Agricultural Research Division Annual Report 2001

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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.

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To simplify technical terminology, trade names of products or equipment sometimes are used. No endorsement of products is intended nor is criticism implied of products not mentioned.

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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.
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.

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.
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.

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.

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 Sandhills’ 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 habit 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.
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 predominantly 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.

**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.

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.

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.

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 didn’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 screened 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 identification. 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.
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.

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.

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.

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 Psi 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.

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 re-appointed 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 (Metallo-biochemistry) 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.

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.

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.

Stephen 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.”
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 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. |
| **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 Linnaen Team, which was Runner-up at the North Central Branch Entomological Society of America meetings. |
| **Tom Eckhoff** | 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. |
| **Biochemistry** | Horatiu Oltean 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 Othern 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. |
| **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 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. |
| **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 Bakey 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. Zateckha 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.
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.

<table>
<thead>
<tr>
<th>Agricultural Economics</th>
<th>Biochemistry</th>
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<tbody>
<tr>
<td>Jessica Harrison received an Honors Award for “An Analysis of Nebraska’s Rural Development” from the Agricultural Research Division. (R. Perrin, Advisor)</td>
<td>Erick Kinyungu received an Honors Award for “Molecular Basis of Rubisco Transcription” from the Agricultural Research Division. (R. Spreitzer, Advisor)</td>
</tr>
<tr>
<td>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)</td>
<td>Brett Meyer received an Honors Award for “CLA, Body Fat, and Apoptosis” from the Agricultural Research Division. (R. Klucas and J.L. Miner, Advisors)</td>
</tr>
<tr>
<td>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)</td>
<td>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)</td>
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<tr>
<th>Agricultural Leadership, Education and Communication</th>
<th>Biological Systems Engineering</th>
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</thead>
<tbody>
<tr>
<td>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)</td>
<td>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)</td>
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<tr>
<th>Animal Science</th>
<th>Entomology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jamie W. Poskochil received an Honors Award for “Fine Mapping of jrc Cataract Mutation in Mice” from the Agricultural Research Division. (M. Nielsen, Advisor)</td>
<td>Paul Nabity received an Honors Award for “Calliphoridae Larval Development Responses to Temperature Variances” from the Agricultural Research Division. (L. Higley, Advisor)</td>
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<tr>
<th>Veterinary and Biomedical Sciences</th>
<th>Plant Pathology</th>
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<tbody>
<tr>
<td>Nathan Erdmann received an Honors Award for “Identification and Manipulation of Legionella pneumophila Genes Actively Involved in Entry” from the Agricultural Research Division. (J. Cirillo, Advisor)</td>
<td>Chad Zimmerman received an Honors Award for “Chemical Phophylaxis for Control of GrayLeaf Spot on Corn” from the Agricultural Research Division. (J. Partridge, Advisor)</td>
</tr>
<tr>
<td>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)</td>
<td></td>
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<tr>
<th>Water Center</th>
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<tbody>
<tr>
<td>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)</td>
</tr>
</tbody>
</table>
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.

### Variety and Germplasm Releases

**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 A1 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 F2 to F6 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 A1 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 F2 to between F7 and F12 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 A₁ cms system (milo cytoplasm). These germplasms were selected in Nebraska from segregating S₃ and S₄ 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 F₄ to F₆ 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:

### Characteristics:
These early maturing grain sorghum R-lines germplasms restore male fertility in the A₁ 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.

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

**Variety Name:** Millennium


**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 wide, 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 dry-land 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 Millennium should be acceptable to the milling and baking industries.

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

**Variety Name:** Cougar


**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, midsized 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:**

**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-

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**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.

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

**Variety:** ‘CIA-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

**Characteristics:** CIA-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. CIA-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 CIA-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

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

Variety:  
‘JB-178’ red mottled bean

Scientists:  

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:  

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.
Copyright 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

<table>
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<td>Scientists</td>
<td>J.D. Cirillo</td>
</tr>
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<td>Description</td>
<td>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.</td>
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<th>Patent Title</th>
<th>Nucleotide Sequences and Method for Detection of Serpulina hyodysenteriae</th>
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<tr>
<td>Patent Numbers</td>
<td>American Type Culture Collection Deposit No. 75826; United States Patents</td>
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<td>Scientists</td>
<td>G.E. Duhamel and R.O. Elder</td>
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<td>Description</td>
<td>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.</td>
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</table>
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          | Drew Miller, Papillion          |
| Randolph Ferlic, Omaha       | Nancy O'Brien, Waterloo         |
| Chuck Hassebrook, Walthill   | Kent Schroeder, Kearney         |
| Jay Matzke, Seward           | 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 McCain¹, Temporary/On Call

¹Temporary appointment
Organizational Chart

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

Harlan Vice Chancellor
John C. Owens

Associate Vice Chancellor
Edna L. McBreen

Assistant Vice Chancellor
Finance and Personnel
Alan R. Moeller

Dean
Agricultural Research Division
Darrell W. Nelson*

Interim Dean
College of Agricultural Sciences and Natural Resources
Steve Waller

Dean
College of Human Resources and Family Sciences (IANR Research and Extension)
Marjorie J. Kostelnik

Dean
Cooperative Extension Division
Elbert Dickey**

Director
Conservation and Survey Division
Mark S. Kuzila

Director
International Programs
Arlen Etling

*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

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
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
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

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### Agricultural Leadership, Education and Communication

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\(^1\) Ended research appointment during 2000-2001
\(^2\) Began research appointment during 2000-2001
## Agronomy and Horticulture

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### Biological Systems Engineering

