean (*Phaseolus vulgaris* L.)

Variety: Weihing

Scientists: D.P. Coyne, D.S. Nuland, D.T. Lindgren, J.R. Steadman, D.W. Smith, J. Gonzales, J. Schild, J. Reiser, L. Sutton, C. Carlson, J.R. Stavely and P. Miklas

Released By: University of Nebraska Agricultural Experiment Station and United States Department of Agriculture, Agricultural Research Service

Characteristics: Great northern 'Weihing' was released for its resistance to prevalent races of the rust pathogen and strains of the common blight and halo blight pathogens in Nebraska combined with moderate avoidance to white mold because of an upright and open plant canopy. Seed can be produced in Idaho because of bean common mosaic resistance. The multiple disease resistance lowers production costs and the upright plant habit facilitates furrow irrigation and cultivation. Weihing has large white seeds, and yields were similar to standard great northern cultivars Harris and Beryl.

Copyrights and Patents

Copyright and patent protection is an important parameter in research. It is especially important for discoveries and innovations that have a potential commercial application. Therefore, from time to time, the ARD (and the University) may determine that the public good is best served with regard to technology transfer by entering into an agreement with a public or private institution that provides the institution with proprietary interests in specific research. The research of ARD scientists often can lead to a patent. Most of the patents that have been awarded to ARD scientists have been for equipment developments and specialized processes. These patents often are licensed by private industry, with royalties being reinvested in future ARD research. The following copyright and patents were awarded in 2000.

Veterinary and Biomedical Sciences

Patent Title	Identification of Novel Loci Involved in Entry by *Legionella pneumophila*
Patent Number	U.S. Patent Application, serial number: 09/628,871
Scientists	J.D. Cirillo
Description	We have developed a novel strategy for the identification of genes involved in the ability to cause disease from nearly any bacterial pathogen of animals and humans. This approach will allow the development of novel methods for the prevention and treatment of infections.

Patent Title	Nucleotide Sequences and Method for Detection of *Serpulina hyodysenteriae*
Patent Numbers	American Type Culture Collection Deposit No. 75826; United States Patents 5,698,394; 5,869,630 and 6,068,843
Scientists	G.E. Duhamel and R.O. Elder
Description	This invention provides an improved method for detecting the presence of *Serpulina hyodysenteriae* in a biological sample, an oligonucleotide primer and an S. hyodysenteriae specific oligonucleotide probe useful in that method, as well as an article of manufacture that contains the primers and/ or probe. In addition, this invention provides a 2.3 kb DNA fragment derived from genomic DNA of S. hyodysenteriae and encoding for a 56 kDa polypeptide, a recombinant expression vector containing the DNA fragment, the 56 kDa polypeptide and a monoclonal antibody reactive with the peptide, and a method of assaying for antibodies reactive with the 56 kDa peptide.

Administration

ARD is one of five divisions within the Institute of Agriculture and Natural Resources (IANR) at the University of Nebraska. IANR was established by the Nebraska legislature in 1973 and has its headquarters on the University of Nebraska-Lincoln East Campus. The University of Nebraska system has four campuses: University of Nebraska-Lincoln, University of Nebraska Medical Center, University of Nebraska at Omaha and the University of Nebraska at Kearney. The University of Nebraska system is governed by an elected Board of Regents and administered by a system and campus administration.

Administrative Personnel
(June 2001)

University of Nebraska Board of Regents

Don S. Blank, McCook
Randolph Ferlic, Omaha
Chuck Hassebrook, Walthill
Jay Matzke, Seward
Drew Miller, Papillion
Nancy O'Brien, Waterloo
Kent Schroeder, Kearney
Charles S. Wilson, Lincoln

Student Regents

UNMC — Javine Winterboer
UNO — Mallory Prucha
UNL — Nathan Fuerst
UNK — Ryan Samuelson

Administrative Officers

L. Dennis Smith, President, University of Nebraska

Harvey S. Perlman, Chancellor, University of Nebraska-Lincoln

John C. Owens, Harlan Vice Chancellor, Institute of Agriculture and Natural Resources, and Vice President, University of Nebraska

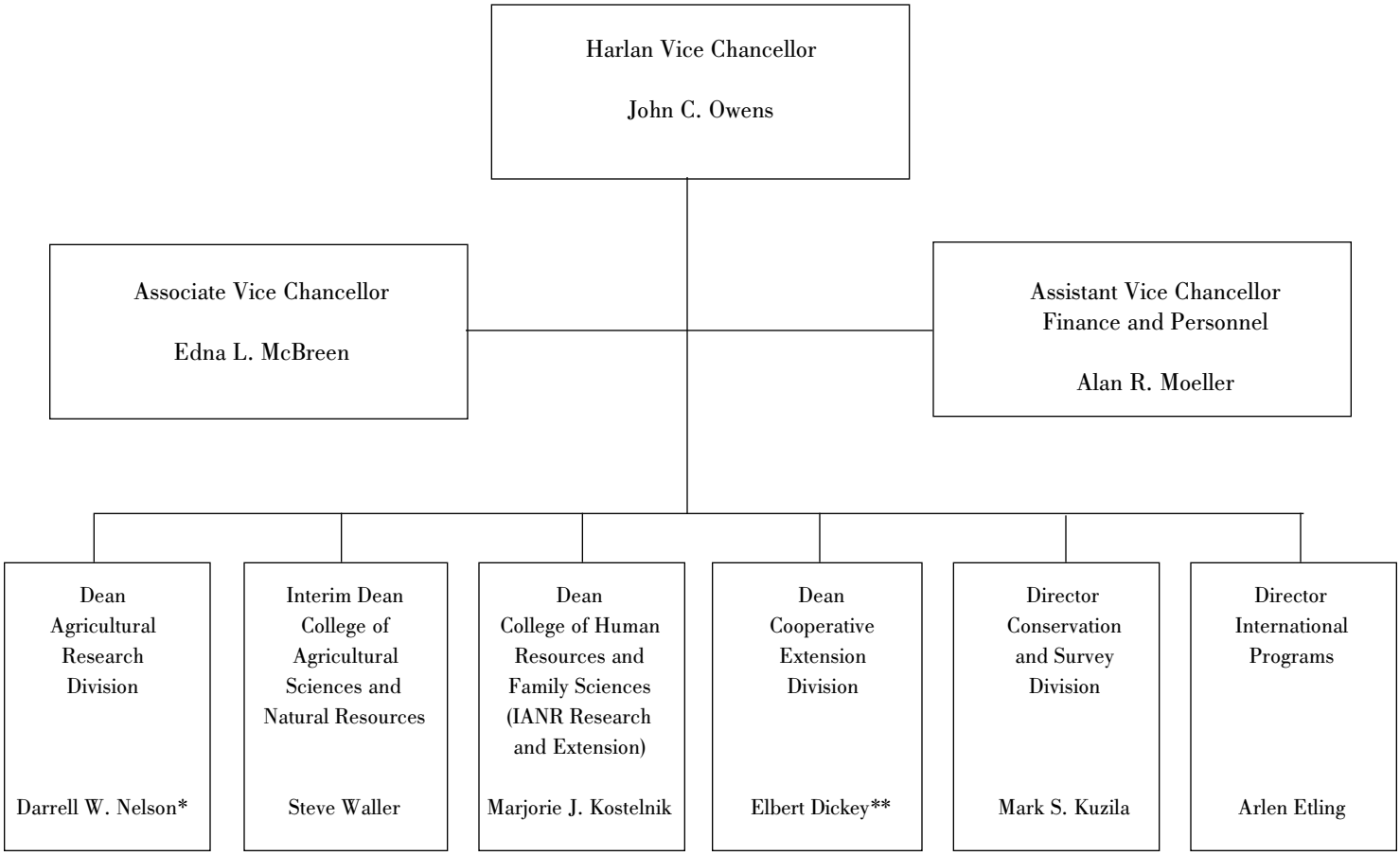
Agricultural Research Division

Darrell W. Nelson, Dean and Director
Dale H. Vanderholm, Associate Dean and Director
Marjorie J. Kostelnik, Human Resources and Family Sciences
Dora Dill, Administrative Technician
Nelvie Lienemann, Staff Assistant
Diane Mohrhoff, Project Assistant
Shirley McCain[1], Temporary/On Call

[1]Temporary appointment

Organizational Chart

Institute of Agriculture and Natural Resources
University of Nebraska-Lincoln
June 2001



*Director, Nebraska Agricultural Experiment Station
**Director, University of Nebraska Cooperative Extension

Administrative Units Reporting to Agricultural Research Division
Institute of Agriculture and Natural Resources
The University of Nebraska-Lincoln
June 2001

Agricultural/Natural Resources Units

Agricultural Economics
Jeffrey Royer, Head

Agricultural Leadership, Education and Communication
Earl Russell, Head[1]
Susan Fritz, Head[2]

Agronomy/Horticulture
Kenneth Cassman, Head

Animal Science
Donald Beermann, Head

Biochemistry
Robert Klucas, Head

Biological Systems Engineering
Glenn Hoffman, Head

Biometry
David Marx, Chair

Entomology
Z B Mayo, Head

Food Science and Technology
Steve Taylor, Head

Plant Pathology
Anne Vidaver, Head
Jim Steadman, Acting Head

School of Natural Resource Sciences
Ted Elliott, Director

Veterinary and Biomedical Sciences
Jack Schmitz, Head

Human Resources and Family Sciences Departments

Family and Consumer Sciences
Julie Johnson, Chair

Nutritional Science and Dietetics
Marilynn Schnepf, Chair

Textiles, Clothing and Design
Rita Kean, Chair
Pat Crews, Acting Chair[1]

Off-Campus Research Centers

Agricultural Research and Development Center
Ithaca—Daniel Duncan, Director

Northeast Research and Extension Center
Concord—John Witkowski, Director

Panhandle Research and Extension Center
Scottsbluff—Charles Hibberd, Director

South Central Research and Extension Center
Clay Center—Alan Baquet, Director

Southeast Research and Extension Center
Lincoln—Randy Cantrell, Director

West Central Research and Extension Center
North Platte—Gary Hergert, Director

Interdisciplinary Centers

Biotechnology Center
Anne Vidaver, Director[1]
Ruben Donis, Acting Director[2]

Food Processing Center
Steve Taylor, Director

Center for Grassland Studies
Martin Massengale, Director

Great Plains Regional Center for Global Environmental Change
Shashi Verma, Director

Industrial Agricultural Products Center
Milford Hanna, Director

Center for Rural Community Revitalization and Development
John Allen, Director

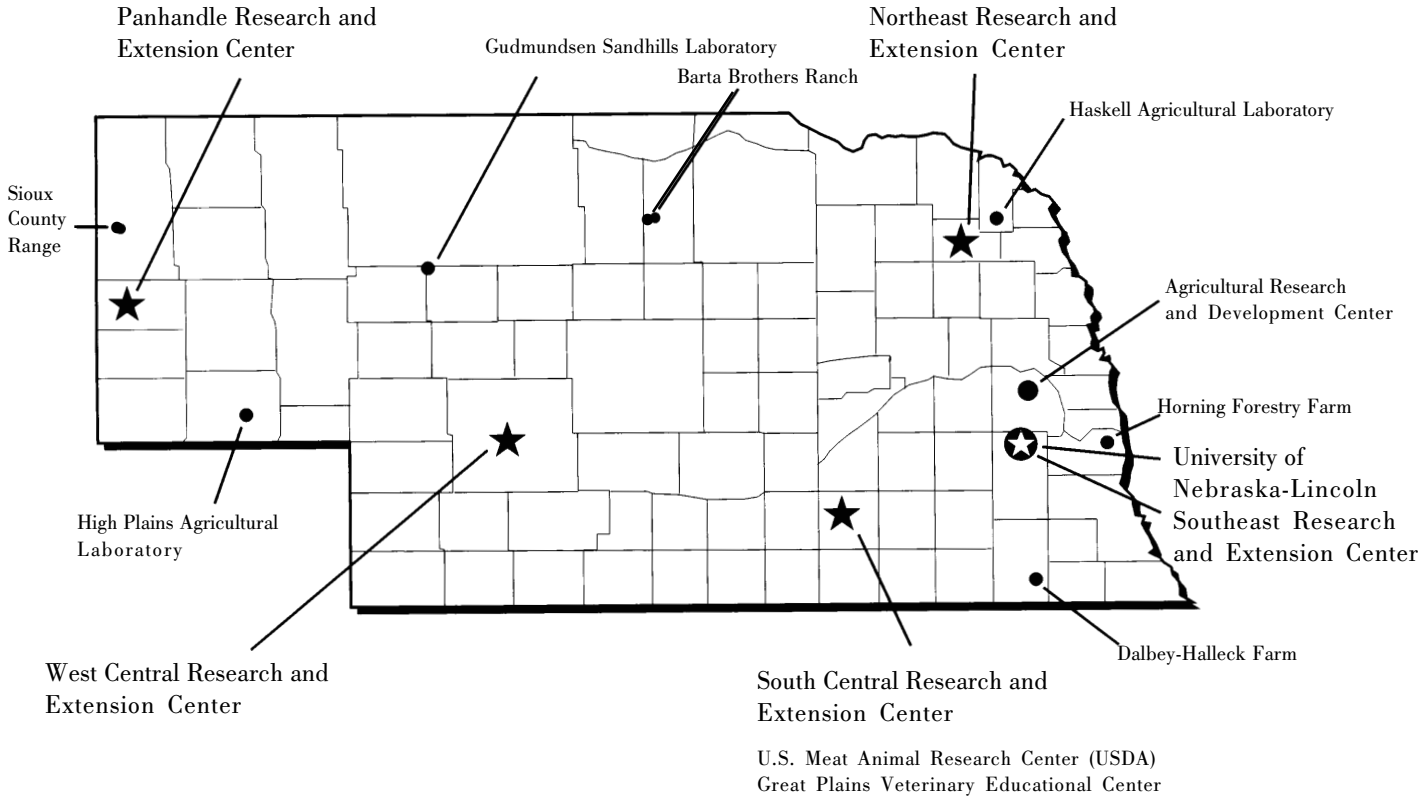
Center for Sustainable Agricultural Systems
Chuck Francis, Director[1]

Water Center/ Environmental Programs
Edward Vitzthum, Interim Director[1]
Kyle Hoagland, Director[2]

IANR Communications and Information Technology
Dan Cotton, Director

[1]Ended appointment during 2000-2001
[2]Began appointment during 2000-2001

IANR Research Facilities



Research by Agricultural Research Division researchers is conducted across the state. Sites include:

Agricultural Research and Development Center — Ithaca

Barta Brothers Ranch — Long Pine

Dalbey-Halleck Farm — Virginia

Gudmundsen Sandhills Laboratory — Whitman

Haskell Agricultural Laboratory — Concord

High Plains Agricultural Laboratory — Sidney

Horning Forestry Farm — Plattsmouth

Northeast Research and Extension Center — Norfolk

Panhandle Research and Extension Center — Scottsbluff

Sioux County Range — Mitchell

South Central Research and Extension Center, Great Plains Veterinary Educational Center, and the U.S. Meat Animal Research Center (USDA) — Clay Center

Southeast Research and Extension Center — Lincoln

West Central Research and Extension Center — North Platte

Faculty

Approximately 312 faculty members have research appointments in ARD. Most have joint appointments, with teaching or extension responsibilities as well. Some faculty have responsibilities other than ARD research (rsch), extension (ext) or teaching (tch). Administrative appointments, as well as appointments with centers and other UNL units or with the USDA Agricultural Research Service (other), also are noted here.

The School of Natural Resource Sciences was formed in August 1997. The School was formed from the merger of the Department of Agricultural Meteorology, Department of Forestry, Fisheries and Wildlife and the Water Center/Environmental Programs. In addition, several faculty from other units within the University transferred all or part of their appointment to the School.

ARD programs depend on many linkages and cooperative arrangements in order to make the most effective use of limited resources and to address problems of mutual interest. The USDA Agricultural Research Service (ARS) has about 25 scientists located on the UNL campus. Historically there has been a very close working relationship between these scientists, all holding adjunct faculty status, and UNL faculty. Four departments contain ARS scientists: the Departments of Agronomy and Horticulture, Entomology, Plant Pathology and Biological Systems Engineering. ARS scientists are noted as USDA in the *other* category.

UNL scientists also cooperate closely with many ARS faculty at the Roman L. Hruska Meat Animal Research Center (MARC) at Clay Center, Nebraska. There are about 55 scientists at the MARC facility, many of whom also hold UNL faculty status in the Department of Animal Science. MARC scientists are noted as USDA in the *other* category.

Another federal facility located on campus is the U.S. Forest Service National Agroforestry Center. USFS scientists also work closely with UNL faculty and hold adjunct faculty status. The Departments of Entomology and Forestry, Fisheries and Wildlife have adjunct faculty noted as USDA in the *other* category.

