

2001

# Agricultural Research Division Annual Report 2001

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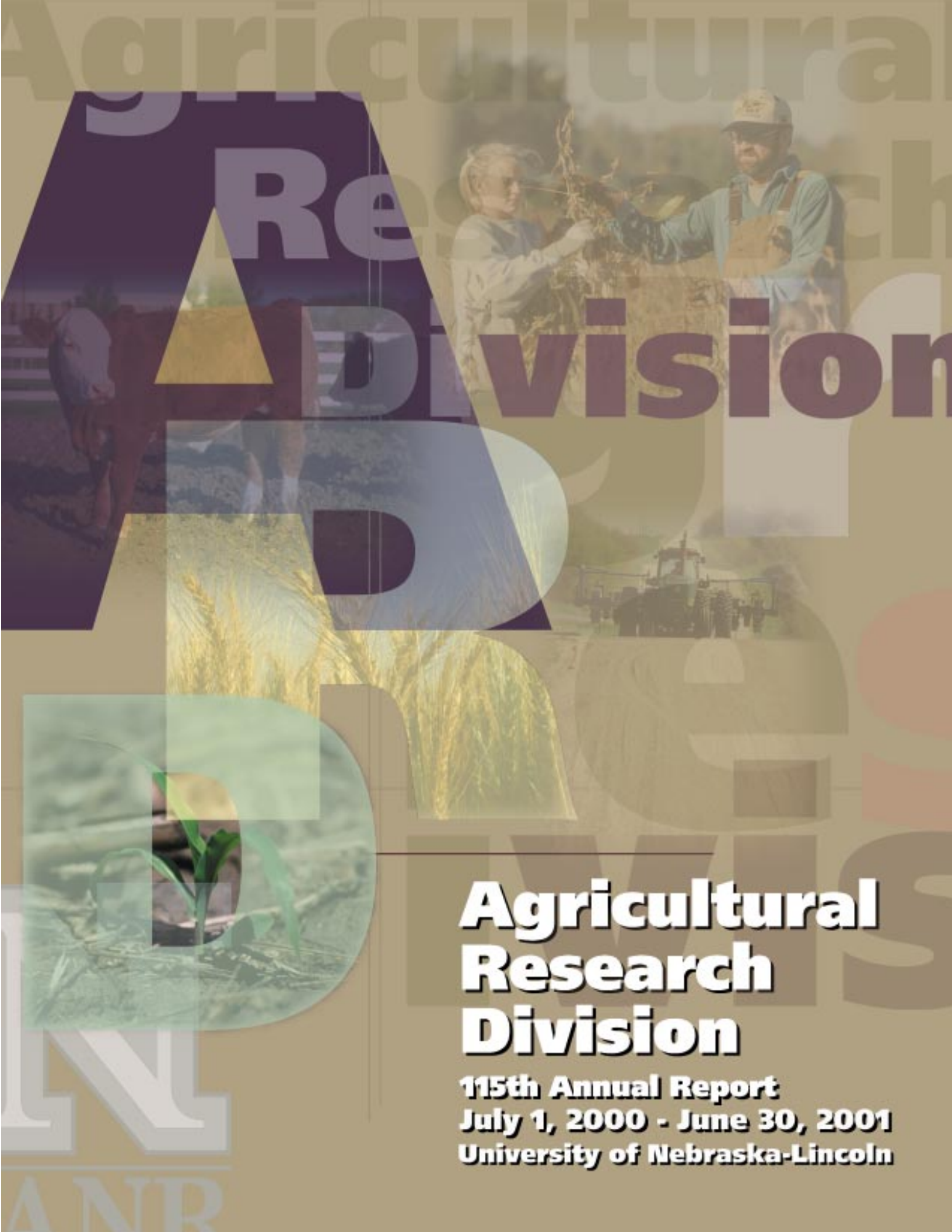


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# **Agricultural Research Division**

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

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

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

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## **Our Mission**

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



Darrell W. Nelson

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

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

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

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

Darrell W. Nelson  
Dean and Director  
Agricultural Research Division

# Research Highlights

**T**he 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



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

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.