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<td>Agricultural Economics (Farm Management)</td>
</tr>
<tr>
<td>James Stack</td>
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<td>Plant Pathology (Diseases)</td>
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<td>Randy Cantrell</td>
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<td>0.05</td>
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<td>Gary W. Hergert</td>
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<td>Richard T. Clark</td>
<td>Professor</td>
<td>0.43</td>
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<td>Interim Associate Director, Agricultural Economics (Farm and Ranch Management)</td>
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<tr>
<td>West Central Research and Extension Center</td>
<td>Don C. Adams</td>
<td>Professor</td>
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<td>Animal Science (Range Cattle Nutrition)</td>
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<td>John B. Campbell</td>
<td>Professor</td>
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<td>Entomology (Livestock/Crops)</td>
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<td>Gene H. Deutscher</td>
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<td>Animal Science (Beef Cattle Reproduction)</td>
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<td>Steve Ensley</td>
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<td>Veterinary and Biomedical Sciences (Veterinary Toxicology and Diagnostic)</td>
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<tr>
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<td>Dale T. Lindgren</td>
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<td>Horticulture (Ornamentals)</td>
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<td>Nancy Norton</td>
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<td>Agricultural Economics (Farm/Ranch Management)</td>
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<tr>
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<td>José Payero</td>
<td>Assistant Professor</td>
<td>0.50</td>
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<td>Biological Systems Engineering (Irrigation and Evapo Transporation)</td>
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<td>Jerry Volesky</td>
<td>Assistant Professor</td>
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<td>Agronomy/Horticulture (Range Management)</td>
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<tr>
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<td>Gail A. Wicks</td>
<td>Professor</td>
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<td>Agronomy/Horticulture (Ecofarming/Weeds)</td>
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<td><strong>Interdisciplinary Activities</strong></td>
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<td>Water Center/Environmental Programs</td>
<td>Edward F. Vitzthum</td>
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<td>Shripat T. Kamble</td>
<td>Professor</td>
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<tr>
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<td>Robert D. Kuzelka</td>
<td>Associate Professor</td>
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<tr>
<td>Water Center/Environmental Programs</td>
<td>Roy F. Spalding</td>
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<tr>
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<td>Darrell W. Nelson</td>
<td>Professor</td>
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</tr>
<tr>
<td>Agricultural Research Division</td>
<td>Dale H. Vanderholm</td>
<td>Professor</td>
<td>0.75</td>
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<td>Associate Dean and Director</td>
</tr>
<tr>
<td>Agricultural Research Division</td>
<td>Marjorie J. Kostelnik</td>
<td>Professor</td>
<td>0.12</td>
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<tr>
<td>Agricultural Research Division</td>
<td>Steven S. Waller</td>
<td>Professor</td>
<td>0.50</td>
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<td>Assistant Dean and Director; NCSARE Coordinator</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Visiting Scientist</th>
<th>Country</th>
<th>Expertise/Discipline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Galal El-Sherbeny</td>
<td>Egypt</td>
<td>Crosses in wheat breeding</td>
</tr>
<tr>
<td>Mahnaz Jabeen</td>
<td>Pakistan</td>
<td>Wheat breeding and genetics</td>
</tr>
<tr>
<td>Ariovaldo Luchiari Jr.</td>
<td>Brazil</td>
<td>Precision agriculture, crop stress detection, and remote sensing</td>
</tr>
<tr>
<td>Michael Mogorosi</td>
<td>Botswana</td>
<td>Practical training in Pearl Millet Breeding — sponsorship with INTSORMIL</td>
</tr>
<tr>
<td>Sebahaattin Ozcan</td>
<td>Turkey</td>
<td>mRNA display techniques and molecular marker techniques</td>
</tr>
<tr>
<td>Zhang Rui</td>
<td>P.R. China</td>
<td>Nitrogen-use efficiency</td>
</tr>
<tr>
<td>Christos Tsadilas</td>
<td>Greece</td>
<td>Influence of municipal wastes application on soil quality</td>
</tr>
<tr>
<td>Mario Urbani</td>
<td>Argentina</td>
<td>Breeding sexual perennial grasses for improved nutritive value for cattle</td>
</tr>
<tr>
<td>Ye Xingguo</td>
<td>China</td>
<td>Wheat tissue culture and transformation research</td>
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#### Animal Science

<table>
<thead>
<tr>
<th>Visiting Scientist</th>
<th>Country</th>
<th>Expertise/Discipline</th>
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<tbody>
<tr>
<td>Arianna Bolla</td>
<td>Italy</td>
<td>Animal genetics</td>
</tr>
<tr>
<td>Clendro Diaz</td>
<td>Brazil</td>
<td>Swine reproduction</td>
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<tr>
<td>Manuel Gomez Gill</td>
<td>Venezuela</td>
<td>Animal genetics</td>
</tr>
<tr>
<td>Joao Luis Lopes da Costa Rocha</td>
<td>United States/Texas</td>
<td>Animal genetics</td>
</tr>
<tr>
<td>Ji-Woong Lee</td>
<td>Korea</td>
<td>Animal genetics</td>
</tr>
<tr>
<td>Xuehong Liu</td>
<td>China</td>
<td>Animal genetics</td>
</tr>
<tr>
<td>Namburi Singari</td>
<td>India</td>
<td>Ruminant nutrition</td>
</tr>
<tr>
<td>Gary Snowder</td>
<td>United States/Idaho</td>
<td>Animal genetics</td>
</tr>
<tr>
<td>Panwadee Sopannarath</td>
<td>Thailand</td>
<td>Animal genetics</td>
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#### Biochemistry

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<tr>
<th>Visiting Scientist</th>
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<tbody>
<tr>
<td>Fazoil Ataullakhanov</td>
<td>Russia</td>
<td>Biophysics and computational biology</td>
</tr>
<tr>
<td>Chris Chastain</td>
<td>United States/Minnesota</td>
<td>Animal genetics</td>
</tr>
<tr>
<td>Plant molecular biology and biochemistry</td>
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### Visiting Scientists