The USDA Natural Resources Conservation Service has personnel located in UNL facilities at the West Central Research and Extension Center, North Platte. The NRCS professional personnel there as well as those at the federal center, Lincoln, work closely with ARD faculty on a number of natural resources related activities.

The Department of Animal Science has a unique relationship with its industry supporters. Several industry representatives also hold adjunct appointments in the department and are noted as industry in the *other* category.

The percentages listed represent the proportion of a faculty member's time assigned to each function. The primary research responsibility is identified for each. All ARD off-campus personnel who are located at Centers are associated with an on-campus department as well [Department/(Area of Responsibility)]. Faculty rank and assignment percentages are based on the fiscal year 2000-2001 departmental budgets.

Agricultural/Natural Resources Units

Agricultural Economics

	Rank	Rsch	Ext	Tch	Other	Area of Responsibility
Jeffrey S. Royer	Professor	0.52	0.18	0.30		Head
John C. Allen	Professor	0.35	0.50	0.08	0.07	Director, Center for Rural Community, Revitalization and and Development; Rural Sociology
J. David Aiken	Professor	0.45	0.25	0.30		Agricultural and Natural Resources Law
Azzeddine Azzam	Professor	0.70		0.30		Research and Quantitative Methods, Industrial Organization of Food Processing
Oscar Burt	Adjunct Professor					Agricultural Production Economics, Natural Resources, Econometries and Dynamic Optimization
Dennis Conley	Professor	0.45		0.55		Agribusiness
Sam M. Cordes	Professor	0.40	0.60			Rural Health Policy
Lilyan Fulginiti	Professor	0.75		0.25		Agricultural Policies/Production
Konstantinos Giannakas	Assistant Professor	0.75		0.25		Food and Agribusiness Marketing
Glenn A. Helmers	Professor	0.60		0.40		Farm Management, Agricultural Finance Policy
Bruce B. Johnson	Professor	0.45		0.55		Resource and Community Economics
H. Douglas Jose	Professor	0.20	0.80			Farm and Ranch Management, Agricultural Finance Policy
Bettina Klaus	Assistant Professor	0.25			0.75	Microeconomic Theory
Gary Lynne	Professor	0.75		0.25		Natural Resource Economics
Richard Perrin	Professor	0.75		0.25		Production Economics
E. Wesley F. Peterson	Professor	0.75		0.25		International Trade, Development and Policy
George H. Pfeiffer[1]	Associate Professor	0.25		0.75		Farm and Ranch Management
Raymond J. Supalla	Professor	0.75		0.25		Natural Resource Economics

Agricultural Leadership, Education and Communication

Susan Fritz	Associate Professor	0.25		0.75		Leadership Development
John E. Barburto Jr.	Assistant Professor	0.25	0.25	0.50		Leadership Development
James W. King	Associate Professor	0.25		0.75		Distance Education
S. Kay Rockwell	Professor	0.25	0.60	0.08	0.07	Distance Education Policy

[1] Ended research appointment during 2000-2001
[2] Began research appointment during 2000-2001

Agronomy and Horticulture

	Rank	Rsch	Ext	Tch	Other	Area of Responsibility
Kenneth G. Cassman	Professor	0.55	0.25	0.20		Head
Bruce E. Anderson	Professor	0.25	0.75			Forage Management
Timothy J. Arkebauer	Associate Professor	0.85		0.15		Crop Environmental Physiology
P. Stephen Baenziger	Professor	0.75		0.25		Small Grains Breeding and Genetics
Robert M. Caldwell	Assistant Professor	0.40	0.60			Cropping Systems Specialist
Max Clegg[1]	Associate Professor	0.75		0.25		Crop Physiology/K-12 Coordinator
Dermot P. Coyne[1]	Professor	0.96		0.04		Vegetable Breeding
Thomas Clemente	Assistant Professor	0.50		0.10	0.40	Plant Transformation Specialist
Achim Dobermann	Associate Professor	0.70	0.30			Soil Fertility/Nutrient Management
John W. Doran	Professor				USDA	Soil Biochemistry
Rhae A. Drijber	Associate Professor	0.60		0.40		Soil Microbiology Ecology
Ismail Dweikat	Assistant Professor	0.80		0.20		Sorghum Geneticist
Jerry D. Eastin	Professor	0.85		0.15		Crop Physiology
Charles A. Francis	Professor	0.43	0.35	0.22		Farming and Landscape Design
Roch E. Gaussoin	Associate Professor	0.25	0.75			Turfgrass Management and Physiology
Kulvinder Gill	Assistant Professor	0.80		0.20		Plant Molecular Cytogeneticist
George L. Graef	Professor	0.85		0.15		Soybean Breeding and Genetics
Robert Graybosch	Professor				USDA	Wheat Genetics
Laurie Hodges	Associate Professor	0.25	0.75			Vegetable Production and Development
Garald L. Horst	Professor	0.40		0.60		Turfgrass Physiology and Management
Donald J. Lee	Associate Professor	0.40		0.60		Plant Genetics
John Lindquist	Assistant Professor	0.80		0.20		Weed Ecophysiologist
Sally Mackenzie	Professor	0.50		0.10	0.40	Plant Geneticist/Program Leader, Plant Science Initiative
Martha Mamo	Assistant Professor	0.25		0.75		Soil Chemistry/Biochemistry
Jerry Maranville[1]	Professor	0.85		0.15		Sorghum Physiology
John P. Markwell	Professor	0.10			0.90	Plant Biochemist
Alexander Martin	Professor	0.33	0.67			Weed Science, Extension Coordinator
Stephen C. Mason	Professor	0.50		0.50		Crop Production
Martin A. Massengale	Professor	0.37	0.26	0.12	0.25	Grassland Forages/Director of the Center for Grassland Studies
Robert A. Masters	Professor				USDA	Range Weed Control
Dennis McCallister	Associate Professor	0.40		0.60		Soil Chemistry
David A. Mortensen[1]	Professor	0.75		0.25		Weed Science
Lowell E. Moser	Professor	0.35		0.65		Forage Physiology
Lenis A. Nelson	Professor	0.50	0.50			Crop Variety Evaluation/New Crops
Ellen T. Paparozzi	Professor	0.50		0.50		Ornamentals
Jeffrey Pedersen	Professor				USDA	Sorghum Genetics and Breeding
William L. Powers[1]	Professor	0.88		0.12		Soil Physics
Paul E. Read	Professor	0.50	0.25	0.25		Plant Tissue Culture and Viticulture
Terrance P. Riordan	Professor	0.65	0.15	0.20		Turf Breeding
W. Ken Russell	Assistant Professor	0.80		0.20		Plant Quantitative Genetics/Statistical Genomics
Walter H. Schacht	Associate Professor	0.60		0.40		Range Science
James S. Schepers	Professor				USDA	Soil Chemistry
John Shananan	Assistant Professor				USDA	Crop Physiology
Robert C. Shearman	Professor	0.70	0.30			Sustainable Turf Systems
James E. Specht	Professor	0.80		0.20		Soybean Physiology and Breeding
Paul E. Staswick	Professor	0.85		0.15		Molecular Genetics
James Stubbendieck	Professor	0.25		0.25	0.50	Range Ecology/Management/Director of the Center for Great Plains Studies
Gary E. Varvel	Associate Professor				USDA	Soil Management
Kenneth P. Vogel	Professor				USDA	Grass Breeding
Daniel T. Walters	Professor	0.65		0.35		Soil Management
J. Troy Weeks	Assistant Professor				USDA	Sorghum Molecular Biology
Brian Wienhold	Assistant Professor				USDA	Soil Fertility
Wallace W. Wilhelm	Professor				USDA	Crop Physiology

Animal Science

	Rank	Rsch	Ext	Tch	Other	Area of Responsibility
Donald H. Beermann	Professor	0.35	0.34	0.31		Head
Mary M. Beck	Professor	0.70		0.30		Poultry Physiology
Gary L. Bennett	Professor				USDA	Systems
Dennis R. Brink	Professor	0.30		0.70		Ruminant Nutrition
Chris R. Calkins	Professor	0.70		0.30		Meats
Ronald K. Christenson	Professor				USDA	Physiology
Edgar T. Clemens[1]	Professor	0.50		0.50		Gastroenteric Physiology
L. Davis Clements[1]	Professor	0.18	0.07		0.75	Meat and Poultry By-products
Larry V. Cundiff	Professor				Acad	Beef Genetics
Andrea S. Cupp[2]	Assistant Professor	0.70		0.30		Beef Physiology
Michael J. D'Occhio	Professor				USDA	Physiology
Galen E. Erickson[2]	Assistant Professor	0.50	0.40	0.10		Feedlot Nutrition
Calvin L. Ferrell	Professor				USDA	Nutrition
J. Joe Ford	Professor				USDA	Physiology
Richard J. Grant	Associate Professor	0.70	0.30			Dairy Nutrition
Thomas G. Jenkins	Professor				USDA	Genetics
Rodger K. Johnson	Professor	0.60		0.40		Swine Genetics
Steven J. Jones	Associate Professor	0.35		0.65		Meats
Jeffrey F. Keown	Professor	0.30	0.70			Dairy Management
Roger J. Kittok	Associate Professor	0.85		0.15		Reproductive Physiology
Terry J. Klopfenstein	Professor	0.70		0.30		Ruminant Nutrition
Richard K. Koelsch	Assistant Professor	0.09	0.21		0.70	Livestock Waste Management
Mohammad Koohmaraie	Associate Professor				USDA	Meats
Larry L. Larson	Associate Professor	0.40		0.60		Dairy Physiology
Austin J. Lewis	Professor	0.70		0.30		Swine Nutrition
Kreg A. Leymaster	Professor				USDA	Genetics
Donald D. Lunstra	Professor				USDA	Physiology
Roger W. Mandigo	Professor	0.60		0.40		Meats
Phillip S. Miller	Associate Professor	0.60		0.40		Swine Nutrition
C. Todd Milton	Assistant Professor				Industry	Feedlot Nutrition
Jess L. Miner	Assistant Professor	0.70		0.30		Nutritional Biochemistry
Merlyn K. Nielsen	Professor	0.60		0.40		Genetics
J. Calvin Parrott, III	Professor				Industry	Ruminant Nutrition
Jerome C. Pekas	Associate Professor				USDA	Nutrition
Daniel H. Pomp	Associate Professor	0.75		0.25		Genetics
Rick J. Rasby	Professor	0.25	0.75			Beef Management
Thomas A. Rathje	Assistant Professor				Industry	Swine Genetics
Andrew J. Roberts	Assistant Professor				USDA	Physiology
Gary A. Rohrer	Assistant Professor				USDA	Genetics
Sheila E. Scheideler	Professor	0.45	0.50	0.05		Poultry Management
Rick A. Stock	Professor				Industry	Ruminant Nutrition
L. Dale Van Vleck	Professor	0.05		0.15	USDA	Genetics
Vincent H. Varel	Associate Professor				USDA	Bacterial Physiology
John S. Weber[2]	Assistant Professor	0.80		0.20		Functional Geomics
Brett R. White[2]	Assistant Professor	0.50		0.50		Swine Physiology
Jong-Tseng Yen	Professor				USDA	Nutrition

[1]Ended research appointment during 2000-2001
[2]Began research appointment during 2000-2001

Biochemistry

	Rank	Rsch	Ext	Tch	Other	Area of Responsibility
Robert V. Klucas	Professor	0.75		0.25		Head, Nitrogen Fixation
Lori A. Allison	Assistant Professor	0.80		0.20		Plant Molecular Genetics
Ruma V. Banerjee	Professor	0.85		0.15		Mechanistic Enzymology
Xin Bi	Assistant Professor	0.80		0.20		Regulating Gene Expressions
Raymond Chollet	Professor	0.80		0.20		Photosynthesis
Vadim N. Gladyshev	Assistant Professor	0.80		0.20		Protein Biochemistry, Selenium
Herman W. Knoche[1]	Professor	0.40		0.40		Lipid Biochemistry
John P. Markwell	Professor	0.60		0.20	0.20	Plant Biochemistry
Carolyn Price[1]	Associate Professor	0.25			0.75	Biochemistry
Stephen W. Ragsdale	Professor	0.85		0.15		Enzymes
Gautam Sarath	Associate Professor	0.80		0.20		Protein Biochemistry
Javier Seravalli	Assistant Professor				1.00	Enzymology
Robert J. Spreitzer	Professor	0.85		0.15		Plant Molecular Genetics
Shinichi Taoka	Assistant Professor				1.00	Protein Biochemistry
Donald P. Weeks	Professor	0.55		0.10	0.35	Plant Molecular Biology
Charles Wood	Professor	0.25			0.75	Virology

Biological Systems Engineering

Glenn J. Hoffman	Professor	0.35	0.50	0.15		Head
Viacheslav I. Adamchuk	Assistant Professor	0.40	0.50	0.10		Precision Agriculture
Greg Bashford	Assistant Professor				Industry	Biomedical Engineering
Leonard L. Bashford	Professor	0.41		0.30	0.29	Tractors and Design Engineering
David Billesbach	Assistant Professor	0.05			0.50	Gaseous Emissions
Rhonda M. Brand	Assistant Professor	0.50		0.50		Environmental Health Engineer
Tami Brown-Brandl	Assistant Professor				USDA	Animal Environmental and Waste Management
L. Davis Clements	Professor				Industry	RPDL Company
Roger Eigenberg	Assistant Professor				USDA	Animal Environmental and Waste Management
Dean E. Eisenhauer	Professor	0.50		0.50		Hydrologic and Irrigation
Qi Fang	Assistant Professor	1.00			Industry	Bioprocessing Engineer
Thomas G. Franti	Associate Professor	0.25	0.75			Surface Water Management
Aris Gennadios	Associate Professor				Industry	Pharmaceutical Manufacturing
John E. Gilley	Professor				USDA	Soil Erosion
Robert D. Grisso[1]	Professor	0.25	0.35	0.40		Agricultural Machinery
Milford A. Hanna	Professor	0.45		0.10	0.45	Food and Bioprocess Engineering
Terry A. Howell	Professor				USDA	Irrigation Scheduling
David D. Jones	Associate Professor	0.35		0.65		Product Handling and Storage
Michael F. Kocher	Professor	0.40		0.55	0.05	Controls Engineer
Richard Koelsch	Associate Professor	0.21	0.49		0.30	Livestock Bioenviromental Engineering
Derrel L. Martin	Associate Professor	0.65		0.35		Sprinkler Irrigation
Michael M. Meagher[1]	Associate Professor			0.20	0.80	Bioprocess Engineering
George E. Meyer	Professor	0.60		0.40		Plant Growth Modeling
Jack A. Nienaber	Professor				USDA	Animal Calorimetry
Dennis D. Schulte	Professor	0.50		0.50		Pollution Control and Energy Systems
LaVerne Stetson[1]	Professor				USDA	Agricultural Electricity
Mark Schrock[1]	Professor				USDA	Agricultural Machinery
Darrell Watts[1]	Professor	0.50	0.30			Water Quality/Irrigation
Curtis L. Weller	Professor	0.60		0.20	0.20	Food and Bioprocess Engineering
Wayne Woldt	Associate Professor	0.25	0.50		0.25	Bioenvironmental Engineering
Brian Woodbury	Assistant Professor				USDA	Animal Environmental and Waste Management

	Rank	Rsch	Ext	Tch	Other	Area of Responsibility

Biometry

David B. Marx	Professor	0.50		0.50		Head, Statistical Consultant
Erin Blankenship	Assistant Professor	0.55		0.44		Statistical Consultant
Kent Eskridge	Professor	0.60		0.40		Statistical Consultant
Stephen D. Kachman	Associate Professor	0.75		0.25		Statistical Consultant
Anne Parkhurst	Professor	0.50		0.50		Statistical Consultant
Walter W. Stroup	Professor	0.50		0.50		Statistical Consultant
Linda J. Young	Professor	0.75		0.25		Statistical Consultant