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

## IANR soybean team helps devise genetic map

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

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

The IANR lab developed one of three soybean populations used to construct the map, which locates genes to certain segments of the individual chromosomes. Once the researchers had located spe-

cific segments, they flanked these with genetic markers. Genetic markers are either genes that code for readily identifiable plant traits or special DNA segments used for easy identification. More than 1,800 genetic markers now serve as "landmarks" on the soybean map.

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

## Team eyes potential impacts of MTBE, ethanol contamination

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

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

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

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

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

## Turning eggshell waste into dietary supplements

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

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

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

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





calcium source in chicken feed.

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

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

## Lots more trees would significantly impact Sandhills

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

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

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

The Nebraska National Forest near Halsey was once treeless prairie. Comparing plots ranging from dense pine forest to native prairie, an IANR forest ecologist and UNL School



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

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 groundwater supplies by using water that now recharges the aquifer.

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

## Faster winter gains more profitable in the long run

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

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

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

Compensatory gain for slow winter gainers runs 20 percent to 30 percent. Steers fed for faster winter gains maintain up to 80 percent of their weight

advantage entering the feedlot after summer grazing.

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

## One-of-a-kind program aids cattle breeders

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

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

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

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

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

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



## Smoking, drinking, poor diet — bad habits cluster

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

An IANR nutrition science team found that bad habits tend to cluster. People with

one tend to have the others, too. Compared with non-smokers, smokers tend to eat fewer foods rich in protective antioxidants, eat more high-fat foods and drink more alcohol.

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

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

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

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

## Timing is key to effective weed control

When it comes to post-emergent weed control, timing is everything, according to IANR research. Applying

weed control measures at the right moment can save time and money.

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

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

The team concluded that increases in nitrogen reduced the competition between corn and weeds for nutrients, allow-

ing corn to tolerate weed presence longer.

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

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

## Tortilla-making process reduces wastewater concerns

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



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

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

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

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

## Research helps explain strong rural work ethic

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

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

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

He found that nearly 40 percent of Nebraska agriculture workers are 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.



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

## Conservation plantings: protection and income, too

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

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

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

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

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

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

## Recommendations for Panhandle dryland corn

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

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

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

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

## Eyeing potential of transgenic high-oil soybeans

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

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

NU is seeking a patent on the technique used to produce the plants, involving a patented gene from the DuPont Corp.,

that turns off two genes in soybean cells, allowing cells to increase oleic acid content.

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

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

lines and evaluate the offspring. Researchers now are concentrating on producing enough oil for larger-scale testing.

## Simple treatment decontaminates soil inexpensively

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

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

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

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

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



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

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

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

## Assessing, classifying water quality in Nebraska lakes

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

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

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

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



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

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

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

## Fertilizing dryland wheat boosts yields, grain quality

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

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

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

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

## Rural residents not big on cybershopping

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

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

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

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

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

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

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

## a few more glimpses at ARD research ...

- ▶ Switching weed control efforts from spring to fall can significantly improve perennial weed control. IANR weed science research shows that applying herbicides after the first fall frost provides the best control by disrupting the plants' overwintering ability. Traditionally, farmers apply herbicides in the spring when weeds emerge, killing about half of the weeds. Applying herbicides in the fall after the first frost can kill up to 90 percent of the weeds.
- ▶ The latest Nebraska Rural Poll showed that nearly two-thirds of rural Nebraskans say their income hasn't kept pace with the cost of living and 61 percent faced at least one economic hardship in the past year. For the past six years, IANR researchers in the university's Center for Applied Rural Innovation have surveyed rural Nebraskans about quality of life and policy issues. These and other poll results provide a rural perspective for decision makers, lawmakers and others making public policy choices and planning for the state's future.
- ▶ An entomology graduate student's discovery is helping beekeepers check their hives for potentially devastating varroa mites. Her IANR research found that dusting caged honey bees with powdered sugar and shaking them in a canning jar with a screened lid is a fast, inexpensive way to detect the mites.

She came up with the idea while seeking an easier way to gather mites from bees for lab tests. Commercial beekeepers now use her technique for early detection, which is key to preventing mite infestations from destroying honey bee colonies.