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<tr>
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<th>Expertise/Discipline</th>
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<tbody>
<tr>
<td>Gloria Esquivel</td>
<td>Portugal</td>
<td>Biochemistry</td>
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<tr>
<td>Loli Galvez</td>
<td>Spain</td>
<td>Plant physiology and biochemistry</td>
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<tr>
<td>Piotr Paneth</td>
<td>Poland</td>
<td>Isotope fractionation studies in chemistry and biochemistry</td>
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<tr>
<td>A. Raman</td>
<td>Australia</td>
<td>Application of isotope ratio mass spectrometry in plant-insect interaction studies</td>
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<tr>
<td>Valerie Terwilliger</td>
<td>United States/Kansas</td>
<td>Isotope ratio mass spectrometry in geological and ecological studies</td>
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<tr>
<td>Victor Vitvitsky</td>
<td>Russia</td>
<td>Metabolic biochemistry</td>
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<tr>
<td>Barbara Vokel</td>
<td>Slovenia</td>
<td>Isotope fractionation studies in chemistry and geology</td>
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### Entomology

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<tbody>
<tr>
<td>Mahmoud Ali</td>
<td>Egypt</td>
<td>Apiculture</td>
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<tr>
<td>Kemal Buyukguzel</td>
<td>Turkey</td>
<td>Insect physiology</td>
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<tr>
<td>Juan Cibrian</td>
<td>Mexico</td>
<td>Insect physiology</td>
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<td>Samira S. El Shall</td>
<td>Egypt</td>
<td>Radiation sterility</td>
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<td>Jaime Molina-Ochoa</td>
<td>Mexico</td>
<td>Insect physiology</td>
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<td>Youngjin Park</td>
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### Plant Pathology

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<tr>
<td>José Waquil</td>
<td>Brazil</td>
<td>Host plant resistance, integrated pest management</td>
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<tr>
<td>Mario Mehmel</td>
<td>Germany</td>
<td>Potassium ion channel specialist</td>
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<tr>
<td>Graciela Godoy-Lutze</td>
<td>Dominican Republic</td>
<td>Disease management</td>
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<tr>
<td>Frank Rabenstein</td>
<td>Germany</td>
<td>Plant virology</td>
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<td>Jefferson Costa</td>
<td>Brazil</td>
<td>Bean disease management</td>
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### School of Natural Resource Sciences

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<tbody>
<tr>
<td>Robert Jefferies</td>
<td>Canada</td>
<td>Ecosystem ecology</td>
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<tr>
<td>Clarence Lehman</td>
<td>United States/Minnesota</td>
<td>Theoretical ecology</td>
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<td>Stamatis Stamatiadis</td>
<td>Greece</td>
<td>Denitrification and laboratory management</td>
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<td>Jae Yang</td>
<td>South Korea</td>
<td>Soil chemistry</td>
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### Veterinary and Biomedical Sciences

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<tr>
<td>Seetharaman Gopinath</td>
<td>India</td>
<td>Molecular biology/virology</td>
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<td>Reginaldo Bastos</td>
<td>Brazil</td>
<td>Molecular biology</td>
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<tr>
<td>Li-Mei Chen</td>
<td>Taiwan</td>
<td>Bacteria pathogenesis</td>
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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: Buffalo grass 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: 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
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<th>Research Associate</th>
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<tr>
<td>Natalia V. Ermolova</td>
<td>Russia</td>
<td>Plant Biochemistry</td>
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<tr>
<td>Nisso Fazliddinova</td>
<td>Russia</td>
<td>Organic chemistry</td>
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<td>Olga Komina</td>
<td>Russia</td>
<td>Plant biochemistry</td>
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<tr>
<td>Boris Kornilaev</td>
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<tr>
<td>Julya Krasotkina</td>
<td>Russia</td>
<td>Enzymology</td>
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<td>Tapan Kundu</td>
<td>India</td>
<td>EPR spectroscopy</td>
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<td>Weihua Li</td>
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<td>Biochemistry</td>
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<td>Eugene Mosharov</td>
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<td>Devendra Naidu</td>
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<td>Bacteriology</td>
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<td>Youbin Xiang</td>
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<td>Wexin Xu</td>
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<td>Irrigation management</td>
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<td>Ki Myong Kim</td>
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<tr>
<td>Keum Hwang</td>
<td>Choubuk/Korea</td>
<td>Lipid chemistry, food processing</td>
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<tr>
<td>Samira A. El Shall</td>
<td>Egypt</td>
<td>Radiation sterility</td>
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<td>Srinivas Parimi</td>
<td>India</td>
<td>Insecticide toxicology</td>
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<tr>
<td>Dr. Angela Alleyne</td>
<td>Barbados/West Indies</td>
<td>Plant pathology – pathogen variability</td>
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<tr>
<td>Dr. Shao-rong Chen, Ph.D.</td>
<td>China</td>
<td>Plant molecular genetics</td>
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<tr>
<td>Dr. Ming Guo</td>
<td>China</td>
<td>Bacterial genetics and plant biology</td>
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<tr>
<td>Dr. Kempton Horken</td>
<td>Ohio/USA</td>
<td>Biochemistry</td>
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<tr>
<td>Dr. Zarir Vaghchipawala</td>
<td>India</td>
<td>Plant genetics</td>
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<tr>
<td>Tala Awada</td>
<td>Canada</td>
<td>Plant water stress</td>
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</table>
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

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

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
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
- Hatch
- Regional Research
- State
- McIntire-Stennis
- Special Grant
- Competitive Grant
- Animal Health

### Funding Source
- Hatch: Federal and State Funds
- Regional Research: Federal Funds
- State: Federal Funds
- McIntire-Stennis: Federal Funds
- Special Grant: Federal, State, Public and Private Funds
- Competitive Grant: Federal Funds/USDA
- Animal Health: Federal Funds

### Code
- Hatch: ha
- Regional Research: rr
- State: st
- McIntire-Stennis: ms
- Special Grant: sg
- Competitive Grant: cg
- Animal Health: 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** eg 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. Azam, J.C. Allen)
10-142 rr
Competitiveness and value added in the U.S. grain and oilseed industry
(D. Conley)
10-143 eg
People, place and policy in the new millennium (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 agrochemicals 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 range-land vegetation (J. Stubbendiek)
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 eg
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 eg
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 eg
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 eg
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)
Animal Science