Entomology

Z B Mayo	Professor	0.62	0.29	0.09		Head, Aphid Genetics
Frederick P. Baxendale	Professor	0.25	0.75			Turf Insects
Dennis R. Berkebile	Assistant Professor				USDA	Livestock Entomology
John D. Burd[2]	Professor				USDA	Insect Plant Interactions
Stephen D. Danielson	Associate Professor	0.75		0.25		Field Crop Insect Ecology
Mary Ellen Dix	Associate Professor				USDA	Shelterbelt Insects
John E. Foster	Professor	0.50	0.50			Insect Genetics
E.A. Heinrichs	Professor				1.00	Insect-Plant Interactions
Leon G. Higley	Professor	0.80		0.20		Insect Ecology
W. Wyatt Hoback	Assistant Professor				1.00	Insect Ecology and Physiology
Scott Hutchins	Professor				1.00	Integrated Pest Management
Shripat T. Kamble[2]	Professor	0.36	0.54		0.10	Urban Pest Management
Wayne L. Kramer	Assistant Professor				1.00	Medical Entomology
Lance J. Meinke	Professor	0.80		0.20		Soil Insects
Daniel Mollenbeck	Assistant Professor				1.00	Plant Resistance to Insects
Frank Peairs	Professor				1.00	Insect-Plant Interactions
Richard D. Peterson	Assistant Professor				USDA	Livestock Entomology
Robert K. Peterson	Associate Professor				1.00	Integrated Pest Management
Philip J. Scholl[2]	Professor				USDA	Veterinary Entomology
Blair D. Siegfried	Professor	0.80		0.20		Insect Toxicology
Steven R. Skoda	Associate Professor				USDA	Livestock Entomology
C. Michael Smith	Professor				1.00	Plant/Insect Interactions
David W. Stanley	Professor	0.78		0.22		Insect Physiology
David B. Taylor	Associate Professor				USDA	Livestock Entomology

[1]Ended research appointment during 2000-2001
[2]Began research appointment during 2000-2001

	Rank	Rsch	Ext	Tch	Other	Area of Responsibility

Food Science and Technology

Steve L. Taylor	Professor	0.40	0.34	0.26		Head, Food Toxicology
Andrew K. Benson	Assistant Professor	0.60		0.40		Food Microbiology
Mindy M. Brashears[1]	Assistant Professor	0.30	0.70			Food Microbiology
Lloyd B. Bullerman	Professor	0.70	0.10	0.20		Food Microbiology/Mycology
Susan B. Cuppett	Professor	0.60		0.40		Food Lipids
Milford A. Hanna	Professor	0.20			0.80	Food and Bioprocess Engineering
Susan Hefle	Assistant Professor	0.80			0.20	Food Allergy Research
Robert W. Hutkins	Professor	0.65		0.35		Food Biotechnology
David S. Jackson	Professor	0.70	0.30			Cereals/Oilseeds Processing
Shelly McKee-Hensarling	Assistant Professor	0.70	0.15	0.15		Egg and Egg Products
Vicki Schlegel	Assistant Professor	0.25		0.10	0.65	Quality Assurance
Durward A. Smith	Associate Professor	0.25	0.60	0.15		Horticultural Food Crops Processing
Curtis L. Weller	Professor			0.20	0.80	Food and Bioprocess Engineering
Randy L. Wehling	Professor	0.50		0.50		Food Analysis
Michael G. Zeece	Professor	0.75		0.25		Food Protein Chemistry

Plant Pathology

Anne K. Vidaver	Professor	0.75	0.15	0.10		Head
James Alfano[2]	Assistant Professor				1.00	PSI Genetics of Plant-Bacterial Interactions
Martin B. Dickman	Professor	0.85		0.15		Genetics of Host/Parasite Interactions
David Dunigan[1]	Assistant Professor				1.00	Plant Progammed Cell Death
Roy C. French	Professor				USDA	Viruses and Nucleic Acids
Loren Giesler[2]	Assistant Professor	0.25	0.75			Soybean, Alfalfa & Landscape Ornamentals
Leslie C. Lane	Associate Professor	0.85		0.15		Virus Diseases
Amit Mitra	Associate Professor	0.85		0.15		Plant Vector/Plant Transformation
James E. Partridge	Associate Professor	0.50		0.50		Host/Parasite Interactions/Stress
Thomas O. Powers	Associate Professor	0.80		0.10		Nematology
James R. Steadman	Professor	0.90		0.10		Epidemiology of Vegetable Diseases
Drake C. Stenger	Assistant Professor				USDA	Wheat Virology
Allen Szalanski[1]	Assistant Professor				1.00	Molecular Diagnostics
James L. Van Etten	Professor	1.00				Molecular Virology
John E. Watkins	Professor	0.25	0.75			Small Grains, Turf and Alfalfa
Gary Y. Yuen	Associate Professor	0.85		0.15		Soilborne Diseases

[1]Ended research appointment during 2000-2001
[2]Began research appointment during 2000-2001

School of Natural Resource Sciences

	Rank	Rsch	Ext	Tch	Other	Area of Responsibility
Edward T. Elliott	Professor	0.42	0.33	0.25		Director
Tala Awada[2]	Assistant Professor	0.80		0.20		Plant Ecophysiology
Jerry F. Ayers	Associate Professor	0.15		0.25	0.60	Environmental Geophysics, Hydrogeology
Blaine L. Blad[1]	Professor	0.75		0.25		Director
James R. Brandle	Professor	0.70		0.30		Forestry\Windbreaks
Ronald M. Case[1]	Professor	0.25		0.75		Wildlife
Xun-Hong Chen	Associate Professor	0.25		0.08	0.67	Hydrogeology
Steven D. Comfort	Associate Professor	0.75	0.25			Soil Environmental Chemist
Anatoly A. Gitelson	Professor	0.50			0.50	Remote Sensing
David C. Gosselin	Associate Professor	0.65		0.10	0.25	Earth Science
Mark O. Harrell	Professor	0.25			0.75	Forest Entomology
F. Edward Harvey	Assistant Professor	0.55		0.20	0.25	Hydrogeology
Michael J. Hayes	Assistant Professor	1.00				Agricultural Climatology
Geoffrey M. Henebry[2]	Associate Professor				1.00	Landscape Ecology/Remote Sensing
Gary L. Hergenrader	Professor	0.10	0.10	0.10	0.70	State Forester
Kyle D. Hoagland	Professor	0.75		0.25		Limnology
John Holtz	Assistant Professor	0.12			0.88	Limnology/Lake Management
Qi Hu	Assistant Professor	0.55	0.35	0.10		Agricultural Climatology
Kenneth G. Hubbard	Professor	0.70	0.20	0.10		Agricultural Climatology
Ron J. Johnson	Professor	0.31	0.69			Wildlife Management
Scott J. Josiah	Assistant Professor	0.25	0.75			Forestry
Robert D. Kuzelka	Associate Professor	0.30	0.35	0.35		Assistant Director, Water Center/ Environmental Programs
Glen E. Martin	Assistant Professor				1.00	Water Science
James W. Merchant	Professor	0.15		0.25	0.60	Geographic Information Systems
Steve J. Meyer	Associate Professor		0.50	0.25	0.25	Agricultural Climatology
Edward J. Peters	Professor	0.25		0.75		Fisheries
Donald C. Rundquist	Professor	0.25		0.35	0.40	Remote Sensing
Joseph M. Skopp	Associate Professor	0.50		0.50		Soil Physics
Daniel D. Snow	Assistant Professor				1.00	Hydrogeochemistry
Michele M. Schoeneberger	Assistant Professor				USDA	Forestry
Patrick J. Shea	Professor	0.55		0.20	0.25	Environmental Chemistry of Xenobiotics
Mary E. Spalding	Professor	1.00				Water Quality
Roy F. Spalding[1]	Professor	0.80		0.10	0.10	Hydrochemistry/Associate Director, Water Center/Environmental Programs
Shashi B. Verma	Professor	0.60		0.15	0.25	Agricultural Meteorology
Edward F. Vitzthum	Associate Professor	0.20	0.65	0.15		Associate Director, Water Center
Elizabeth A. Walter-Shea	Associate Professor	0.85		0.15		Agricultural Meteorology/Solar Radiation
David A. Wedin	Associate Professor	0.40		0.60		Ecology
Albert Weiss	Professor	0.70	0.15	0.15		Agricultural Meteorology
Donald A. Wilhite	Professor	0.85		0.15		Agricultural Climatology
C. William Zanner[2]	Assistant Professor	0.60		0.30	0.10	Soil Geomorphology

Veterinary and Biomedical Sciences

	Rank	Rsch	Ext	Tch	Other	Area of Responsibility
John A. Schmitz	Professor	0.65	0.15	0.20		Head
Raul Barletta	Associate Professor	0.90		0.10		Molecular Biology
Jeffrey Cirillo	Assistant Professor	0.85		0.15		Infectious Diseases
Ruben O. Donis	Associate Professor	0.85		0.15		Molecular Virology
Alan R. Doster	Professor				1.00	Diagnostic Pathology
Gerald E. Duhamel	Professor	0.80		0.10	0.10	Diagnostic/Research Pathology
Steve M. Ensley[2]	Assistant Professor		0.50		0.50	Veterinary Toxicology and Diagnostic
Dee Griffin	Professor		0.30	0.50	0.20	Beef Cattle Medicine
Clinton J. Jones	Professor	0.90		0.10		Molecular Virology
Laura Hungerford	Associate Professor	0.60		0.40		Physiology
Clayton L. Kelling	Professor	0.85		0.15		Research Virology
Marjorie F. Lou	Professor	0.50			0.50	Research Biochemistry
Rodney A. Moxley	Professor	0.90		0.10		Diagnostic/Research Pathology
Fernando Osorio	Professor	0.60			0.40	Diagnostic/Research Virology
Douglas G. Rogers	Associate Professor				1.00	Diagnostic/Research Pathology
Gary P. Rupp	Professor	0.50		0.50		Director, GPVEC, Beef Cattle Medicine
Norman Schneider	Associate Professor		0.25	0.50	0.25	Toxicology
Gary Sherman	Assistant Professor	0.60		0.40		Veterinary Epidemology
David Smith	Assistant Professor	0.25	0.75			Dairy and Beef Cattle Health
S. Srikumaran	Professor	0.85		0.15		Immunology
David Steffen	Associate Professor				1.00	Diagnostic Research Pathology
Eva Wallner-Pendleton[1]	Associate Professor		0.60		0.40	Avian Pathology
Robert Wills[1]	Assistant Professor	0.30	0.70			Swine Diseases

Human Resources and Family Sciences Departments

Family and Consumer Sciences

	Rank	Rsch	Ext	Tch	Other	Area of Responsibility
Julie M. Johnson	Professor				1.00	Interim Chair
Douglas A. Abbott	Professor	0.25			0.75	Youth at Risk
Rosalie Bakken[2]	Assistant Professor	0.25	0.75			Adolescent Development
Richard Bischoff	Associate Professor	0.25			0.75	Collaborataive Health Care
E. Raedene Combs[1]	Professor	0.25			0.75	Housing, Aged
Sheran Cramer	Associate Professor	0.25			0.75	Women/Economic Security
Rochelle Dalla	Assistant Professor	0.25			0.75	Migration
Elizabeth Davis	Associate Professor	0.25			0.75	Family Economics
John D. DeFrain	Professor	0.25	0.75			Youth at Risk
Carolyn Edwards	Professor	0.25			0.75	Cultural Diversity/Early Childhood
Li-Wen Lin[2]	Assistant Professor	0.25			0.75	Intergenerational Cultural Diversity
Kathy Prochaska-Cue	Associate Professor	0.25	0.75			Family Management
Mary Ellen Rider	Assistant Professor	0.25	0.75			Consumer Health Policy
Pauline Davey Zeece	Professor	0.25			0.75	Child Care

Nutritional Science and Dietetics

Marilynn Schnepf	Associate Professor	0.40	0.10		0.50	Chair
Julie A. Albrecht	Associate Professor	0.25	0.75			Food Safety
Timothy Carr	Associate Professor	0.50			0.50	Nutritional Biochemistry
Judy Driskell	Professor	0.50			0.50	Nutrition
Nancy M. Betts	Professor	0.50			0.50	Nutrition
Fayrene Hamouz	Associate Professor	0.30	0.25		0.45	Restaurant Management
Nancy M. Lewis	Associate Professor	0.44			0.56	Nutrition
Kaye Stanek-Krogstrand	Associate Professor	0.25			0.75	Nutrition
Janos Zempleni[2]	Assistant Professor	0.50			0.50	Molecular Nutrition

Textiles, Clothing and Design

Rita C. Kean	Professor	0.32	0.08		0.60	Chair, Merchandising
Patricia Cox Crews	Professor	0.25			0.75	Interim Chair, Textile Conservation and Science
Joan Laughlin[1]	Professor	0.07			0.93	Textile Sciences
Shirley M. Niemeyer	Professor	0.25	0.75			Environmental Issues
Lois Scheyer[1]	Assistant Professor	0.50			0.50	Industrial Use of Agricultural Products

[1]Ended research appointment during 2000-2001
[2]Began research appointment during 2000-2001

Off-Campus Research Centers

Northeast Research and Extension Center

	Rank	Rsch	Ext	Tch	Other	Department (Area of Responsibility)
John F. Witkowski	Professor	0.23	0.69		0.08	Director
Michael C. Brumm	Professor	0.50	0.50			Animal Science (Swine Production)
Thomas E. Hunt	Assistant Professor	0.50	0.50			Entomology (Entomologist)
Stevan Knezevic	Assistant Professor	0.50	0.50			Agronomy/Horticulture (Weed Science)
William L. Kranz	Assistant Professor	0.25	0.75			Biological Systems Engineering (Water Quality)
Terry L. Mader	Professor	0.50	0.50			Animal Science (Beef Cattle)
Charles A. Shapiro	Associate Professor	0.50	0.50			Agronomy/Horticulture (Soils and Crop Nutrition)
David P. Shelton	Professor	0.50	0.50			Biological Systems Engineering (Soil Conservation)

Panhandle Research and Extension Center

Charles A. Hibberd	Professor	0.42	0.50		0.08	Director
Burton A. Weichenthal[1]	Professor	0.50	0.50			Animal Science (Beef Cattle)
David D. Baltensperger	Professor	0.30	0.20		0.50	Agronomy/Horticulture (Crop Breeding)
Jurg M. Blumenthal	Assistant Professor	0.50	0.50			Agronomy/Horticulture (Soil Fertility)
Dillon M. Feuz	Associate Professor	0.50	0.50			Agricultural Economics (Farm/Ranch Management)
Dale M. Grotelueschen	Professor	0.10	0.50		0.40	Veterinary and Biomedical Sciences (Diagnostic)
Bob Harveson	Assistant Professor	0.50	0.50			Plant Pathology
Gary L. Hein	Professor	0.50	0.50			Entomology (Entomology)
Drew J. Lyon	Associate Professor	0.50	0.50			Agronomy/Horticulture (Dryland Crops)
Alexander D. Pavlista	Associate Professor	0.25	0.75			Agronomy/Horticulture (Potatoes)
Patrick E. Reece	Associate Professor	0.50	0.50			Agronomy (Range and Forage)
Ivan G. Rush	Professor	0.25	0.75			Animal Science (Beef Cattle)
John A. Smith	Professor	0.50	0.50			Biological Systems Engineering (Machinery Systems)
Robert G. Wilson	Professor	0.50	0.50			Agronomy/Horticulture (Weed Science)
C. Dean Yonts	Associate Professor	0.50	0.50			Biological Systems Engineering (Irrigation)

South Central Research and Extension Center

Alan Baquet	Professor	0.14	0.78		0.08	Director
Brian Benham	Assistant Professor	0.50	0.50			Biological Systems Engineering (Water Quality Management)
Roger Elmore	Professor	0.50	0.50			Agronomy/Horticulture (Crop Production)
Richard Ferguson	Professor	0.50	0.50			Agronomy/Horticulture (Soil Fertility)
Fred W. Roeth	Professor	0.50	0.50			Agronomy/Horticulture (Weed Control/ Water Quality)
Roger Selley	Associate Professor	0.25	0.75			Agricultural Economics (Farm Management)
James Stack	Assistant Professor	0.50	0.50			Plant Pathology (Diseases)
Robert Wright	Professor	0.50	0.50			Entomology (Biological Control)

	Rank	Rsch	Ext	Tch	Other	Department (Area of Responsibility)

Southeast Research and Extension Center

Randy Cantrell	Professor	0.05	0.87		0.08	Director

West Central Research and Extension Center

Gary W. Hergert	Professor	0.44	0.45		0.07	Director
Richard T. Clark	Professor	0.43	0.57			Interim Associate Director, Agricultural Economics (Farm and Ranch Management)
Don C. Adams	Professor	0.50	0.50			Animal Science (Range Cattle Nutrition)
John B. Campbell	Professor	0.50	0.50			Entomology (Livestock/Crops)
Gene H. Deutscher[1]	Professor	0.28	0.72			Animal Science (Beef Cattle Reproduction)
Steve Ensley[2]	Assistant Professor		0.50		0.50	Veterinary and Biomedical Sciences (Veterinary Toxicology and Diagnostic)
Dale T. Lindgren	Professor	0.50	0.50			Horticulture (Ornamentals)
Nancy Norton[1]	Instructor	0.50	0.50			Agricultural Economics (Farm/Ranch Management)
José Payero[2]	Assistant Professor	0.50	0.50			Biological Systems Engineering (Irrigation and Evapo Transporation)
Jerry Volesky	Assistant Professor	0.50	0.50			Agronomy/Horticulture (Range Management)
Gail A. Wicks	Professor	0.50	0.50			Agronomy/Horticulture (Ecofarming/Weeds)

Interdisciplinary Activities

Water Center/Environmental Programs

Edward F. Vitzthum	Associate Professor	0.20	0.65	0.15		Interim Director, Coordinator, Environmental Programs
Shripat T. Kamble[1]	Professor	0.25	0.75			Pesticide Impact Assessment
Robert D. Kuzelka	Associate Professor	0.35	0.35	0.30		Assistant Director
Roy F. Spalding[1]	Professor	0.10			0.90	Associate Director

Agricultural Research Division

Darrell W. Nelson	Professor	1.00				Dean and Director
Dale H. Vanderholm	Professor	0.75			0.25	Associate Dean and Director
Marjorie J. Kostelnik[2]	Professor	0.12	0.13		0.75	Assistant Director
Steven S. Waller	Professor	0.50		0.50		Assistant Dean and Director; NCSARE Coordinator

[1]Ended research appointment during 2000-2001
[2]Began research appointment during 2000-2001

Visiting Scientists and Research Associates

The Agricultural Research Division hosted 47 visiting scientists and 67 research associates to the campus in 2000-2001. ARD research is complemented and enhanced by these collaborating scientists—it is through the sharing of knowledge and expertise that the field of science is advanced.