- ▶ Lake Ogallala is a well-known Nebraska trout fishing spot, but low dissolved oxygen levels sometimes contribute to fish kills. NU, state and private researchers are teaming to determine what causes this periodic problem and to find ways to solve it. They've extensively studied and sampled the lake. They've also constructed a scale model to reproduce the lake's water flow patterns and characteristics and experiment on how to improve conditions for fish. The team will use findings to develop recommendations on what should be done to protect the lake's water quality.
- ▶ An IANR climatologist's study of 111 years of Nebraska rainfall indicates we may be entering a dry decade. Highly sophisticated data analyses and advanced computer modeling data revealed a 20-year precipitation cycle of alternating wet and dry decades. The 1990s were a wet period. Farmers shouldn't worry yet, though. The study also showed "less organized precipitation patterns" emerging in the last 20 years. That may mean a changing cycle or could be an oddity that disappears when data is analyzed 10 years from now.

- ▶ IANR research on nematodes may lead to recommendations about ways to manage agricultural ecosystems using fewer or no pesticides. As part of a multiuniversity research project, NU plant pathologists are documenting all nematodes at undisturbed sites in the Konza Prairie in Kansas. The Nebraska team is a leader in developing molecular techniques for nematode 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 dyeing fabrics made with polylactic acid, or PLA, a water-resistant biodegradable resin made from cornstarch. She and a graduate student tested dyes and identified two that held up to sunlight and launderings. Industry has expanded this IANR research, identifying ways to produce a wide range of colorfast shades on PLA fabrics.
- ▶ NU's Veterinary Diagnostic Center took on nearly 12,000 cases in 2000, about 986 per month. The IANR center processes animal disease cases from Nebraska and across the nation, helping to diagnose, respond to and prevent disease outbreaks. Cases come from traditional livestock producers, veterinarians, zoos, parks and family homes.

# Faculty Awards and Recognitions

**T**he impact and quality of ARD research can be assessed in many ways. One measure of excellence is the recognition researchers' work receives from peers and from those who benefit from the research. A number of ARD faculty members are widely recognized as leaders in their disciplines, and a number received international, national, regional and/or state honors.

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

## Agricultural Economics

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

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

## Agricultural Leadership, Education and Communication

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

## Agronomy and Horticulture Department

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

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

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

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

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

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

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

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

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

**Martin A. Massengale** received the Exemplary Service to Agriculture Award from the Nebraska AgRelations Council.

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



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

## Animal Science

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

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

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

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

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

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

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

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

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

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

## Biochemistry

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

**Raymond Chollet** served as an invited peer-review panelist for the U.S. National Science Foundation's Molecular and Cellular Biosciences Division in Arlington, VA, and was 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.