12-306 rr Management systems for improved decision making and profitability of dairy herds (R.J. Grant, H.D. Jose)
12-305 rr Biophysical models for poultry production systems (M.M. Beck)
12-306 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)
*13-122 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 gondadotropins (H.E. Grotjan)
*13-136 cg Synthesis and assembly of cellulase binding proteins by Ruminococcus albus (M. Morrison)
13-137 cg Recombinant bovine gondadotropins (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 gondadotropin 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. Kikut)
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 (R. Chollet, J.P. Markwell)
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 B12 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 CO2 fixation and bioremediation (S. Ragdale)
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 methylene 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. Doskey, 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. Paparozi)

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 (R.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. Hultkins)

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 myofibrillar/ 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 eg
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. Cappet)

*16-079 st
Mapping and site-directed mutagenesis 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 eg
Genomic analysis of E. coli O157:H7 populations from cattle and humans (A.K. Benson, R.W. Hultkins)

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 eg
Extirpation 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. Hultkins)
### Horticulture

**20-040**  
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**  
Influence of sulfur and nitrogen on the growth and development of ornamental plants (E.T. Paparozzi)

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

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

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

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

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

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

**20-060**  
Breeding and development of buffalo grass for the central Great Plains (T.P. Riordan)

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

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

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

### Plant Pathology

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

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

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

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

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

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

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

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

**21-064**  
Fusarium mycoxins in cereal grains (M.B. Dickman)

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

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

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

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

**21-073**  
Environmental effects on plant host-parasite interactions (E.J. Peters)

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

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

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

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

**21-079**  
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**  
Processes associated with long-term fate and detoxification of organonitrogen contaminants in soil (P.J. Shea)

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

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

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

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

**27-005**  
Ecology of pallid sturgeon and associated fishes in the Platte River, Nebraska (E.J. Peters)

**27-006**  
Linking special forest products, markets and sustainable agroforestry systems (S.J. Josiah, J.R. Brandle)

**27-007**  
Consequences of woody species establishment in the Great Plains (D. Wedin)

**27-008**  
Interrannual and interdecadal variation of precipitation and temperature in Nebraska and surrounding states (Qi “Steve” Hu)

**27-009**  
Climate and agricultural landscape productivity analysis and assessment in the North Central Region (K.G. Hubbard)

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

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

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

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

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

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

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

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

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

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

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Consequences of woody species establishment in the Great Plains (D. Wedin)

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Interannual and interdecadal variation of precipitation and temperature in Nebraska and surrounding states (Qi “Steve” Hu)

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

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

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

**40-013**  
Rapid estimation of soil hydraulic properties (J. Skopp)
Veterinary and Biomedical Sciences

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

14-014  
Bovine respiratory disease (S. Srikumaran)

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

14-104  
Identification of mycobacterium paratuberculosis virulence determinants (R.G. Barletta)

14-105  
The effect of PRRSV on the immune system during acute and persistent infection (F.A. Osorio, F. Zuckerman, A.R. Doster)

14-107  
Theoretical and applied molecular biology or porcine gonadotropins (G.B. Shearman)

14-108  
Molecular genetic analysis of Mycobacterium paratuberculosis and related mycobacterial pathogens (R.G. Barletta)

14-109  
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. Klopofstein)

14-110  
Inhibition of apoptosis by the bovine herpes virus I latency related gene (C. Jones, A. Doster)

14-111  
A novel strategy to test and monitor feedlot food-safety control points (D. Smith, L. Hungerford, J. Gray, R. Moxley, T. Klopofstein)

14-112  
GP 96 as molecular chaperone for antigen delivery in viral systems (S. Srikumaran)

14-113  
A workshop on epidemiologic methods and approaches to food safety (R. Wills)

14-114  
Role of macrophages in the pathogenesis of porcine colonic spirocheiosis (G. Duhamel, J. Girillo)

14-115  
Porcine reproductive and respiratory syndrome (PRRRS) (F.A. Osorio, R. Wills)

14-116  
Geospatial analysis and animal health (L. Hungerford)

Human Resources and Family Sciences Departments

Family and Consumer Sciences

*92-020  
The role of housing in rural community vitality (E.R. Combs)

92-021  
Impact of Head Start on rural children, families, and communities (P.D. Zeece)

92-022  
Retirement economic well-being for women in Nebraska and cross-culturally (S.L. Cramer)

92-023  
Economic well-being of Nebraska household: a comparison of alternative measures (E.P. Davis)

*92-025  
Family functioning of interracially constituted families (S. Baughler)

92-026  
Surviving and transcending a traumatic childhood (J. DeFrain)

92-028  
High hopes and bright futures: successful teens in Nebraska (D.A. Abbott, W.H. Meredith)

*92-029  
The impact of welfare reform on women’s lives: education, job placement/retention, and resource management (K. Prochaska-Cue, B. Sparks)

Nutritional Science and Dietetics

91-042  
Bioavailability of nutrients: a key to human nutrition (J.A. Driskell)

91-043  
Health maintenance aspects of dietary recommendations designed to modify lipid metabolism (N.M. Lewis)

91-045  
Using stages of change model to promote consumption of grains, vegetables and fruits by young adults (N.M. Betts)

91-046  
Exercise dependence and disordered eating behaviors: instrument development and validation of mental health treatment within a primary care medical setting (R.J. Bischoff)
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)

Panhandle Research and Extension Center

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)
42-023 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. Knezovic)
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)

West Central Research and Extension Center

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. Rooth)
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)

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)
Genotype by environment interactions for sow productivity and early piglet growth (T.E. Long)

Grazing management strategies and systems for Sandhills meadows (J.D. Volesky)

Integrated weed management in reduced tillage systems in low rainfall environments (G.A. Wicks)

Selection, development and propagation of native herbaceous landscape plants (D.T. Lindgren)

Economic and nitrate leaching implications of water conservation in Nebraska irrigated agriculture (N.A. Norton, R.T. Clark)

Improving fertilizer management and recommendations for precision agriculture (G.W. Hergert)

General administration of federal fund research (D.W. Nelson)

Regional research coordination, North Central Region (D.W. Nelson)

Center for sustainable agricultural systems (C.A. Francis)