Visiting Scientists

Agronomy and Horticulture

Visiting Scientist: Galal El-Sherbeny
Country: Egypt
Expertise/Discipline: Crosses in wheat breeding

Visiting Scientist: Mahnaz Jabeen
Country: Pakistan
Expertise/Discipline: Wheat breeding and genetics

Visiting Scientist: Ariovaldo Luchiari Jr.
Country: Brazil
Expertise/Discipline: Precision agriculture, crop stress detection, and remote sensing

Visiting Scientist: Michael Mogorosi
Country: Botswana
Expertise/Discipline: Practical training in Pearl Millet Breeding — sponsorship with INTSORMIL

Visiting Scientist: Sebahaattin Ozcan
Country: Turkey
Expertise/Discipline: mRNA display techniques and molecular marker techniques

Visiting Scientist: Zhang Rui
Country: P.R. China
Expertise/Discipline: Nitrogen-use efficiency

Visiting Scientist: Christos Tsadilas
Country: Greece
Expertise/Discipline: Influence of municipal wastes application on soil quality

Visiting Scientist: Mario Urbani
Country: Argentina
Expertise/Discipline: Breeding sexual perennial grasses for improved nutritive value for cattle

Visiting Scientist: Ye Xingguo
Country: China
Expertise/Discipline: Wheat tissue culture and transformation research

Visiting Scientist: Guan Yanan
Country: China
Expertise/Discipline: Plant breeding and molecular markers in wheat

Animal Science

Visiting Scientist: Arianna Bolla
Country: Italy
Expertise/Discipline: Animal genetics

Visiting Scientist: Clendro Diaz
Country: Brazil
Expertise/Discipline: Swine reproduction

Visiting Scientist: Helen Fairweather
Country: Canada
Expertise/Discipline: Ruminant nutrition

Visiting Scientist: Manuel Gomez Gill
Country: Venezuela
Expertise/Discipline: Animal genetics

Visiting Scientist: Joao Luis Lopes da Costa Rocha
Country: United States/Texas
Expertise/Discipline: Animal genetics

Visiting Scientist: Ji-Woong Lee
Country: Korea
Expertise/Discipline: Animal genetics

Visiting Scientist: Xuehong Liu
Country: China
Expertise/Discipline: Animal genetics

Visiting Scientist: Namburi Singari
Country: India
Expertise/Discipline: Ruminant nutrition

Visiting Scientist: Gary Snowder
Country: United States/Idaho
Expertise/Discipline: Animal genetics

Visiting Scientist: Panwadee Sopannarath
Country: Thailand
Expertise/Discipline: Animal genetics

Biochemistry

Visiting Scientist: Fazoil Ataullakhanov
Country: Russia
Expertise/Discipline: Biophysics and computational biology

Visiting Scientist: Chris Chastain
Country: United States/Minnesota
Expertise/Discipline: Plant molecular biology and biochemistry

Visiting Scientist: Gloria Esquivel
Country Portugal
Expertise/Discipline: Biochemistry

Visiting Scientist: Loli Galvez
Country: Spain
Expertise/Discipline: Plant physiology and biochemistry

Visiting Scientist: Piotr Paneth
Country: Poland
Expertise/Discipline: Isotope fractionation studies in chemistry and biochemistry

Visiting Scientist: A. Raman
Country: Australia
Expertise/Discipline: Application of isotope ratio mass spectrometry in plant-insect interaction studies

Visiting Scientist: Valerie Terwilliger
Country: United States/Kansas
Expertise/Discipline: Isotope ratio mass spectrometry in geological and ecological studies

Visiting Scientist: Victor Vitvitsky
Country: Russia
Expertise/Discipline: Metabolic biochemistry

Visiting Scientist: Barbara Vokel
Country: Slovenia
Expertise/Discipline: Isotope fractionation studies in chemistry and geology

Entomology

Visiting Scientist: Mahmoud Ali
State/*Country:* Egypt
Expertise/Discipline: Apiculture

Visiting Scientist: Kemal Buyukguzel
State/*Country:* Turkey
Expertise/Discipline: Insect physiology

Visiting Scientist: Juan Cibrian
State/*Country:* Mexico
Expertise/Discipline: Insect physiology

Visiting Scientist: Samira S. El Shall
State/*Country:* Egypt
Expertise/Discipline: Radiation sterility

Visiting Scientist: Jaime Molina-Ochoa
State/*Country:* Mexico
Expertise/Discipline: Insect physiology

Visiting Scientist: Youngjin Park
State/*Country:* Korea
Expertise/Discipline: Insect physiology

Visiting Scientist: José Waquil
State/*Country:* Brazil
Expertise/Discipline: Host plant resistance, integrated pest management

Plant Pathology

Visiting Scientist: Mario Mehmel
Country: Germany
Expertise/Discipline: Potassium ion channel specialist

Visiting Scientist: Graciela Godoy-Lutz
Country: Dominican Republic
Expertise/Discipline: Disease management

Visiting Scientist: Frank Rabenstein
Country: Germany
Expertise/Discipline: Plant virology

Visiting Scientist: Jefferson Costa
Country: Brazil
Expertise/Discipline: Bean disease management

School of Natural Resource Sciences

Visiting Scientist: Robert Jefferies
Country: Canada
Expertise/Discipline: Ecosystem ecology

Visiting Scientist: Clarence Lehman
Country: United States/Minnesota
Expertise/Discipline: Theoretical ecology

Visiting Scientist: Stamatis Stamatiadis
Country: Greece
Discipline: Denitrification and laboratory management

Visiting Scientist: Jae Yang
Country: South Korea
Expertise/Discipline: Soil chemistry

Veterinary and Biomedical Sciences

Visiting Scientist: Seetharaman Gopinath
Country: India
Expertise/Discipline: Molecular biology/virology

Visiting Scientist: Reginaldo Bastos
Country: Brazil
Expertise/Discipline: Molecular biology

Visiting Scientist: Li-Mei Chen
Country: Taiwan
Expertise/Discipline: Bacteria pathogenesis

Post-Doctoral Research Associates

Agronomy and Horticulture

Research Associate: Usha Bishnoi
State/Country: India
Expertise/Discipline: Turfgrass transformation

Research Associate: John Brejda
State/Country: Nebraska/USA
Expertise/Discipline: Collection and evaluation of native legumes and forbs

Research Associate: Tony Buhr
State/Country: Nebraska/USA
Expertise/Discipline: Gene expression in transgenic soybean

Research Associate: Michael Burton
State/Country: Nebraska/USA
Expertise/Discipline: Models of patch dynamics with geo-spatial resources using geographic information systems

Research Associate: Shui-Zhang Fei
State/Country: China
Expertise/Discipline: Buffalograss transformation

Research Associate: Daniel Ginting
State/Country: Minnesota/USA
Expertise/Discipline: Site-specific manure application

Research Associate: Delkin Orlando Gonzalez
State/Country: Colombia
Expertise/Discipline: Genetic dissection of mitochondrial export involving the ORF239 protein in a yeast model system

Research Associate: Julie Huddle
State/Country: Texas/USA
Expertise/Discipline: Long-term vegetation in the Nebraska Sandhills; blowout penstemon

Research Associate: Gopal Krishnan
State/Country: Nebraska/USA
Expertise/Discipline: Weed management in corn and soybeans

Research Associate: Lijia Li
State/Country: China
Expertise/Discipline: Maize chromosome-specific libraries and probes

Research Associate: Gilbert Meyer-Gauen
State/Country: Germany
Expertise/Discipline: Nuclear-mitochondrial genetic interactions

Research Associate: Devinder Sandhu
State/Country: Nebraska/USA
Expertise/Discipline: Wheat molecular cytogenetics

Research Associate: Mohammad Maroof Shah
State/Country: Nebraska/USA
Expertise/Discipline: Wheat molecular cytogenetics

Research Associate: Haishun Yang
State/Country: Philippines
Expertise/Discipline: C Sequestration in Irrigated Maize Systems

Research Associate: Xingguo Ye
State/Country: China
Expertise Discipline: Wheat tissue culture and transformation research

Research Associate: Fengan Yu
State/Country: Israel
Expertise/Discipline: Gene expression in transgenic soybeans

Animal Science

Research Associate: Alexandre Caetano
State/Country: California/USA
Expertise/Discipline: Animal genetics

Research Associate: Kari Elo
State/Country: Finland
Expertise/Discipline: Animal genetics

Biochemistry

Research Associate: Mohammad Mainul Ahsan
State/Country: Bangladesh
Expertise/Discipline: Molecular biology

Research Associate: Tom Beardslee
State/Country: Nebraska/USA
Expertise/Discipline: Biochemistry

Research Associate: Sarbani Chakraborty
State/Country: Nebraska/USA
Expertise/Discipline: Molecular biologist/biochemist

Research Associate: Sanchita Roy Chowdhury
State/Country: West Bengal/India
Expertise/Discipline: Plant molecular biology

Research Associate: Shantanu Chowdhury
State/Country: India
Expertise/Discipline: Metallobiochemistry

Research Associate: Yu-Chun Du
State/Country: Japan
Expertise/Discipline: Biochemistry

Research Associate: Natalia V. Ermolova
State/Country: Russia
Expertise/Discipline: Plant Biochemistry

Research Associate: Nisso Fazliddinova
State/Country: Russia
Expertise/Discipline: Organic chemistry

Research Associate: Olga Komina
State/Country: Russia
Expertise/Discipline: Plant biochemistry

Research Associate: Boris Kornilaev
State/Country: Russia
Expertise/Discipline: Biochemistry

Research Associate: Julya Krasotkina
State/Country: Russia
Expertise/Discipline: Enzymology

Research Associate: Tapan Kundu
State/Country: India
Expertise/Discipline: EPR spectroscopy

Research Associate: Weihua Li
State/Country: China
Expertise/Discipline: Biochemistry

Research Associate: Eugene Mosharov
State/Country: Russia
Expertise/Discipline: Metabolic biochemistry

Research Associate: Devendra Naidu
State/Country: India
Expertise/Discipline: Bacteriology

Research Associate: Kuljeet Singh
State/Country: India
Expertise/Discipline: Inorganic chemistry

Research Associate: Allan Tsang
State/Country: Hong Kong
Expertise/Discipline: Molecular genetics

Research Associate: Jianmen Wu
State/Country: China
Expertise/Discipline: Molecular medicine

Research Associate: Youbin Xiang
State/Country: China
Expertise/Discipline: Plant molecular biologist

Research Associate: Wenxin Xu
State/Country: Japan
Expertise/Discipline: Plant molecular

Biological Systems Engineering

Research Associate: Lineau Rodrigues
State/Country: Brazil
Expertise/Discipline: Irrigation management

Research Associate: Ki Myong Kim
State/Country: Korea
Expertise/Discipline: Food processing

Research Associate: Keum Hwang
State/Country: Choubuk/Korea
Expertise/Discipline: Lipid chemistry, food processing

Entomology

Research Associate: Samira A. El Shall
State/Country: Egypt
Expertise/Discipline: Radiation sterility

Research Associate: Srinivas Parimi
State/Country: India
Expertise/Discipline: Insecticide toxicology

Plant Pathology

Research Associate: Dr. Angela Alleyne
State/Country: Barbados/West Indies
Expertise/Discipline: Plant pathology – pathogen variability

Research Associate: Dr. Shao-rong Chen, Ph.D.
State/Country: China
Expertise/Discipline: Plant molecular genetics

Research Associate: Dr. Ming Guo
State/Country: China
Expertise/Discipline: Bacterial genetics and plant biology

Research Associate: Dr. Kempton Horken
State/Country: Ohio/USA
Expertise/Discipline: Biochemistry

Research Associate: Dr. Zarir Vaghchipawala
State/Country India
Expertise/Discipline: Plant genetics

School of Natural Resource Sciences

Research Associate: Tala Awada
Country: Canada
Expertise/Discipline: Plant water stress

Research Associate: Xi Chen
Country: China
Expertise/Discipline: Hydrology/groundwater modeling

Research Associate: Song Feng
Country: China
Expertise/Discipline: Diagnostics of regional and global climate variations/meteorology and climatology

Research Associate: Imtiyaz Khan
Country: Nebraska/USA
Expertise/Discipline: *In situ* denitrification

Research Associate: Longcang Shu
Country: China
Expertise/Discipline: Hydrology/groundwater modeling

Research Associate: Andrew E. Suyker
Country: Nebraska/USA
Expertise/Discipline: Micrometeorology

Research Associate: Xinhua Zhou
Country: Nebraska/USA
Expertise/Discipline: Windbreak technology/modeling

Research Associate: Junhua Zhu
Country: China
Expertise/Discipline: Mass spectrometry

Veterinary and Biomedical Sciences

Research Associate: Parmod K. Mehta
State/Country: Nangal (Panjab)/India
Expertise/Discipline: Immunology

Research Associate: Mustapha Moulay Samrakandi
State/Country: Morocco
Expertise/Discipline: Microbiology

Research Associate: Delin Liang
State/Country Putian, People's Republic of China
Expertise/Discipline: Virology

Research Associate: Israrul Ansari
State/Country: India
Expertise/Discipline: Virology

Research Associate: Svitlana P. Yegorova
State/Country: Ukraine
Expertise/Discipline: Molecular biology

Research Associate: Ventzislav B. Vassilev
State/Country: Kavarna, Bulgaria
Expertise/Discipline: Molecular biology

Research Associate: Guillermo Roberto Risatti
State/Country: Rio Cuarto, Province of Cordoba, Argentina
Expertise/Discipline: Virology

Research Associate: Yunquan Jiang
State/Country: WuXi City, Jianqsu Province, People's Republic of China
Expertise/Discipline: Biochemistry

Research Associate: Yange Zhang
State/Country: People's Republic of China
Expertise/Discipline: Molecular endocrinology

Research Associate: Kostyantyn Krysan
State/Country: Ukraine
Expertise/Discipline: Molecular biology

Research Associate: Emil M. Berberov
State/Country: Sofia, Bulgaria
Expertise/Discipline: Genetics

Each faculty member with an ARD appointment has a federally-approved research project. A number of faculty have multiple projects. There are 383 research projects that were active for all or part of the 2000-2001 fiscal year in agriculture, natural resources and family sciences. Projects are generally three to five years in duration. Faculty also are part of a national network of Agricultural Experiment Station scientists located at Land Grant Universities across the United States. ARD researchers currently are involved with about 50 regional projects in which they conduct cooperative research with scientists at other universities, addressing problems of regional and national importance. They also participate in approximately 60 regional research committees which serve to exchange information and coordinate cooperative research activities among institutions.

Research projects are listed by departments. An asterisk (*) indicates that the project was discontinued in fiscal year 2000-2001.

You will note codes following the project number. The codes reveal the type of project.

Type	*Funding Source*	*Code*
Hatch	Federal and State Funds	ha
Regional Research	Federal Funds	rr
State	State Funds	st
McIntire-Stennis	Federal Funds	ms
Special Grant	Federal, State, Public and Private	sg
Competitive Grant	Federal Funds/USDA	cg
Animal Health	Federal Funds	ah

Hatch: research on all aspects of agriculture, including soil and water conservation and use; plant and animal production, protection, and health; processing, distributing, marketing, and utilization of food and agricultural products; forestry, including range products, multiple use of forest and rangelands, and urban forestry; aquaculture; family sciences, including human nutrition and family life; and rural and community development.

Regional Research: research in agriculture, natural resources and family sciences with regional importance and Nebraska application. Research is a collaborative effort with scientists from other land grant institutions and federal agencies.

State: research on all aspects of agriculture, natural resources, family sciences, and rural development that is supported entirely by state funds.

McIntire-Stennis: research relating to: 1) reforestation and management of land for the production of timber and other related products of the forest; 2) management of forest and related watershed lands to improve conditions of water flow and to protect resources against floods and erosion; 3) management of forest and related rangeland for production of forage for domestic livestock and game and improvement of food and habitat for wildlife; 4) management of forest lands for outdoor recreation; 5) protection of forest land and resources against fire, insects, diseases, or other destructive agents; 6) utilization of wood and other forest products; 7) development of sound policies for the management of forest lands and the harvesting and marketing of forest products; and 8) such other studies as may be necessary to obtain the fullest and most effective use of forest resources.

Special Grants: targeted research projects to address special needs for family sciences, agriculture, and the management of natural resources for Nebraska.

Competitive Grants: includes research in USDA national priority areas.

Animal Health: research to promote the general welfare through improved health and productivity of domestic livestock, poultry, aquatic animals, and other income-producing animals that are essential to the nation's food supply and the welfare of producers and consumers of animal products.

Agricultural/ Natural Resources Units

Agricultural Economics

10-106 rr
Private strategies, public policies, and food system performance (A.M. Azzam)

10-117 ha
Factors affecting the evolution of world agricultural markets: implications for U.S. policy (E.W.F. Peterson)

***10-125 ha**
Impacts of policies related to water, commodity programs, and energy based inputs on Nebraska farms (G.A. Helmers, D.M. Conley, M.E. Baker)

10-126 rr
Impact analyses and decision strategies for agricultural research (R.K. Perrin)

***10-130 ha**
Technical efficiency analysis for livestock and dairy operations in Nebraska (A.M. Azzam, S.M. Azzam)

***10-131 ha**
Selected input markets in agriculture: fuels price risk and tractor demand (D.M. Conley)

10-132 rr
Water conservation, competition and quality in western irrigated agriculture (R.J. Supalla)

***10-133 sg**
Partnership for rural Nebraska (J.C. Allen, S.M. Cordes)

10-135 ha
Monitoring and analysis of farm real estate market developments in Nebraska (B.B. Johnson)

10-137 cg
Evaluation of the productivity environment tradeoff: a Great Plains case study (R.K. Perrin)

10-138 ha
Measurement and explanation of the competitiveness of the United States in the markets for beef, soy (L.E. Fulginiti)

10-139 ha
Rural sustainability: the relationship between community structure, agricultural structure and social class (J.C. Allen)

10-140 ha
The measurement of efficiency in resource use in rural areas: a stochastic frontier analysis (S.M. Cordes, A.M. Azzam, J.C. Allen)

10-142 rr
Competitiveness and value added in the U.S. grain and oilseed industry (D. Conley)

10-143 cg
People, place and policy in the new millenium (S.M. Cordes)

10-144 cg
Social capital: enhancing measurement, while also contributing to improved understanding and policy (S.M. Cordes, G.D. Lynne, J.C. Allen)

10-145 ha
Finding motivations and mechanisms for profitable conservation (G.D. Lynne)

10-146 ha
Enforcement issues and efficiency in the agri-food marketing system: genetic modification, organic agriculture, and government intervention (K. Giannakas)

Agricultural Leadership, Education and Communication

24-033 st
Distance education policy research: organization and administration (J.W. King, S.K. Rockwell, E.B. Russell)

24-034 st
Predictors of leader and follower behavior, and the impact of leadership development (J.E. Barbuto Jr., S. Fritz)

Agronomy

12-002 ha
Improvement and evaluation of oats and barley (P.S. Baenziger)

12-055 ha
Genetics, breeding and evaluation of common wheat and triticale for Nebraska (P.S. Baenziger)

***12-149 st**
Breeding sorghum and pearl millet for USA and developing countries (D.J. Andrews)

12-181 ha
Development of profitable reduced herbicide weed management systems through integration (A.R. Martin)

***12-193 ha**
Investigating alternative grain and oil crops for Nebraska (L.A. Nelson)

12-194 ha
Novel methods for soybean genetic improvement and genomic analysis (J.E. Specht)

***12-197 ha**
Tissue and cell physiology of sorghum (M.D. Clegg)

12-198 ha
Jasmonate regulated gene expression in soybean (P.E. Staswick)

12-201 st
Maintenance, increase and distribution of elite germplasm (J. Cross)

12-202 st
Winter wheat germplasm enhancement and performance evaluation (R.A. Graybosch)

12-204 rr
Biological and ecological basis for a weed management model to reduce herbicide use in corn (J.L. Lindquist)

12-209 ha
Procedures for assessing impacts of nonpoint agrichemicals on ground water (R.F. Spalding)

12-215 st
Development of integrated weed management strategies to improve Great Plains and Midwest grasslands (R.A. Masters)

12-225 ha
Studies on the mechanisms found in corn, sorghum and pearl millet which improve N uptake and use (J.W. Maranville)

12-227 st
Perennial forage grass breeding for Nebraska (K.P. Vogel)

***12-238 ha**
Management for sustained production of perennial warm-season grasses (W.H. Schacht)

12-241 ha
Ecological studies of Nebraska rangeland vegetation (J. Stubbendieck)

12-242 st
Defining and assessing basic indicators of soil quality and erodibility (J.W. Doran, J.E. Gilley, J.R. Ellis, G.E. Varvel)

12-243 ha
Weed distribution and demography: elucidating pest management principles for reducing herbicide use (D.A. Mortensen)

12-244 ha
Soil physical relationships for best management practices to protect water quality (W.L. Powers)

12-245 st
Development and assessment of integrated soil, water and crop management systems to control nitrate loading (J.S. Schepers, G.E. Varvel)

***12-249 st**
Integrated crop and soil management to improve nitrogen-use efficiency (W.W. Wilhelm, J.W. Doran, J.R. Ellis, G.E. Varvel, J.S. Schepers)

12-252 ha
Biosolids application and soil chemical properties: changes in phosphorus and carbon pools (D. McCallister)

12-253 rr
Characterizing nitrogen mineralization and availability in crop systems to protect water resources (D.H. Sander, D.T. Walters)

12-254 ha
Community structure and functional diversity of soil microbial communities in natural and agroecosystems (R.A. Drijber)

12-255 ha
Soybean breeding and genetic studies (G.E. Graef)

***12-256 cg**
Stability of soil microbial communities under different agroecosystems (R.A. Drijber)

12-258 st
Nutrient management for maximizing nutrient use efficiency in sorghum (J.W. Maranville)

12-259 ha
Assessment of genetic variation for end-use quality traits in soybean (D. Lee)

12-260 ha
Resource-efficient management of summer annual dryland cereal crops in Nebraska (S.C. Mason)

12-261 st
Cropping systems to optimize yield, water and nutrient use efficiency of pearl millet (S.C. Mason)

***12-262 sg**
The relevance of field-specific weed populations to performance of integrated weed management systems (D.A. Mortensen, J.A. Dieleman, A.R. Martin)

***12-263 cg**
Why weed patches persist: dynamics of edges and density (D.A. Mortensen, J.A. Dieleman)

12-264 ha
Herbage and livestock production from legume/grass pastures (B.E. Anderson)

12-265 ha
Molecular characterization and manipulation of the wheat genome for crop improvement (K.S. Gill)

12-266 cg
Effective use of carbon and nutrients in manure using site-specific application (B. Eghball, J.S. Schepers, C.A. Shapiro, R.B. Ferguson)

12-267 ha
Ecophysiology of corn - velvetleaf competition (J.L. Lindquist)

12-268 ha
Sustainable farms, landscapes and rural communities in Nebraska: an agricultural systems team approach (C.A. Francis)

12-269 ha
Cropping systems for uncertain environments: decision aids for managing soil and weather variability (R.M. Caldwell)

12-270 cg
Molecular characterization of a major gene cluster of wheat (K.S. Gill)

***12-271 sg**
IPM implementation in a corn/soybean/cotton/wheat system (D.A. Mortensen)

12-272 ha
Germination, growth, and development of selected perennial forage grasses (L.E. Moser)

12-273 ha
Selecting wheat and other cereal grains for enhanced end-use performance characteristics (P.S. Baenziger, R.A. Graybosch)

12-274 ha
Physiological bases of environmental constraints on plant growth and productivity (T.J. Arkebauer)

12-275 rr
Marketing and delivery of quality cereals and oilseeds (P.S. Baenziger)

***12-276 st**
Gene chips for economically important plants and animals (K. Gill, D. Pomp, K. Arumuganathan, P. Staswick)

12-277 ha
Quantitative genetics with focus on corn breeding and corn germplasm improvement (W.K. Russell)

12-278 ha
Dynamic nitrogen management strategies for optimizing maize yield and N use efficiency (D.T. Walters)

12-279 cg
The genetic basis of agronomic traits controlled by chromosome 3A in wheat (P.S. Baenziger, K. Gill, K. Eskridge)

12-280 cg
Spatial distribution of weed patches: the influence of habitat heterogeneity (D.A. Mortensen)

12-281 ha
Enhancing crop diversity by understanding genotype by environment interactions (L.A. Nelson)

12-282 ha
Grazingland response to seasonal grazing strategies (W.H. Schacht)

Animal Science

13-036 rr
Management systems for improved decision making and profitability of dairy herds (R.J. Grant, H.D. Jose)

13-055 rr
Biophysical models for poultry production systems (M.M. Beck)

13-086 ha
Sustainable beef growing-finishing systems (T.J. Klopfenstein, T. Milton)

***13-087 ah**
Relationship of subfunctional corpora lutea to frequency of LH pulses during the periovulatory period of cattle (J.E. Kinder)

13-096 rr
Forage protein characterization and utilization for cattle (T.J. Klopfenstein, L.E. Moser, W.H. Schacht)

13-101 ha
Genetic variation for reproduction and energy utilization (M.K. Nielsen)

13-104 ha
Optimizing the utilization of dietary fiber and lipids by dairy cows (R.J. Grant)

***13-105 ha**
Nutrition of prolific sows (A.J. Lewis, P.S. Miller)

13-110 rr
Molecular mechanisms regulating skeletal muscle growth and differentiation (S.J. Jones)

13-115 ha
Evaluation of cow/calf weaning management systems to improve economic efficiency (R.J. Rasby, T.J. Klopfenstein, T. Milton, C.R. Calkins)

***13–122 ha**
Gastrointestinal structure and function as related to nutrition and body metabolism (E.T. Clemens)

***13-126 ha**
Physiological and management aspects of expression of estrus and ovulation rate in swine (D.R. Zimmerman)

13-127 ha
Measurement and manipulation of carcass traits and influencing fresh meat value (C.R. Calkins)

***13-128 ah**
Transfer of antibiotic resistance genes between bacteroides and Prevotella species (M. Morrison)

13-129 rr
Positional and functional identification of economically important genes in the pig (D. Pomp)

13-130 ha
Physiological and nutritional aspects of improving reproduction in dairy cattle (L.L. Larson)

***13-131 cg**
Screening the pig genome for QTL controlling reproduction (D. Pomp, R.K. Johnson)

13-134 rr
Integration of quantitative and molecular technologies for genetic improvement of pigs (R.K. Johnson, D. Pomp)

***13-135 ha**
Recombinant bovine and equine gonadotropins (H.E. Grotjan)

***13-136 cg**
Synthesis and assembly of cellulose binding proteins by Ruminococcus albus (M. Morrison)

***13-137 cg**
Recombinant bovine gonadotropins (H.E. Grotjan, J.E. Kinder)

***13-138 cg**
Molecular biology of protein degradation and utilization by Prevotella ruminicola (M. Morrison)

***13-139 ha**
Regulation of gonadotropin synthesis and secretion, ovarian follicular development and testicular function pre- and postpuberty (J.E. Kinder)

13-140 ha
Role of adipose tissue in determining energy utilization in cattle (J.L. Miner)

13-141 ha
Nutritional management strategies for sustainable feedlot cattle production (T. Milton, T.J. Klopfenstein, T.L. Mader)

13-142 ha
Value-added processed and manufactured meat products (R.W. Mandigo)

13-143 rr
Enhancing the global competitiveness of U.S. red meat (C.R. Calkins, D.M. Feuz)

13-144 ha
Utilization of phosphorus in cool- and warm-season grass hay by ruminants (D.R. Brink)

13-145 rr
Genetic enhancement of health and survival for dairy cattle (J.F. Keown)

13-146 ha
Factors affecting calcium utilization in the avian and egg shell quality (S.E. Scheideler)

13-147 ha
Interrelationships among liver metabolism, nutrient intake, and growth criteria in growing-finishing barrows and gilts (P.S. Miller, A.J. Lewis)

13-148 ha
Improving the efficiency of nitrogen and amino acid utilization by pigs (A.J. Lewis, P.S. Miller)

13-150 ha
Control of luteinizing hormone secretion in male sheep (R.J. Kittok)

13-151 ah
Estrogen-calcium relationships during onset of metabolic bone disease in the aging hen (M.M. Beck)

Biochemistry

***15-073 rr**
Diversity and interaction of beneficial bacteria and fungi in the rhizosphere (R.V. Klucas)

15-076 ha
Hemoglobins in higher plants (R.V. Klucas)

15-078 ha
Genetic modification of chloroplast rubisco (R.J. Spreitzer)

15-080 ha
Characterization of human telomerase (C.M. Price)

15-081 ha
Symbiosome proteins from soybean root nodules (G. Sarath)

***15-082 cg**
Rubisco phylogenetic correction (R.J. Spreitzer)

***15-083 cg**
The role of a family of nuclear-encoded sigma factors in plastid transcription regulation (L.A. Allison)

15-085 ha
Regulation of transcription in plastids of higher plants (L.A. Allison)

15-086 ha
B_{12} enzymes and hyperhomocysteinemia (R. Banerjee)

15-087 rr
Regulation of photosynthetic processes (R. Chollet, J.P. Markwell, R.J. Spreitzer)

15-088 ha
Enzymology of anaerobic CO_2 fixation and bioremediation (S. Ragsdale)

15-089 cg
Rubisco phylogenetic correction (R.J. Spreitzer)

15-090 ha
Selenium-containing proteins (V.N. Gladyshev)

15-091 st
Strategies for developing herbicide-tolerant crops (D.P. Weeks)

15-092 st
Plant Proteomics (J.P. Markwell)

15-093 cg
The role of nuclear-encoded sigma factors in maize chloroplast development (L.A. Allison)

15-094 st
Inhibition of methane synthesis in ruminants (S.W. Ragsdale, J. Takacs, J. Miner)

Biological Systems Engineering

11-001 st
Evaluation of performance of new tractors (L.L. Bashford)

11-044 rr
Improvement of thermal processes for food (M.A. Hanna)

11-079 ha
Agricultural tractor testing board: policies and procedures (L.L. Bashford, M.F. Kocher, R.D. Grisso)

***11-097 ha**
Protein film production and evaluation (C.L. Weller)

***11-099 ha**
Improving field productivity and predicting energy requirements of soil-engaging equipment (R.D. Grisso, M.F. Kocher, L.L. Bashford)

***11-102 ha**
Identification, modeling, and design of plant sensor systems for variable-rate chemical application (G.E. Meyer)

***11-103 ha**
Managing atrazine runoff losses to improve surface water quality (T.G. Franti)

***11-105 st**
Safe and efficient use of electrical energy for irrigation, livestock, and poultry facilities (L. Stetson)

11-107 ha
Bovine rumen contents as a source of industrial enzymes and chemicals (L.D. Clements)

11-109 ha
Whole farm nutrient balance for livestock production systems (R.K. Koelsch)

11-110 ha
Variability in metering devices used in site specific crop management schemes (L.L. Bashford)

11-112 ha
Hydrologic modeling and engineering for enhancement of vegetative riparian buffers (D.E. Eisenhauer)

11-113 ha
Uptake and metabolic effects of pesticide combinations on mammalian systems (R.M. Brand)

11-114 ha
Consideration of imprecision in pollution prevention system engineering (W.E. Woldt)

11-115 ha
Improved anaerobic lagoon design and management for odor control (D.D. Schulte)

11-116 ha
Engineering problems of flow measurement and control in agricultural industries (M.F. Kocher)

11-117 ha
Application of fuzzy systems analysis in biological systems engineering (D.D. Jones)

11-118 ha
Development of simulation and optimization models for watershed management (D.L. Martin)

11-119 ha
Analysis of sorghum wax quantity and quality (C.L. Weller)

11-120 st
Development and testing of field techniques for estimating the effectiveness of vegetative filter strips (D. Eisenhauer, M. Dosskey, T. Franti, K. Hoagland, D. Marx)