Integrated crop/livestock research for sustainable systems (C.A. Francis, T.J. Klopfenstein, J.R. Brandle)

Integrated crop/livestock/agroforestry research for sustainable systems in Nebraska (T.J. Klopfenstein, J.R. Brandle, C.A. Francis)

Field laboratory development (D. Duncan)

Development and evaluation of food products, processes and markets (S.L. Taylor)

Midwest food manufacturing alliance (S.L. Taylor)

Development and quality/safety enhancement of specialty food products (S. Taylor)

Midwest advanced food manufacturing alliance (S.L. Taylor)

Development and quality/safety enhancement of specialty food products (S. Taylor)

Alliance for food protection (S. Hefle)

Industrial agricultural products center (M.A. Hanna)

Biodegradable plastics from corn starch and soybean oil (M.A. Hanna, V. Miladinov)

Industrial Agricultural Products Center (M.A. Hanna)
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
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<th>Plant and Soil</th>
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<td>Transactions of the American Society of Agricultural Engineers</td>
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<td>Food Science Biotechnology</td>
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<td>Animal Feed Science and Technology</td>
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<td>Asian-Australian Journal of Animal Science</td>
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<td>Florida Entomologist</td>
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### 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

### 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

### 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

### Textiles, Clothing and Design
- Applied Engineering in Agriculture
- Journal of Family and Consumer Sciences
- Starch/Starke
- Textile Chemist and Colorist and American Dyestuff Reporter

### 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

### Veterinary and Biomedical Sciences
- 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

Agricultural/ Natural Resources Units

Agricultural Economics

Journal Articles

Predicting community satisfaction among rural residents: An integrative model. Rural Sociology 65:72-86. (J. Series No. 12451)

The economics of coupled farm subsidies under costly and imperfect enforcement. Agricultural Economics 22:75-90. (J. Series No. 13328)

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)

Refereed Proceedings


Book Chapter

Economic opportunities for new genetic products, chapter 2. In: Designing Crops for Added Value, Agronomy Monograph. ASA, CSSA and SSSA, Madison, WI.

Research Bulletins

University of Nebraska Agricultural Research Division.


Ph.D. Dissertations

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)

Testing the impact of corporate farming restrictions on the Nebraska hog industry. (J.S. Royer, Advisor)

International agricultural efficiency and productivity: A nonparametric malmquist index approach. (G.A. Helmers, Advisor)

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


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)

Mental boundaries and Jung’s psychological types: A profile analysis. Journal of Psychological Type 54:17-21. (J. Series No. 12507)

A field study of two measures of work motivation for predicting leader’s transformational behaviors. Psychological Reports 86:295-300. (J. Series No. 12907)

Refereed Proceedings


Motivation and recognition preferences of 4-H volunteers,

M.S. Theses
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


Refereed Proceedings


Books


Research Bulletin


**M.S. Theses**

Artikov, I.S. 2000. Maize hybrids and growth stage effects on leaf nitrogen status and the prediction of N sufficiency using the SPAD 502 chlorophyll meter. (D.T. Walters, Advisor)

Bahadir, M.A. 2000. Changes in phosphorus status during the fallow year of soils cropped to wheat. (D.L. McCallister, Advisor)


Callan, A.P. 2000. Grazing date by stocking rate effects on prairie sandreed. (P.E. Reece and W.H. Schacht, Advisors)


Renken, R.R. 2000. Retardation of potassium in porous media as influenced by velocity. (J.M. Skopp, Advisor)


Tichota, G.R. 2000. The germination, propagation, and establishment of Carex filifolia (Threadleaf Sedge). (J. Stubbendieck, Advisor)


**Ph.D. Dissertations**

Abeyo, B.G. 2000. Temperature, planting depth, and genotype effects on seedling characteristics and seeding rate effects on agronomic and quality performance of winter wheat (Triticum aestivum L.). (P.S. Baenziger, Advisor)

Coelho, A.M. 2000. Irrigated corn yield as related to spatial variability of selected soil properties in silty clay loam and sandy soils. (J.W. Doran and D.G. Watts, Advisors)

Echavarria-Chaizere, F.G. 2000. Alternate irrigation and fertilization to reduce leaching of nitrates. (C.A. Shapiro and D.T. Walters, Advisors)


**Animal Science**

**Journal Articles**


Book


Book Chapter


Research Bulletin


M.S. Theses


Canbury, J.L. 2000. Strategy for the conservation of non-game birds in the state of Nebraska. (M.M. Beck, Advisor)


Davis, T.L. 2000. Endocrine regulation to enhance luteal function in cattle. (J.E. Kinder, Advisor)

DeGroot, B.J. 2000. Divergent selection for predicted transmitting ability for type in Holsteins: Genetic parameters and response of linear type, yield traits, and somatic cell scores through four generations. (J.F. Keown, Advisor)


Folmer, J.D. 2000. Utilization of Bt corn residue for grazing beef steers and Bt corn silage for growing beef steers and lactating dairy cattle. (C.T. Milton and T.J. Klopfenstein, Advisors)


McDanelD, T.G. 2000. The role of uncoupling proteins on maintenance energy in mice divergently selected for heat loss. (M.K. Nielsen and J.L. Miner, Advisors)

McEvar, M.E. 2000. Pressure cooked bacon manufactured by microwave and double belt conveyor cooking systems. (R.W. Mandigo, Advisor)

Mussard, M.L. 2000. Regulation of FSH synthesis and control of ovarian follicular development in cattle. (J.E. Kinder, Advisor)


Ph.D. Dissertations


Cooper, R.J. 2000. Effect of corn processing on the degradable intake protein requirements of finishing cattle. (T.J. Klopfenstein, Advisor)

Ermer, P.M. 2000. Behavioral and metabolic changes associated with the addition of tallow to the diet of lactating sows. (P.S. Miller and A.J. Lewis, Advisors)


Patterson, Hubert H., III. 2000. Protein supplementation to pregnant heifers and grazing management effects on cow diet quality. (D.C. Adams and T.J. Klopfenstein, Advisors)


Scott, T.L. 2000. Utilization of feed resources to enhance efficiency of feedlot cattle. (T.J. Klopfenstein, Advisor)
Biochemistry

Journal Articles


Book


Biometry

Journal Articles

A field study of two measures of work motivation for predicting leader’s transformational behaviors. Psychological Reports 86:295-300. (J. Series No. 12807)

Influence of corn phenology on adult western corn rootworm (Coleoptera: Chrysomelidae) distribution. Environmental Entomology 29:587-595. (J. Series No. 12596)

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)

Correlations between burrowing owl and black-tailed prairie dog declines: a 7-year analysis. Wildlife Society Bulletin 24:1067-1075. (J. Series No. 11827)

Biometry (J. Series No. 12790)


Performance tests of three-point mounted implement guidance systems: II-Results 16:605-661. (J. Series No. 12792)

Fractional composition of grain sorghum (Sorghum bicolor) after wet-peeling in a centrifugal pump. Applied Engineering in Agriculture 16:253-258. (J. Series No. 12466)


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

Plant community patterns on upland prairie in the eastern Nebraska Sandhills. The Prairie Nature 32:43-45. (J. Series No. 13089)

Using nonlinear growth curves to estimate heat stress in processing feed-lot cattle. Proceedings of 12th KSU Conference on Applied Statistics in Agriculture, Manhattan, KS.

Biological Systems Engineering

Journal Articles

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)


Narrow grass hedge effects on runoff and soil loss. Journal of Soil and Water Conservation 55:910-196. (J. Series No. 12280)

Fuzzy composite programming to combine remote sensing and crop models for decision support in precision crop management. Agricultural Systems 65:137-138. (J. Series No. 12846)


A combination of iontophoresis and the chelating agent 1,10-phenan-throline act synergistically as penetration enhancers. Pharmaceutical Science 2:35. (J. Series No. 13068)

A novel system to study the impact of epithelial barriers on cellular metabolism. Annals of Biomedical Engineering 28:1210-1217. (J. Series No. 13084)

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)

Neural network modeling of energy requirement for size reduction of wheat. Transactions of the American Society of Agricultural Engineers 43:947-952. (J. Series No. 12702)

Referred Proceedings

Assessing refinements in modeling sinusoidal conditions used to drive cattle body temperatures, American Statistical Association, Indianapolis, IN.


**Refereed Proceedings**


**Book Chapters**


**Ph.D. Dissertations**

Arumi, J.L. 2000. Modeling the effects of agricultural management practices on ground water quality and quantity. (D.L. Martin and D.G. Watts, Advisors)


Merino, G.G. 2000. Including conflict criteria and ambiguous information in the design of a grid-connected photovoltaic-wind generator power system supplying a farmstead in Nebraska. (D.D. Jones, Advisor)

**Entomology**

**Journal Articles**


**Book Chapter**

M.S. Theses

Toxicity, electrophysiology, and metabolism of fipronil and its oxidative sulfone metabolite in European corn borer larvae, Ostrinia nubilalis (Hübner) (Lepidoptera: Crambidae). (B.D. Siegfried, Advisor)

Temperature dependent mortality and development of immature European corn borer, Ostrinia nubilalis (Hübner). (J.E. Foster, Advisor)

Clark, T.L. 2000.
The effect of dietary protein level and population density on adults of the primary screwworm (Diptera: Calliphoridae) reared at different temperatures. (D.R. Berkebile and J.E. Foster, Advisors)

High pressure liquid injection: a novel approach for managing turfgrass insect pests. (F.P. Baxendale, Advisor)

Ph.D. Dissertations

Clark, T.L. 2000.
Marker based diagnosis, molecular phylogenetics and discovery of population altering endosymbionts for selected Diabroticetes (Coleoptera: Chrysomelidae). (J.E. Foster and L.J. Meinke, Advisors)

Villatoro, K.E. 2000.
Revision of the genus Trizogeniates (Calliphoridae) reared at different temperatures. (D.R. Berkebile and J.E. Foster, Advisors)

Analysis of resistant varieties with differing levels of resistance to the primary screwworm (Diptera: Calliphoridae) reared at different temperatures. (J.E. Foster and S.S. Quisenberry, Advisors)

Induced resistance to bean leaf beetle in soybean. (S.D. Danielson, Advisor)

Induced resistance to bean leaf beetle in soybean. (S.D. Danielson, Advisor)

The effect of dietary protein level and population density on adults of the primary screwworm (Diptera: Calliphoridae) reared at different temperatures. (D.R. Berkebile and J.E. Foster, Advisors)

Temperature dependent mortality and development of immature European corn borer, Ostrinia nubilalis (Hübner). (J.E. Foster, Advisor)

Food Science and Technology

Journal Articles

Soybean glycinin A1a shares IgE epitopes with peanut allergen Ara h 3. International Archives of Allergy and Immunology 123:299-307. (J. Series No. 13045)

The role of FB in adaptation of Listeria monocytogenes to growth at low temperature. Journal of Bacteriology 182:7083-7087. (J. Series No. 13140)

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Occurrence of fumonins and moniliformin in corn and corn based food products of U.S. origin. Journal of Food Protection 63:1732-1737. (J. Series No. 12920)

A sandwich enzyme-linked immunosorbent assay for the detection of almonds in foods. Journal of Food Protection 63:252-257. (J. Series No. 12624)

Fermentation of fructose-3,6-dicarboxylic acid by lactic acid bacteria. Applied and Environmental Microbiology 66:2682-2684. (J. Series No. 12877)

2S Methionine-rich protein (SSA) from sunflower seed is an IgE-binding protein. Allergy 55:556-559. (J. Series No. 12741)

Identification of sunflower-seed IgE-binding proteins. International Archives of Allergy and Immunology 121:19-24. (J. Series No. 12701)

Fractionation of grain sorghum using abrasive decortication. Journal of Agricultural Engineering Research 77:203-208. (J. Series No. 12171)

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Dry matter loss during nixtamalization of a white corn hybrid: Impact of processing parameters. Cereal Chemistry 77:254-258. (J. Series No. 12523)