11-121 ha
Fuzzy crop/weed image/signal analysis for variable-rate water and chemical application (G.E. Meyer)

Biometry

23-001 st
Applications of statistics to research in agriculture (D.B. Marx, W.W. Stroup, A.M. Parkhurst, K. Eskridge)

23-002 rr
Stress factors of farm animals and their effects on performance (A.M. Parkhurst)

***23-003 st**
Innovative design and analysis of agricultural experiments (W.W. Stroup, E.T. Paparozzi)

Entomology

17-054 ha
Biochemistry and physiology of lipids, prostaglandins and related eicosanoids in insects (D.W. Stanley)

17-061 st
Management of fly population densities in cattle feedlots to reduce adverse impacts (P. Scholl, S.R. Skoda)

17-062 ha
Arthropods associated with buffalograss and other turfgrasses in Nebraska (F.P. Baxendale)

17-064 ha
Host-plant resistance, insect genetics, and biological studies of cereal insects (J.E. Foster)

17-067 ha
The influence of shelterbelts and alfalfa on natural enemies of the bean leaf beetle, Cerotoma trifurcata (Forster) in soybeans (S.D. Danielson)

17-068 ha
Mechanisms and management of arthropod injury to plants (L.G. Higley)

17-070 ha
Bio-intensive pest management of the greenbug (Z B Mayo)

17-071 ha
Development of resistance management techniques for corn insect pests in Nebraska (B.D. Siegfried)

17-072 ha
Ecology and management of Diabrotica species (L.J. Meinke)

17-073 rr
Dynamic soybean insect management for emerging agricultural technologies and variable environments (L.G. Higley)

17-074 st
Characterization of protein changes in plants challenged by sap-feeding insects (F.P. Baxendale, T.M. Heng-Moss, R.V. Klucas, T.P. Riordan, G. Sarath)

17-075 st
Using trace elements for labeling corn tissues and insect pests for mark-recapture experiments (B.D. Siegfried, L.J. Meinke, D.C. Gosselin, T.E. Hunt, F.E. Harvey)

17-076 og
Population genetics and molecular mechanisms of resistant western corn rootworm (B.D. Siegfried, L.J. Meinke, R.J. Wright)

17-077 rr
Development of pest management strategies for forage alfalfa persistence (L.G. Higley)

Food Science and Technology

***16-044 rr**
Molecular mechanisms regulating skeletal muscle growth and differentiation (M.G. Zeece)

16-051 ha
Starch technology: production, characterization, and utilization (D.S. Jackson)

16-054 ha
Chemical and physical quality characteristics of horticultural crops and their products (D.A. Smith)

16-055 ha
Food allergies and sensitivities (S.L. Taylor, S.L. Hefle)

16-056 ha
Mold and mycotoxin hazards in foods, feeds and the environment (L.B. Bullerman)

***16-065 ha**
Genetics and physiology of Streptococcus thermophilus and other lactic acid bacteria (R.W. Hutkins)

16-066 ha
Analytical methods for food process control and measurement of processing induced changes (R.L. Wehling)

16-069 ha
Role of proteolysis in myofilament/cytoskeleton structure and integrity (M.G. Zeece, S.L. Taylor)

***16-071 rr**
Enhancing food safety through control of foodborne disease agents (C.L. Weller)

16-076 cg
Detecting internal insect infestation in wheat by near-infrared spectroscopy (R.L. Wehling)

16-077 ha
Genetics and biochemistry of stress-response systems in gram-positive bacteria and foodborne pathogens (A.K. Benson)

16-078 ha
Evaluation and characterization of antioxidants from plant sources (S.L. Cuppett)

***16-079 st**
Mapping and site-directed mutagensis of IgE epitopes in a food allergen from soybean (Gly m Bd 30k) (M.G. Zeece, J.P. Markwell, G. Sarath, D.E. Wylie)

16-080 ha
Competitive inhibition of food-borne pathogens in meat and poultry products and in cattle (M.M. Brashears)

16-081 cg
Genomic analysis of *E. coli* 0157:H7 populations from cattle and humans (A.K. Benson, R.W. Hutkins)

16-082 rr
Marketing and delivery of quality cereals and oilseeds (D.S. Jackson)

16-083 rr
Marketing and delivery of quality cereals and oilseeds (L.B. Bullerman)

16-084 cg
Extrusion processing as a means of reducing *fusarium* mycotoxins in cereal foods (L.B. Bullerman, M.A. Hanna, M.M. Castelo)

16-085 sg
CCP identification and validation during poultry production and processing (M.M. Brashears, S.R. McKee, E.A. Wallner-Pendleton)

16-086 ha
Genetics and physiology of lactic acid bacteria (R.W. Hutkins)

Horticulture

20-040 rr
Genetic improvement of beans (*Phaseolus vulgaris* L.) and nutritional value for yield, pest resistance and nutritional value (D.P. Coyne, J.R. Steadman)

***20-048 ha**
Influence of sulfur and nitrogen on the growth and development of ornamental plants (E.T. Paparozzi)

20-050 ha
Cultural practices to minimize environmental stress on vegetable crop production and physiology (L. Hodges, J.R. Brandle)

20-055 ha
Genetics and breeding of dry edible beans (*Phaseolus vulgaris* L.) with emphasis on multiple disease resistance (D.P. Coyne)

20-056 ha
Integrated turfgrass management practices (R.C. Shearman)

20-057 ha
Application of micropropagation and biotechnology to improvement and multiplication of horticultural crops (P.E. Read)

20-058 ha
Exudate physiology of grasses grown under stress environments (G.A. Horst)

20-059 ha
Factors affecting prairie forb and grass establishment: interference in sustainable landscape management (G.L. Davis)

20-060 ha
Breeding and development of buffalograss for the central Great Plains (T.P. Riordan)

***20-061 st**
Development of glyphosate resistant buffalograss (T.P. Riordan, T.E. Clemente, S. Fei, R.V. Klucas)

20-062 ha
Exploring plant nutrient interactions in floricultural and ornamental crops (E.T. Paparozzi)

20-063 ha
Growing and cultural practice impacts on USGA putting greens and their microbial communities (R.E. Gaussoin)

Plant Pathology

21-012 st
Electron microscopy in agricultural research (E.M. Ball)

21-022 rr
Biocontrol of soil and residue-borne plant pathogens (G. Yuen)

21-040 ha
DNA replication and gene expression of Chlorella viruses (J.L. VanEtten)

***21-056 ha**
Detection of seedborne bacteria and characterization of bacterial endophytes (A.K. Vidaver)

21-057 rr
Genetic variability in the cyst and root-knot nematodes (T.O. Powers)

21-058 rr
Overwinter survival of Heterodera pratylenchus and associated nematodes in the North Central Region (T.O. Powers, E.D. Kerr)

***21-061 ha**
Detection and properties of plant viruses of Nebraska with emphasis on sugar beet viruses (L.C. Lane)

21-063 ha
Biological control of soilborne diseases of legumes and turfgrass with antagonistic bacteria (G.Y. Yuen)

21-064 rr
Fusarium mycotoxins in cereal grains (M.B. Dickman)

21-069 ha
Leaf rust virulence in Nebraska and management systems for turfgrass diseases (J.E. Watkins)

21-070 ha
Mitigation of diseases of dry edible bean stem rot of soybean by managed plant resistance (J.R. Steadman)

21-071 cg
Entomopathogenic nematodes for biological control of filth flies in feedlots (T.O. Powers, A.L. Szalanski)

21-072 cg
Molecular analysis of sclerotial development in *Sclerotinia sclerotiorum* (J.A. Rollins)

21-073 ha
Environmental effects on plant host-parasite interactions (J.E. Partridge)

21-074 st
Broad-spectrum virus resistance in transgenic plants (A. Mitra)

21-075 ha
Application of PCR based approaches for nematode identification and epidemiology (T.O. Powers)

21-076 ha
Pathogenic determinants of phytopathogenic fungi (M.B. Dickman)

21-078 cg
Secretion properties of the type III secretion system of pseudomonas syringae (J.R. Alfano)

21-079 ha
Characterization of soybean diseases in Nebraska and development of plant disease management strategies in soybean and landscape plants (L. Giesler)

School of Natural Resource Sciences

12-239 ha
Processes associated with long-term fate and detoxification of organonitrogen contaminants in soil (P.J. Shea)

26-025 ms
Biological and tree-injection methods for controlling tree pests (M.O. Harrell)

26-027 ha
Integrating biological diversity into managed land-use systems (R.J. Johnson)

27-003 ha
Exchange of carbon dioxide and other atmospheric trace gases in vegetated ecosystems (S.B. Verma)

***27-004 ha**
Remotely sensed estimates of productivity, energy exchange processes and water stress in vegetation (B.L. Blad, E.A. Walter-Shea)

27-007 ha
Drought: response and policy implications (D.A. Wilhite)

***27-008 rr**
Climate and agricultural landscape productivity analysis and assessment in the North Central Region (K.G. Hubbard)

27-011 ha
Relationships between remotely-sensed spectral properties of vegetated surfaces and biophysical properties (E.A. Walter-Shea)

27-012 rr
NADP - A long term monitoring program in support of research on the effects of atmospheric chemical deposition (S.B. Verma)

27-016 ha
Climate change and the winter wheat agroecosystem: experiments and modeling (A. Weiss)

27-017 ha
Remodeling the surface energy budgets with a universal crop coefficient and natural variability specifications (K.G. Hubbard)

***40-001 sg**
Developing drought mitigation and preparedness technologies for the U.S. (D.A. Wilhite)

40-002 ha
Remediating organic contaminants in soil and water through natural and accelerated attenuation (S.D. Comfort)

40-003 ha
Effects of atrazine on algal communities in aquatic ecosystems in the midwest (K.D. Hoagland)

***40-004 ha**
Nebraska participation in the national agricultural pesticide impact assessment program (S.T. Kamble)

40-005 ha
Ecology of pallid sturgeon and associated fishes in the Platte River, Nebraska (E.J. Peters)

40-006 ms
Linking special forest products, markets and sustainable agroforestry systems (S.J. Josiah, J.R. Brandle)

40-007 ms
Consequences of woody species establishment in the Great Plains (D. Wedin)

40-008 ha
Interannual and interdecadel variation of precipitation and temperature in Nebraska and surrounding states (Qi "Steve" Hu)

40-010 sg
Developing drought mitigation and preparedness technologies for the U.S. (D.A. Wilhite)

40-011 ms
Windbreak shelter effects (J.R. Brandle, L. Hodges, S. Josiah)

40-012 rr
Impact climate and soils on crop selection and management (K. Hubbard)

40-013 ha
Rapid estimation of soil hydraulic properties (J. Skopp)

Veterinary and Biomedical Sciences

14-009 rr
Prevention and control of enteric diseases of swine (R.A. Moxley)

14-014 rr
Bovine respiratory disease (S. Srikumaran)

14-039 st
Research laboratory and animal care facility (J.A. Schmitz, A. Hogg, T.E. Socha)

14-059 st
Veterinary diagnostic lab system: diagnostic surveillance and disease investigation in Nebraska livestock and poultry (J.A. Schmitz, A.R. Doster, J.L. Johnson, D.M. Groteluesch en)

***14-085 rr**
Research in support of a national eradication program for pseudorabies (F.A. Osorio)

***14-086 cg**
Molecular characterization of Pasteurella haemolytica leukotoxin-receptor interactions (S. Srikumaran)

***14-091 cg**
Molecular characterization of MHC class I down-regulation by bovine herpesvirus I (S. Srikumaran)

14-093 ah
Bovine respiratory syncytial virus glycoprotein interactions in a homologous host cell receptor (C. Kelling)

14-094 ah
Molecular characterization of animal RNA viruses and their interactions with the host (R.O. Donis)

14-095 ah
Interaction of porcine reproductive and respiratory syndrome virus and *Salmonella cholerasius* (R.W. Wills, F.A. Osorio)

14-096 ah
Functional analysis of the BHV-1 latency related gene (C. Jones)

14-097 cg
Functional analysis of bovine herpes virus I latency related gene products (C. Jones)

14-098 st
Monitoring individual animal performance to evaluate beef cattle production and economics (G.P. Rupp, D.D. Griffin)

14-099 cg
Cis-acting elements in the replication of the bovine viral diarrhea virus genome (R.O. Donis)

14-100 cg
Analysis of apoptosis and pathogenesis by bovine herpes virus and BICPO (C. Jones, A.R. Doster)

14-101 cg
Role of *E. coli* heat-labile enterotoxin-I in diarrhea and septicemia in swine (R.A. Moxley, R.G. Barletta)

14-102 ha
Strategic plan for an IANR field disease research program at the Department of Veterinary and Biomedical Sciences (D.R. Smith)

14-103 ah
Pathogenic mechanisms of bacterial respiratory pathogens (J.D. Cirillo)

14-104 cg
Identification of mycobacterium paratuberculosis virulence determinants (R.G. Barletta)

14-105 cg
The effect of PRRSV on the immune system during acute and persistent infection (F.A. Osorio, F. Zuckerman, A.R. Doster)

14-107 ha
Theoretical and applied molecular biology or porcine gonadotropins (G.B. Shearman)

14-108 ah
Molecular genetic analysis of *Mycobacterium paratuberculosis* and related mycobacterial pathogens (R.G. Barletta)

14-109 ha
Epidemiology of *Escherichia coli* 0157:H7 and *salmonella* in feedlot beef cattle (D.R. Smith, R.A. Moxley, L.L. Hungerford, J.T. Gray, T.J. Klopfenstein)

14-110 cg
Inhibition of apoptosis by the bovine herpes virus I latency related gene (C. Jones, A. Doster)

14-111 cg
A novel strategy to test and monitor beef feedlot food-safety control points (D. Smith, L. Hungerford, J. Gray, R. Moxley, T. Klopfenstein)

14-112 cg
GP 96 as molecular chaperone for antigen delivery in viral systems (S. Srikumaran)

14-113 sg
A workshop on epidemiologic methods and approaches to food safety (R. Wills)

14-114 cg
Role of macrophages in the pathogenesis of porcine colonic spirocheposis (G. Duhamel, J. Cirillo)

14-115 rr
Porcine reproductive and respiratory syndrome (PRRRS) (F.A. Osorio, R. Wills)

14-116 ha
Geospatial analysis and animal health (L. Hungerford)

Human Resources and Family Sciences Departments

Family and Consumer Sciences

***92-020 rr**
The role of housing in rural community vitality (E.R. Combs)

92-021 ha
Impact of Head Start on rural children, families, and communities (P.D. Zeece)

92-022 ha
Retirement economic well-being for women in Nebraska and cross-culturally (S.L. Cramer)

92-023 ha
Economic well-being of Nebraska household: a comparison of alternative measures (E.P. Davis)

***92-025 ha**
Family functioning of interracially constituted families (S. Baugher)

92-026 ha
Surviving and transcending a traumatic childhood (J. DeFrain)

92-028 ha
High hopes and bright futures: successful teens in Nebraska (D.A. Abbott, W.H. Meredith)

***92-029 ha**
The impact of welfare reform on women's lives: education, job placement/retention, and resource management (K. Prochaska-Cue, B. Sparks)

92-031 ha
Economic impact of HIV/AIDS on Nebraskans (M.E. Rider)

92-032 ha
The new relational perspective in developmental psychology and its applications to education and child care (C.P. Edwards)

92-033 ha
Into the heartland: a contextual examination of migration and its impacts on rural Nebraskan meat-packing communities (R.L. Dalla)

92-035 rr
Rural low-income families: monitoring their well-being and functioning in the context of welfare reform (K. Prochaska-Cue)

92-036 ha
Outcomes in the collaborative management of mental health treatment within a primary care medical setting (R.J. Bischoff)

Nutritional Science and Dietetics

91-042 rr
Bioavailability of nutrients: a key to human nutrition (J.A. Driskell)

91-043 rr
Health maintenance aspects of dietary recommendations designed to modify lipid metabolism (N.M. Lewis)

91-045 rr
Using stages of change model to promote consumption of grains, vegetables and fruits by young adults (N.M. Betts)

91-046 ha
Exercise dependence and disordered eating behaviors: instrument development validation and testing (N.M. Betts)

91-047 ha
The metabolic basis of atherosclerosis (T.P. Carr)

91-048 ha
The use of edible films and natural antioxidants to control warmed-over flavor in meats (M. Schnepf)

91-049 ha
Nutritional knowledge, practices, beliefs of caregivers and practices of physicians for young children (K.L. Stanek)

91-050 ha
Health implications of folate and homocysteine as it relates to fruit and vegetable consumption (J.A. Albrecht)

91-051 ha
Assessing managerial and work force development in foodservice management (F. Hamouz)