Comparison of esterase between insecticide resistant and susceptible strains of German cockroach, Blattella germanica (L.) (Dictyoptera: Blattellidae). (S.T. Kamble, Advisor)

Genetic variation of the European corn borer (Ostrinia nubilalis) (Hübner) (Lepidoptera: Crambidae). (J.E. Foster and S.S. Quisenberry, Advisors)

Fermentation of fructose-3,6-dicarboxylic acid by lactic acid bacteria. Applied and Environmental Microbiology 66:2682-2684. (J. Series No. 12877)

Moisture loss and lipid oxidation for precooked beef patties stored in edible coatings and films. Journal of Food Science 65:300-304. (J. Series No. 12672)

Book Chapters


M.S. Theses

Flennoy, J. 2000. Chemical and physical properties of traditional and instant masa flour. (D.S. Jackson, Advisor)

Ph.D. Dissertations


Searns, G.W. 2000. Characterization of the energy-sensing module of the Rsb cascade in Bacillus subtilis. (A.K. Benson, Advisor)


M.S. Theses

Flennoy, J. 2000. Chemical and physical properties of traditional and instant masa flour. (D.S. Jackson, Advisor)

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### Plant Pathology Department

#### Journal Articles


Baenziger, P.S., A. Mitra, and Book Chapters


W.G. Langenberg, A. Mitra, and

Zhang, L., J.J. Rybczynski, W.C. Langenberg, A. Mitra, and


Structure and assembly of large, lipid-containing dsDNA viruses. Nature Structural Biology 7:101-103. (J. Series No. 12744)


Effects of culture fluids and preinduction of chitinase production on biocontrol of Bipolaris leaf spot by Stenotrophomonas maltophilia C3. Biological Control 18:277-286. (J. Series No. 12763)


The role of chitinase production by Stenotrophomonas maltophilia strain C3 in biological control of Bipolaris sorokiniana. Phytopathology 90:384-389. (J. Series No. 12464)

Book Chapters


Protecting the value in value added crops: Intellectual property rights, p. 239-248. In: C.F. Murphy and D.M. Peterson (eds.), Designing crops for added value. American Society of Agronomy, Madison, WI.


Ph.D. Dissertation

Ma, C. 2000.

Tandem repeat sequences in a transcriptional unit cause high frequency transgene silencing in primary transgenic tobacco. (A. Mitra, Advisor)

School of Natural Resource Sciences

Journal Articles


Trace analysis of ethanol and MTBE in water using solid phase microextraction and gas chromatography/mass spectrometry. Analytical Chemistry 72:4654-4658. (J. Series No. 12979)


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)


A southward migration of centennial-scale variations of drought/flood in eastern China and the western United States. Journal of Climate 14:1323-1328. (J. Series No. 13073)


Rapid spectrophotometric determination of 2,4,6-trinitrotoluene in a Pseudomonas enzyme assay. Journal of Microbiological Methods 42:149-158. (J. Series No. 12803)


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Aerobic TNT reduction via 2-hydroxyxalamin-4,6-dinitrotoluene by Pseudomonas aeruginosa strain MX isolated from munitions-contaminated soil. Bioremediation Journal 4:111-124. (J. Series No. 12566)


Communicating agrometeorological information to farming communities. Agricultural and Forest Meteorology 103:185-196. (J. Series No. 12572)
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Agricultural Systems 68:137-150. (J. Series No. 12767)

Drought preparedness and response in the context of sub-Saharan Africa. 
Journal of Contingencies and Crisis Management 8:81-92. (J. Series No. 12939)

Planning for drought: Moving from crisis to risk management. 
Journal of the American Water Resources Association 36:697-710. (J. Series No. 12766)

Standardized Precipitation Index and nitrogen rate effects on yields and risk analysis of maize in dryland cropping systems. 
Agriculture, Ecosystems, and Environment 80:113-120. (J. Series No. 12548)

Referred Proceedings


Books


Early warning systems for drought preparedness and management. World Meteorological Organization, Geneva, Switzerland.


<table>
<thead>
<tr>
<th>Ph.D. Dissertations</th>
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<tbody>
<tr>
<td>McFeeters, S.K. 2000. Characterizing the impact of vegetation-water interfaces as they affect composite spectral signals. (D.C. Rundquist, Advisor)</td>
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<table>
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<tr>
<th>M.S. Theses</th>
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<tr>
<td>Derry, D.P. 2000. Monitoring corn development via close-range and aerial remote sensing. (D.C. Rundquist, Advisor)</td>
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<tr>
<td>Pearson, T.J. 2000. The use of benthic macroinvertebrates by rainbow trout (Oncorhynchus mykiss) in Lake Ogallala, Nebraska. (E.J. Peters, Advisor)</td>
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<td>Reade, C.N. 2000. Larval fish drift in the lower Platte River, Nebraska. (E.J. Peters, Advisor)</td>
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<th>Veterinary and Biomedical Sciences</th>
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<tr>
<td><strong>Journal Articles</strong></td>
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<tr>
<td>Devireddy, L. and C.J. Jones. 2000. Olf-I, a neuron-specific transcription factor, can activate the herpes simplex virus 1 ICP0 promoter. Journal of Biological Chemistry 275:77-81. (J. Series No. 12858)</td>
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### Human Resources and Family Sciences Departments

#### Family and Consumer Sciences

**Journal Articles**

<table>
<thead>
<tr>
<th>Author(s)</th>
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**Ph.D. Dissertations**

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<tr>
<td>Falter, J.</td>
<td>The company as family: Perceived strengths of Duncan Aviation.</td>
<td>(J. DeFrain, Advisor)</td>
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<td>Xia, Y.R.</td>
<td>Chinese adolescents’ involvement in the family decision-making processes and the parent-adolescent communication and relationship.</td>
<td>(J. DeFrain, Advisor)</td>
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<tr>
<td>Zhou, G.Z.</td>
<td>The relationship between preschool children’s emergent literacy status and home literacy activities.</td>
<td>(P. Zeece, Advisor)</td>
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### Nutritional Science and Dietetics

**Journal Articles**

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### Book Chapters

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### M.S. Theses

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<tr>
<th>Author(s)</th>
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<tr>
<td>Jones, J.E., J. DeFrain, L. Ernst, and N. DeFrain.</td>
<td>The teacher’s role in helping young people survive and transcend a traumatic childhood.</td>
<td>Journal of Family and Consumer Sciences 92: 51-52. (J. Series No. 13075)</td>
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### Ph.D. Dissertations

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### Nutritional Science and Dietetics

**Journal Articles**

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<th>Author(s)</th>
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Covey, L.C. 2000. Written survey to compare the perceptions of diet quality and physical activity level between nutrition educators and limited resource clientele. (W.M. Koszewski, Advisor)


**Book Chapters**


Nyberg, E.J. 2000. The relationship between time to eat school lunch and nutrient consumption. (M.I. Schnepf, Advisor)

Sindelar, C.A. 2000. Serum lipid response to inclusion of omega-3 fatty acid enriched eggs in diets of physically active adults. (N.M. Lewis, Advisor)


**Textiles, Clothing and Design**

**Journal Articles**


**Books**


**M.S. Theses**


**Off-Campus Research Centers**

**Northeast Research and Extension Center**

**Journal Articles**


Refereed Proceedings


**Refereed Proceedings**


**Book Chapter**


**West Central Research and Extension Center**

**Journal Articles**


**Refereed Proceedings**


**Book Chapters**


**M.S. Theses**

Richardson, D.M. 2000. Vegetation Response to Stocking Rate and Grazing Frequency on Sandhills Meadows. (J.D. Volesky and W.H. Schacht, Advisors)

Wilson, Casey. 2000. Undegradable intake protein supplementation to growing cattle. (D.C. Adams and T.J. Klopfenstein, Advisors)

**Ph.D. Dissertation**

Patterson, Hubert H., III. 2000. Protein supplementation to pregnant heifers and grazing management effects on cow diet quality. (D.C. Adams and T.J. Klopfenstein, Advisors)
RD 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 extramural 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

Industry Grants .......................... $9,184,314

Total Grants and Contracts ................. $20,586,077

Product Sales ................................ $9,913,842

Total Expenditures ........................ $63,748,703

*$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

<table>
<thead>
<tr>
<th>Expenditure Category</th>
<th>State Appropriated and Hatch Funds</th>
<th>Federal Grants</th>
<th>Industry Grants</th>
<th>Revolving Funds</th>
<th>All Funds</th>
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<tbody>
<tr>
<td>Salaries, Wages and Benefits</td>
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<td></td>
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<tr>
<td>Faculty/Administrative</td>
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<td>4.5</td>
<td>3.2</td>
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<tr>
<td>Managerial/Prof</td>
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<td>6.7</td>
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<td>Office/Service</td>
<td>11.3</td>
<td>4.8</td>
<td>9.8</td>
<td>14.4</td>
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<tr>
<td>Hourly Wages</td>
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<td>2.6</td>
<td>4.0</td>
<td>2.8</td>
<td>1.9</td>
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<tr>
<td>GRA Stipends</td>
<td>5.5</td>
<td>16.3</td>
<td>14.7</td>
<td>2.0</td>
<td>8.5</td>
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<td>Benefits</td>
<td>13.6</td>
<td>5.8</td>
<td>7.0</td>
<td>5.4</td>
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<td>Subtotal:</td>
<td>85.2</td>
<td>40.2</td>
<td>45.3</td>
<td>31.7</td>
<td>61.5</td>
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## Operating

<table>
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<tr>
<th></th>
<th>State Appropriated and Hatch Funds</th>
<th>Federal Grants</th>
<th>Industry Grants</th>
<th>Revolving Funds</th>
<th>All Funds</th>
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<tbody>
<tr>
<td>Supplies and Expenses</td>
<td>11.1</td>
<td>54.9</td>
<td>41.2</td>
<td>48.3</td>
<td>30.3</td>
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<td>Travel</td>
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<td>5.0</td>
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<tr>
<td>Equipment</td>
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<td>8.4</td>
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<td>Subtotal:</td>
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<td>54.7</td>
<td>68.3</td>
<td>38.5</td>
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<td>Total:</td>
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Agricultural Research Division  
Selected Research Program Information

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<th>Category</th>
<th>FY 1999</th>
<th>FY 2000</th>
<th>FY 2001</th>
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<td><strong>Project Information:</strong></td>
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<tr>
<td>Projects at beginning of year</td>
<td>368</td>
<td>399</td>
<td>383</td>
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<tr>
<td>Projects terminating</td>
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<td>42</td>
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<td>Projects revised</td>
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<td>6</td>
<td>14</td>
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<tr>
<td>New projects</td>
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<td>Projects at the end of the year</td>
<td>399</td>
<td>383</td>
<td>395</td>
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<tr>
<td><strong>Faculty full-time equivalents (FTE)</strong></td>
<td>129.9</td>
<td>130.4</td>
<td>130.2</td>
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<tr>
<td><strong>Expenditures for budgeted research faculty:</strong></td>
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<tr>
<td>Federal formula and state approp., $/FTE(^1)</td>
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<td>$241,259</td>
<td>$255,367</td>
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<tr>
<td>Grant and contracts, $/FTE</td>
<td>$135,262</td>
<td>$138,217</td>
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<td>Product sales, $/FTE</td>
<td>$51,357</td>
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<tr>
<td><strong>Outputs from research programs(^2):</strong></td>
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<tr>
<td>Refereed journal articles</td>
<td>274</td>
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<td>Research bulletins</td>
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<td>45</td>
<td>97</td>
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<td>M.S. and Ph.D. theses</td>
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<td>115</td>
<td>128</td>
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<td>Cultivars and germplasm released</td>
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<td>17</td>
<td>18</td>
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<tr>
<td>Patents obtained</td>
<td>3</td>
<td>6</td>
<td>2</td>
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</table>

\(^1\)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