91-052 cg
Using the stages of change model to increase fruit and vegetable intake (N. Betts)

Textiles, Clothing and Design

94-022 ha
Development of textile end-uses for wheat gluten and other farm commodity derived materials (L.E. Hamilton)

94-023 rr
Development of textile materials for environmental compatibility and human health and safety (P.C. Crews)

94-024 ha
Impacts of environmental disclosure policies and constraints on housing transaction practices (S. Niemeyer)

94-025 rr
Development of textile materials for environmental compatibility and human health and safety (L. Scheyer)

94-026 cg
Film properties of chemically modified wheat gluten binders for pigment printing (L. Scheyer)

94-027 rr
Impact of technology on rural consumer access to food and fiber products (R. Kean)

Off-Campus Research Centers

Northeast Research and Extension Center

42-007 ha
Management considerations for feedlot cattle exposed to environmental stressors (T.L. Mader, C.T. Milton)

***42-014 ha**
Biology and control of the European corn borer bean leaf beetle and other selected insects in northeast Nebraska (J.F. Witkowski)

42-017 ha
Determination of crop residue cover using electronic image analysis (D.P. Shelton)

42-018 rr
Integrated crop management effects on stalk-boring Lepidoptera (J.F. Witkowski)

42-022 cg
Dynamic responses of feedlot cattle exposed to heat stress (T.L. Mader, D.E. Spiers, J.A. Nienaber, J.L. Morrow-Tesch, A.M. Parkhurst)

42-023 ha
Modifying pig performance through facility and diet management (M.C. Brumm)

42-024 ha
Utilizing animal manures and fertilizers in cropping systems for northeast Nebraska (C.A. Shapiro)

42-025 ha
Integrated weed management (IWM) for eastern Nebraska (S.Z. Knezevic)

42-026 ha
Developing economic thresholds for insect pests of conventional and value-added crops in northeast Nebraska (T.E. Hunt)

42-027 ha
Developing operational criteria for application of swine lagoon water via center pivot (W.L. Kranz)

Panhandle Research and Extension Center

44-004 st
Fertilizer and manure application for production of continuous corn (D.D. Baltensperger)

44-016 ha
Weed control systems for western Nebraska irrigated crops and rangeland (R.G. Wilson)

44-035 ha
Feed resources and beef production systems in western Nebraska to optimize total efficiency (I.G. Rush, B.A. Weichenthal)

44-042 ha
Agricultural enhancement of potato production and utilization (A.D. Pavlista)

44-051 ha
Agrichemical control in irrigation runoff water from surface irrigated fields (C.D. Yonts, R.G. Wilson)

44-052 ha
The economics of alternative beef cattle marketing and feeding strategies (D.M. Feuz)

44-053 ha
Machinery systems management for sugarbeets, dry edible beans, and chicory (J.A. Smith, R.G. Wilson)

44-054 rr
Plant germplasm and information management and utilization (D.D. Baltensperger)

44-055 ha
Intensification of winter wheat based dryland cropping systems for western Nebraska (D.J. Lyon)

44-057 ha
Studies of drought and defoliation effects on range grasses needed to optimize future grazing research (P.E. Reece, W.H. Schacht, J.D. Volesky, L.E. Moser)

44-058 ha
Integrated management systems for arthropod pests of wheat and other crops in western Nebraska (G.L. Hein)

44-059 ha
Dynamic nitrogen management for crops grown in the high plains of Nebraska (J. Blumenthal)

44-060 ha
The ecology, etiology, and management of crop diseases important to western Nebraska (R.M. Harveson)

Roman L. Hruska U.S. Meat Animal Research Center

46-001 st
Development and operation of the U.S. Meat Animal Research Center (D. Laster)

South Central Research and Extension Center

48-016 ha
Soybean production practices and alternative crops within resource-efficient cropping systems for south central Nebraska (R.W. Elmore)

48-019 ha
Managing weeds and herbicides for profitable crop production and reduced environmental risks (F.W. Roeth)

***48-022 ha**
Crop insect pest management in Nebraska: biological control and sampling (R.J. Wright)

***48-023 ha**
Formulation of nitrogen fertilization recommendations to maximize economic and environmental goals (R.A. Selley)

48-024 cg
Epidemiology and life history of Claviceps africana in the Great Plains (J.P. Stack)

48-025 ha
Subsurface drip irrigation: Integrated water and nitrogen BMPs for corn and assessing irrigation uniformity in situ (B.L. Benham)

48-026 ha
Site-specific nutrient management strategies for irrigated and non-irrigated maize (R.B. Ferguson)

48-027 ha
Microbial management of plant diseases in sustainable production systems: microbial diversity, habitat receptivity, and pathogen populations (J.P. Stack)

48-028 ha
Spatial distribution and sampling of field crop insects (R.J. Wright)

West Central Research and Extension Center

43-057 ha
Improving the profitability and sustainability of Sandhills beef cattle operations (R.T. Clark)

43-058 ha
Biology, ecology, economics and control of major insects affecting cattle in Nebraska (J.B. Campbell)

43-059 ha
Production systems and nutrition for Sandhills and Northern Great Plains range (D.C. Adams)

43-060 rr
Management of arthropod pests of livestock and poultry (J.B. Campbell, G.D. Thomas)

43-061 ha
Management practices to improve reproduction of beef heifers (G.H. Deutscher)

***43-062 ha**
Genotype by environment interactions for sow productivity and early piglet growth (T.E. Long)

43-063 ha
Grazing management strategies and systems for Sandhills meadows (J.D. Volesky)

43-065 ha
Integrated weed management in reduced tillage systems in low rainfall environments (G.A. Wicks)

43-066 ha
Selection, development and propagation of native herbaceous landscape plants (D.T. Lindgren)

43-067 ha
Economic and nitrate leaching implications of water conservation in Nebraska irrigated agriculture (N.A. Norton, R.T. Clark)

43-068 ha
Improving fertilizer management and recommendations for precision agriculture (G.W. Hergert)

Interdisciplinary Activities

Administration

01-001
General administration of federal fund research (D.W. Nelson)

01-004
Regional research coordination, North Central Region (D.W. Nelson)

Agricultural Research and Development Center

45-001 st
Field laboratory development (D. Duncan)

Center for Grassland Studies

33-001 st
Center for grassland studies (M.A. Massengale)

33-002 rr
Improved grazing systems for beef cattle production (R. Clark, T.J. Klopfenstein)

Center for Sustainable Agriculture Systems

31-002 st
Center for sustainable agricultural systems (C.A. Francis)

***31-004 sg**
Integrated crop/livestock research for sustainable systems (C.A. Francis, T.J. Klopfenstein, J. Brandle)

31-005 sg
Integrated crop/livestock/agroforestry research for sustainable systems in Nebraska (T.J. Klopfenstein, J.R. Brandle, C.A. Francis)

Food Processing Center

19-003 st
Development and evaluation of food products, processes and markets (S.L. Taylor)

***19-004 sg**
Midwest food manufacturing alliance (S.L. Taylor)

19-008 sg
Development and quality/safety enhancement of specialty food products (S.L. Taylor)

19-009 sg
Midwest advanced food manufacturing alliance (S.L. Taylor)

19-010 sg
Development and quality/safety enhancement of speciality food products (S. Taylor)

19-011 sg
Alliance for food protection (S. Hefle)

Industrial Agricultural Products Center

***29-007 sg**
Industrial agricultural products center (M.A. Hanna)

***29-008 st**
Biodegradable plastics from corn starch and soybean oil (M.A. Hanna, V. Miladinov)

29-010 sg
Industrial Agricultural Products Center (M.A. Hanna)

Publications

While serving the needs of Nebraska's agricultural producers, agribusinesses, industries, communities and citizens, the ARD places a high priority on being accountable for its resources and documenting impacts of its programs. As in all research institutions, ARD scientists are charged to actively disseminate results of research in scientific journals and technical publications. The division sets optimistic, but reachable, annual goals for scientific publication, theses and dissertations, and other measures of research output. In each of the last three years the goals have been exceeded.

Publications in refereed (peer reviewed) scientific journals represent professional acknowledgment of the value of a research finding to the discipline. ARD scientists have published in a number of different scientific journals during 2000. Faculty also have written books, edited books or contributed chapters for books.

Another major contribution of the ARD research faculty is the education of graduate students pursuing a Master of Science (M.S.) or Doctor of Philosophy (Ph.D.) degree. One responsibility of a graduate degree is the completion of a thesis (M.S.) or a dissertation (Ph.D.)

Publications in refereed journals, books, book chapters, refereed proceedings, theses and dissertations are listed for calendar year 2000.

Journals in which faculty have published in 2000

Agricultural Economics

Agricultural Economics
International Journal of Water Resources Development
Journal of Agricultural Economics
Review of Agricultural Economics
Rural America
Rural Sociology
Southern Economic Journal

Agricultural Leadership, Education and Communication

Educational Technology
Journal of Agricultural Education
Journal of Psychological Type
Leadership Quarterly
Online Journal of Distance Learning Administration
Psychological Reports

Agronomy and Horticulture

African Crop Science Journal
Agriculture, Ecosystems and Environment
Agriculture Systems
Agronomy Journal
American Journal of Alternative Agriculture
American Journal of Potato Research
Analytical Chemistry
Archives of Biochemistry and Biophysics
Cereal Chemistry
Compost Science and Utilization
Crop Science
Environmental Pollution
Environmental Toxicology and Chemistry
Euphytica
HortScience
International Archives of Allergy Immunology
Journal of the American Society for Horticultural Science
Journal of Entomological Science
Journal of Environmental Quality
Journal of Family and Consumer Sciences
Journal of Hydrology
Journal of Phytoremediation
Journal of Plant, Cell, Tissue and Organ Culture
Journal of Range Management
Journal of Soil and Water Conservation
Journal of Sustainable Agriculture
Journal of Range Management
Mycologia
Online Journal of Animal Science
Plant Science

Plant and Soil
Soil Biology and Biochemistry
Soil Science
Soil Science Society of America Journal
The Prairie Naturalist
Transactions of the American Society of Agricultural Engineers
Weed Science
Weed Technology

Animal Science

American Journal of Physiology
Animal Feed Science and Technology
Asian-Australian Journal of Animal Science
Cell and Tissue Research
Crop Science
FEMS Microbiology Letters
Journal of the American Dietetic Association
Journal of Animal Science
Journal of Applied Poultry Research
Journal of Dairy Science
Journal of Range Management
Journal of Swine Health and Production
Nutrition Research
Official Journal of Japanese Society of Zootechnical Science
Online Journal of Animal Science
Physiological Genomics
Poultry Science
Theoretical and Applied Genetics

Biochemistry

Archives of Biochemistry and Biophysics
Biochemistry
Biochimie
Genes and Cells
International Archives of Allergy and Immunology
Journal of American Chemical Society
Journal of Biological Chemistry
Journal of Microbiology Methods
Journal of Theoretical Biology
Phytopathology
Plant Physiology
Plant Science
Proceedings of the National Academy of Science
Structure

Biological Systems Engineering

Agricultural Systems
Annals of Biomedical Engineering
Applied Engineering in Agriculture
Cereal Foods World
Computers and Electronics in Agriculture
Food Science Biotechnology
Industrial Crops and Products
Industrial Crops Production
International Journal of Food Properties
Journal of Agricultural Engineering Research
Journal of Agricultural and Food Chemistry
Journal of Food Science

Entomology

Annals of Entomological Society of America
Bulletin of Environmental Contamination and Toxicology
Chemosphere
Crop Science
Entomologia Experimentalis et Applicata
Environmental Entomology
Florida Entomologist
Great Plains Research
Journal of Economic Entomology
Journal of Entomological Science
Journal of Insect Physiology
Journal of Medical Entomology
Journal of Nematology
Molecular Phylogenetics and Evolution
Pest Management Science
Pesticide Biochemistry and Physiology
Pharmaceutical Science
Transactions of the American Society of Agricultural Engineers

Food Science and Technology

Allergy
Applied and Environmental Microbiology
Cereal Chemistry
Czech Journal Food Science
HortScience
International Archives of Allergy and Immunology
Journal of Agricultural Engineering Research
Journal of Bacteriology
Journal of Chromatography
Journal of Food Protection
Poultry Science

Plant Pathology

Archives of Virology
Biological Control
Crop Science
Horticultural Science
Journal of the American Society of Horticultural Science
Journal of Biological Chemistry
Journal of Molecular Evolution
Molecular Phylogenetics and Evolution
Mycologia
Nature Structural Biology
Physiological and Molecular Plant Pathology
Phytopathology
Plant Cell Reports
Science
The Plant Cell
The Plant Journal
Transactions of the Nebraska Academy of Sciences
Virology

School of Natural Resource Sciences

Agricultural and Forest Meteorology
Agricultural Systems
Agriculture, Ecosystems and Environment
Analytical Chemistry
Bioremediation Journal
International Journal of Phytoremediation
Journal of Contingencies and Crisis Management
Journal of Entomological Science
Journal of Climate
Journal of Microbiological Methods
Journal of the American Water Resources Association
Remote Sensing of Environment
Wildlife Society Bulletin

Veterinary and Biomedical Sciences

Archives of Virology
Infection and Immunity
Journal of Biological Chemistry
Journal of General Virology
Journal of Immunology
Journal of Virology
Molecular and Cellular Probes
Vaccine
Veterinary Microbiology
Veterinary Pathology
Veterinary Record

Family and Consumer Sciences

Cross Cultural Research
Early Childhood Education Journal
Journal of Family and Consumer Sciences
Journal of Family Issues
Journal of Sex Research

Nutritional Science and Dietetics

Dairy, Food and Environmental Sanitation
International Journal of Vitamin and Nutritional Research
Journal of American Dietetic Association
Journal of Animal Science
Journal of Family and Consumer Sciences
Journal of Food Quality
Journal of Food Sciences
Journal of Nutrition
Journal of Poultry Science
Nutrition Research
Proceedings of the Society for Experimental Biological Medicine

Textiles, Clothing and Design

Applied Engineering in Agriculture
Journal of Family and Consumer Sciences
Starch/Starke
Textile Chemist and Colorist and American Dyestuff Reporter

Northeast Research and Extension Center

Agriculture Ecosystems and Environment
Asian-Australian Animal Science
Bulletin of Environmental Contamination and Toxicology
Journal of Animal Science
Journal of Entomological Science
Journal of Swine Health Production
Transactions of the American Society of Agricultural Engineers

Panhandle Research and Extension Center

American Journal of Potato Research
Applied Engineering in Agriculture
Crop Science
Journal of Plant Growth Regulation
Journal of Sugar Beet Research
Soil Biology and Biochemistry
Soil Science Society of America Journal
The Bovine Practitioner
Weed Science

South Central Research and Extension Center

Crop Science
Journal of Economic Entomology
Journal of Environmental Quality
Journal of Kansas Entomological Society
Journal of Weed Science
Pesticide Biochemistry and Physiology

West Central Research and Extension Center

Australian Journal of Experimental Agriculture
Online Journal of Animal Science
Journal of Animal Science
HortScience
Journal of Range Management
Nebraska Agricultural Research Division Journal
The Prairie Nature
Weed Science
Weed Technology

Research Publications (2000)

Agricultural/ Natural Resources Units

Agricultural Economics

Journal Articles

Filkins, R., J.C. Allen, and S. Cordes. 2000.
Predicting community satisfaction among rural residents: An integrative model. Rural Sociology 65:72-86. (J. Series No. 12451)

Giannakas K. and M. Fulton. 2000.
The economics of coupled farm subsidies under costly and imperfect enforcement. Agricultural Economics 22:75-90. (J. Series No. 13328)

Leistritz, F.L., S. Cordes, R.S. Sell, J.C. Allen, and R. Filkins. 2000.
Immigrants to the Northern Great Plains: Survey results from Nebraska and North Dakota. Rural America 15:8-15. (J. Series No. 13166)

Peterson, E.W.F. 2000.
The design of supranational organizations for the provision of international public goods: Global environmental protection. Review of Agricultural Economics 22:355-369. (J. Series No. 10797)

Peterson, E.W.F. and S.R.K. Valluru. 2000.
Agricultural comparative advantage and government policy interventions. Journal of Agricultural Economics 51:371-387. (J. Series No. 12679)

Schroeter, J., A. Azzam, and M. Zhang. 2000.
Measuring market power in bilateral oligopoly: The wholesale market for beef. Southern Economic Journal 60:526-547. (J. Series No. 12676)

Supalla, R.J. 2000.
A game theoretic critique of institutional arrangements for Platte River management. International Journal of Water Resources Development 16:253-265. (J. Series No. 12841)

Refereed Proceedings

Conley, D. 2000.
Multi-year hedging analysis, 1973-98. *In:* Proceedings from the International Food and Agribusiness Management Association. http://tamu.edu/iama/2000Congress/2000_forum_papers.htm.

Dias, W. and G.A. Helmers. 2000.
Nonparametric efficiency analysis of public safety production, p. 79-82. *In:* Art Gowan (ed.), Proceedings of the Southeast Decision Sciences Institute, Wilmington, NC.

Helmers, G.A. and S. Shaik. 2000.
The use of the nonparametric approach in risk-return analysis, p. 58-61. *In:* Art Gowan (ed.), Proceedings of the Southeast Decision Sciences Institute, Wilmington, NC.

Wade, M. and D. Conley. 2000.
Assessing informational bias and food safety: A matrix method approach. *In:* Internal Food and Agribusiness Management Association Proceedings. http://tamu.edu/iama/2000Congress/2000_forum_papers.htm

Book Chapter

Perrin, R.K. 2000.
Economic opportunities for new genetic products, chapter 2. *In:* Designing Crops for Added Value, Agronomy Monograph. ASA, CSSA and SSSA, Madison, WI.

Research Bulletins

Perrin, R.K. and T. Klopfenstein. 2000.
Economic impact of feeding wet grain processors' byproducts in Nebraska. Research Bulletin 337. University of Nebraska Agricultural Research Division.

Perrin, R.K., J. Poor, and D. Coyne. 2000.
Economic impact of the Chase variety of pinto bean. Research Bulletin 338. University of Nebraska Agricultural Research Division.

Ph.D. Dissertations

Cole, J.D. 2000.
An economic analysis of agricultural land leasing with an emphasis on the interface of leasing and conservation practices in Nebraska and South Dakota. (B.B. Johnson, Advisor)

Matthey, H. 2000.
Testing the impact of corporate farming restrictions on the Nebraska hog industry. (J.S. Royer, Advisor)

Suksamai, A. 2000.
International agricultural efficiency and productivity: A nonparametric malmquist index approach. (G.A. Helmers, Advisor)

Roeber, R.L. 2000.
A time series analysis of European wheat export refunds and world wheat prices. (E.W.F. Peterson, Advisor)

Agricultural Leadership, Education and Communication

Journal Articles

Barbuto, J.E. 2000.
Influence triggers: A framework for understanding follower compliance. Leadership Quarterly 11:365-387. (J. Series No. 2160)

Barbuto, J.E. 2000.
Comparing leaders' ratings to targets' self-reported resistance to task assignments: An extension of Chester Barnard's zones of indifference. Psychological Reports 86:611-621. (J. Series No. 12944)

Barbuto, J.E. and B. Plummer. 2000.
Mental boundaries and Jung's psychological types: A profile analysis. Journal of Psychological Type 54:17-21. (J. Series No. 12507)

Barbuto, J.E., S. Fritz, and D.B. Marx. 2000.
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Frantz, G.L. and J.W. King. 2000.
The distance education learning systems model (DEL). Education Technology 40: 41-45. (J. Series No. 12680)

King, J.W., G.C. Nugent, J.J. Eich, D.L. Mlinek, and E.B. Russell. 2000.
A policy framework for distance education: A case study and model. The Distance Education Online Symposium (DEOSNEWS). 10.10. (J. Series No. 12874) http://www.ed.psu.edu/acsde/deos/deosnews/deosnew10_10.asp

Fritz, S., J.E. Barbuto, D.B. Marx, A. Etling, and S. Burrow. 2000.
Motivation and recognition preferences of 4-H volunteers. Journal of Agricultural Education 41:40-49. (J. Series No. 12823)

Rockwell, S.K., J.W. Furgason, and D.B. Marx. 2000.
Research and evaluation needs for distance education: a delphi study. Online Journal of Distance Learning Administration. (J. Series No. 13083) http://www.westga.edu/~distance/jmain11.html

Rockwell, S.K., J. Schauer, S. Fritz, and D.B. Marx. 2000.
Faculty education, assistance and support needed to deliver education via distance. Online Journal of Distance Learning Administration. (J. Series No. 12965) http://www.westga.edu/~distance/jmain11.html

Refereed Proceedings

Barbuto, J.E. 2000.
What triggers compliance? A follower-based framework for understanding the influence process, p. 193-194. *In:* M. Wollan (ed.), Proceedings of the Institute for Behavioral and Applied Management, San Diego, CA.

Brown, L., J.E. Barbuto, M.S. Wilhite, and D.H. Wheeler. 2000.
A field study testing the relationship between employees' sources of motivation and their supervisors' ratings of their uses of organizational citizenship behaviors, p. 34-39. *In:* M.Wollan (ed.), Proceedings of the Institute for Behavioral and Applied Management, San Diego, CA.

Fritz, S., S. Burrow, A. Etling, and J.E. Barbuto. 2000. Motivation and recognition preferences of 4-H volunteers, p. 187-198. *In:* J. Harper (ed.), Proceedings of the Central States Agricultural Education Regional Research Conference, St. Louis, MO.

M.S. Theses

Brown, L.L. 2000. The relationship between employees' sources of motivation and their supervisors' ratings of their uses of organizational citizenship behaviors. (J.E. Barbuto, Advisor)

Agronomy and Horticulture

Journal Articles

Adams, D.C., M.K. Nielsen, W.H. Schacht, and R.T. Clark. 2000. Designing and conducting experiments for range beef cattle. Online Journal of Animal Science (J. Series No. 12760) http://www.asas.org/jas/0947.pdf

Al-Faraj, A., G.E. Meyer, G.R. Schade, and G.L. Horst. 2000. Dynamic analysis of moisture stress in tall fescue (*Festuca arundinacea*) using canopy temperature, irradiation, and vapor deficit. Transactions of the American Society of Agricultural Engineers 43:101-109. (J. Series No. 12526)

Al-Faraj, A., G.E. Meyer, and G.L. Horst. 2000. A crop water stress index for tall fescue (Festuca arundinacea Schreb.) irrigation decision-making — A traditional method. Computers and Electronics in Agriculture (Elsevier) 31:107-124. (J. Series No. 12949)

Arnaud-Santana, E., J.C. Nin, F. Saladin, G. Godoy-Lutz, D.P. Coyne, J.S. Beaver, and J.R. Steadman. 2000a. Registration of 'Arroyo Loro Negro' black bean. Crop Science 40:857-858. (J. Series No. 12669)

Arnaud-Santana, E., J.C. Nin, F. Saladin, G. Godoy-Lutz, D.P. Coyne, J.S. Beaver, and J.R. Steadman. 2000b. Registration of 'CIAS-95' red mottled bean. Crop Science 40:857. (J. Series No. 12666)

Arnaud-Santana, E., J.C. Nin, F. Saladin, G. Godoy-Lutz, J.S. Beaver, D.P. Coyne, and J.R. Steadman. 2000c. Registration of 'JB-178' red mottled bean. Crop Science 40:857-858. (J. Series No. 12668)

Baenziger, P.S., B. Moreno-Sevilla, C.J. Peterson, D.R. Shelton, R.W. Elmore, R.N. Klein, D.D. Baltensperger, L.A. Nelson, D.V. McVey, J.E. Watkins, and J.H. Hatchett. 2000. Registration of 'Culver' wheat. Crop Science 40:862-863. (J. Series No. 12612)

Beardslee, T.A., M.G. Zeece, G. Sarath, and J.P. Markwell. 2000. Soybean glycinin G1 acidic chain shares IgE epitopes with peanut allergen Ara h 3. International Archives of Allergy Immunology 123:299-307. (J. Series No. 13045)

Binder, D., D.H. Sander, and D.T. Walters. 2000. Maize response to time of nitrogen application as affected by level of nitrogen deficiency. Agriculture, Ecosystems and Environment 80:113-120. (J. Series No. 12548)

Browleit, R.C., W.H. Schacht, B.E. Anderson, and A.J. Smart. 2000. Forage removal and grazing time of cattle on small paddocks. Journal of Range Management 53:282-286. (J. Series No. 12311)

Campbell, B.T., P.S. Baenziger, A. Mitra, S. Sato, and T. Clemente. 2000. Inheritance of multiple transgenes in wheat. Crop Science 40:1133-1141. (J. Series No. 12806)

Cassada, D.A., Y. Zhang, D.D. Snow, and R.F. Spalding. 2000. Trace analysis of ethanol and MTBE in water using solid phase micro-extraction and gas chromatography/mass spectrometry. Analytical Chemistry 72:4654-4658. (J. Series No. 12979)

Coulibaly, A., M. Bagayoko, S. Traeore, and S.C. Mason. 2000. Crop residue management and cropping system influence on pearl millet and cowpea yield. African Crop Science Journal 8:1-8. (J. Series No. 12490)

Coyne, D.P., D.S. Nuland, D.T. Lindgren, J.R. Steadman, D.W. Smith, J. Gonzales, J. Schild, J. Reiser, L. Sutton, and C. Carlson. 2000. 'Weihing' Great Northern disease resistant dry bean. HortScience 35:310-312. (J. Series No. 12639)

Coyne, D.P., J.M. Reiser, D.A. Smith, A.L. Ibrahim, L. Sutton, and D.T. Lindgren. 2000. 'Butterbowl' squash, a novel, flat shouldered global butternut. HortScience 35:776-777. (J. Series No. 12638)

Danielson, S.D., J.R. Brandle, L. Hodges, and P. Sirnivas. 2000. Bean leaf beetle (*Coleoptera: Chrysomelidae*) abundance in soybean fields protected and unprotected by shelterbelts. Journal of Entomological Science 35:385-390. (J. Series No. 12711)

Dielman, J.A., D.A. Mortensen, D.D. Buhler, and R.B. Ferguson. 2000. Identifying associations among site properties and weed species abundance, II Hypothesis generation. Journal of Weed Science 48:576-587. (J. Series No. 12555).

Drijber, R.A., J.W. Doran, A.M. Parkhurst, and D.J. Lyon. 2000. Changes in soil microbial community structure with tillage under long-term wheat-fallow management. Soil Biology and Biochemistry 32:1419-1430. (J. Series No. 12934)

Eghball, B. 2000. Nitrogen mineralization from field-applied beef cattle feedlot manure or compost. Soil Science Society of America Journal 64:2024-2030. (J. Series No. 12863)

Eghball, B., J.E. Gilley, L.A. Kramer, and T.B. Moorman. 2000. Narrow grass hedge effects on phosphorus and nitrogen in runoff following manure and fertilizer application. Journal of Soil and Water Conservation 55:172-176. (J. Series No. 12712)

Eghball, B. and G.W. Lesoing. 2000. Viability of weed seeds following manure windrow composting. Compost Science and Utilization 8:46-53. (J. Series No. 12498)

Eskridge, K.M., M.M. Shah, P.S. Baenziger, and D.A. Travnicek. 2000. Correcting for classification errors when estimating the number of genes using recombinant inbred chromosome lines. Crop Science 40:398-403. (J. Series No. 12525)

Fei, S., P.E. Read, and T.P. Riordan. 2000. Improvement of embryogenic callus induction and shoot regeneration of buffalograss (*Buchlbe dactyloides* nutt. engelm) by AGN)3. Journal of Plant, Cell, Tissue and Organ Culture 60:197-203. (J. Series No. 13051)

Francis, C.A. 2000. Designing a durable and positive future for agriculture. American Journal of Alternative Agriculture 15:44-47. (J. Series No. 12625)

Francis, C.A. and H.C. Carter. 2000. Participatory education for sustainable agriculture: everyone a teacher, everyone a learner. Journal of Sustainable Agriculture 18:71-83. (J. Series. No. 12860)

Giesler, L.J., G.Y. Yuen, and G.L. Horst. 2000. Canopy microenvironments and applied bacteria population dynamics in shaded tall fescue. Crop Science 40:1325-1332. (J. Series No. 12773)

Gilley, J.E., B. Eghball, L.A. Kramer, and T.B. Moorman. 2000. Narrow grass hedge effects on runoff and soil loss. Journal of Soil and Water Conservation 55:910-196. (J. Series No. 12280)

Graef, G.L., L.L. Korte, and D.M. White. 2000. Registration of 'NE3399' soybean. Crop Science 40:575. (J. Series No. 12557)

Graef, G.L., D.M. White, and L.L. Korte. 2000. Registration of 'NE3297' soybean. Crop Science 40:575. (J. Series No. 12556)

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Hendrickson, J.R., L.E. Moser, and P.E. Reece. 2000. Tiller recruitment patterns and biennial tiller production in prairie sandreed. Journal of Range Management 53:537-543. (J. Series 12350)

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Johnson-Cicalese, J.M., P.G. Johnson, T.P. Riordan, F.P. Baxendale, R.E. Gaussoin, J.E. Watkins, and R.V. Klucas. 2000. Registration of '120' Buffalograss. Crop Science 40:571-572. (J. Series No. 12362)

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Invertase activity during tuberization *in vitro* as influenced by cytokinin-like compounds. American Journal of Potato Research 77:57-61. (J. Series No. 12226)

Kefi, S., A.D. Pavlista, P.E. Read, and S.D. Kachman. 2000.
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Northeast Research and Extension Center

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Panhandle Research and Extension Center

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Ph.D. Dissertation

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South Central Research and Extension Center

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ARD receives funding from federal formula funds, industry grants, federal grants and state appropriations. During fiscal year 2000-2001, faculty with ARD appointments obtained grant and contract funds that totaled $25,174,446. This amount represents 40 percent of all research grant and contract funds received by UNL. The extra-mural funds coming to ARD faculty to address problems of importance to Nebraska have a significant direct impact on the state's economy.

Report of Research Expenditures
The University of Nebraska
Agricultural Research Division

July 1, 2000 through June 30, 2001

Federal Formula Funds:	
Hatch Formula	$2,311,175
Regional Research	$ 890,340
McIntire-Stennis	$ 153,099
Animal Health	$ 148,580
Total Federal Formula Funds	$ 3,503,194
State Appropriated Funds	$27,466,538
Nebraska Research Initiative Funds	$ 2,279,052
Contracts and Grants:	
USDA Cooperative Agreements	$1,368,212
USDA Special and Competitive Grants	$4,218,652
Federal Grants - (NSF, NIH, USEPA, AID, DOE)	$5,814,899[1]
Industry Grants	$9,184,314
Total Grants and Contracts	$20,586,077
Product Sales	$ 9,913,842
Total Expenditures	$63,748,703

[1]$226,974 was included to show actual Agricultural Research Division expenditures reflecting transfers from International Programs.

Agricultural Research Division
Research Investments by Category and Funding Source FY 2001

Expenditure Category	*State Appropriated and Hatch Funds*	*Federal Grants*	*Industry Grants*	*Revolving Funds*	*All Funds*
	% of total within source				
Salaries, Wages and Benefits					
Faculty/Administrative	40.4	4.5	3.2	1.4	21.2
Managerial/Prof	13.7	6.1	6.7	5.7	9.8
Office/Service	11.3	4.8	9.8	14.4	10.3
Hourly Wages	0.7	2.6	4.0	2.8	1.9
GRA Stipends	5.5	16.3	14.7	2.0	8.5
Benefits	13.6	5.8	7.0	5.4	9.7
Subtotal:	85.2	40.2	45.3	31.7	61.5
Operating					
Supplies and Expenses	11.1	54.9	41.2	48.3	30.3
Travel	0.8	2.8	5.0	3.0	2.3
Equipment	2.9	2.1	8.4	17.0	6.0
Subtotal:	14.8	59.8	54.7	68.3	38.5
Total:	100.0	100.0	100.0	100.0	100.0

Agricultural Research Division
Selected Research Program Information

Category	FY 1999	FY 2000	FY 2001
Project Information:			
Projects at beginning of year	368	399	383
Projects terminating	23	42	25
Projects revised	11	6	14
New projects	54	26	37
Projects at the end of the year	399	383	395
Faculty full-time equivalents (FTE)	129.9	130.4	130.2
Expenditures for budgeted research faculty:			
Federal formula and state approp., $/FTE[1]	$258,582	$241,259	$255,367
Grant and contracts, $/FTE	$135,262	$138,217	$158,111
Product sales, $/FTE	$ 51,357	$ 52,774	$ 76,143
Outputs from research programs[2]:			
Refereed journal articles	274	327	275
Research bulletins	2	1	4
Books and book chapters	68	45	97
M.S. and Ph.D. theses	148	115	128
Cultivars and germplasm released	13	17	18
Patents obtained	3	6	2

[1]Includes cost of administration and expenditures from the Nebraska Research Initiative by ARD-affiliated faculty.
[2]A large number of abstracts, technical reports, and other non-refereed articles also are published by faculty each year.

"Science knows no country because knowledge belongs to humanity and is the torch which illuminates the world. Science is the highest personification of the nation because that nation will remain the first which carries the furthest the works of thought and intelligence."

– Louis Pasteur

University of Nebraska Lincoln