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

## Biological Systems Engineering

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

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

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

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

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

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

## Entomology

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

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

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



## Food Science and Technology

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

## Veterinary and Biomedical Sciences

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

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

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

## Family and Consumer Sciences

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

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

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

## Textiles, Clothing and Design

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

## Northeast Research and Extension Center

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

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

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

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

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

# Graduate Student Awards and Recognitions

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

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

## Agricultural Economics

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

## Agronomy and Horticulture Department

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

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

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

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

**Andrea Ebmeier** received the Pioneer Fellowship from Pioneer Hybrid International.

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

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

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

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

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

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

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

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

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

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

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

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

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

## Animal Science

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

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

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

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

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

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

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

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

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

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

**Uaichai Puthponsiriporn** received a Graduate Scholarship from Continental Grain.

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

## Biochemistry

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

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

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

## Biological Systems Engineering

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

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

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

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

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

## Entomology

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

## School of Natural Resource Sciences

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

## Veterinary and Biomedical Sciences

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

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

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

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

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

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

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

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

## Family and Consumer Sciences

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

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

**Wenli Liu** received the Founders Fellowship from Phi Upsilon Omicron.

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

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

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

## Nutritional Science and Dietetics

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

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

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

## Northeast Research and Extension Center

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

## South Central Research and Extension Center

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

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

# Undergraduate Honors Student Research Program

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

## Agricultural Economics

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

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

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

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

## Agricultural Leadership, Education and Communication

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

## Animal Science

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

## Biochemistry

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

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

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

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

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

## Biological Systems Engineering

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

## Entomology

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

## Plant Pathology

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

## Veterinary and Biomedical Sciences

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

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

## Water Center

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

# Variety and Germplasm Releases

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

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

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

## Agronomy/Horticulture

<i>Crop:</i>	Grain Sorghum [ <i>Sorghum bicolor</i> (L.) Moench]
<i>Germplasm Release:</i>	44 Pairs of Grain Sorghum Seed parent (A-Line) and their Respective Maintainers (B-Lines) (N341 A + B to N384 A + B)
<i>Scientists:</i>	D.J. Andrews and J.F. Rajewski
<i>Characteristics:</i>	These seed parents are in the medium to full season maturity class for SE Nebraska and similar environments which are male sterile in the A <sub>1</sub> cms system (milo cytoplasm). The germplasms were developed in the program to introgress tropically adapted food quality grain sorghums into sorghum seed parents adapted to the U.S. high plains. These lines resulted from emasculation crosses made from 1988 to 1992. Generally pedigree selection was followed from F <sub>2</sub> to F <sub>6</sub> 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.

<i>Crop:</i>	Grain Sorghum [ <i>Sorghum bicolor</i> (L.) Moench]
<i>Germplasm Release:</i>	49 Grain Sorghum Male Fertility Restorer Germplasms (R Lines) (N385R - N433R)
<i>Scientists:</i>	D.J. Andrews and J.F. Rajewski
<i>Characteristics:</i>	These germplasms restore male fertility in hybrids made with A <sub>1</sub> cms (milo cytoplasm) seed parents. The restorer lines were developed to introgress grain sorghum food quality germplasm from tropical breeding programs into parental lines adapted to the high plains region of the USA. Emasculation crosses were made between 1987 and 1994 and pedigree selection continued from F <sub>2</sub> to between F <sub>7</sub> and F <sub>12</sub> 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.
<i>Crop:</i>	Grain Sorghum [ <i>Sorghum bicolor</i> (L.) Moench]
<i>Germplasm Release:</i>	27 Grain Sorghum Maintainer (B-Line) (N433B - N457B) or Restorer (R Line) Germplasms (N458R - N460R)
<i>Scientists:</i>	D.J. Andrews, J.F. Rajewski, and P.J. Bramel-Cox
<i>Released by:</i>	University of Nebraska Agricultural Research Division and the Kansas State University Sorghum Research Program

**Characteristics:** These grain sorghum germplasms will either completely maintain male sterility (B lines) or will restore male fertility (R lines) in the A<sub>1</sub> cms system (milo cytoplasm). These germplasms were selected in Nebraska from segregating S<sub>3</sub> and S<sub>4</sub> families provided by the Kansas State program to the UNL program in 1996. Days to bloom range from 65 to 97 days, and plant height ranges from 82 cm to 130 cm. Sixteen germplasms have tan plant color, and grain color in all but two are strong white to yellow endosperm. The pest and disease reactions of these germplasms have not been determined. Because of their unique parentage, these germplasms contribute new genetic diversity for the development on new hybrids.

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

**Germplasm Release:** 28 Grain Sorghum F<sub>4</sub> to F<sub>6</sub> Germplasm Families (N461-N488)

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

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

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

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

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

**Characteristics:** These B line germplasms were developed in the program conducted at the High Plains Agricultural Laboratory, Sidney, NE, to produce early maturing seed parents for western Nebraska. Generally pedigree selection from F<sub>2</sub> to F<sub>5</sub> or F<sub>6</sub> was conducted at Sidney with alternate generations in the winter nurseries in Mexico. In general, these lines are average to short in height and early in maturity. Days to bloom range from 66 to 81 days. All but 2 have tan plant color, and all but 3 have light red colored grain. Pest and disease reactions of these lines have not been determined. Because of their parentage these seed parents contribute new genetic diversity for the development of very early maturing hybrids. The tan plant red grain lines will permit the development of attractive bronze grain hybrids.

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

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

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

**Characteristics:** These early maturing grain sorghum R-lines germplasms restore male fertility in the A<sub>1</sub> cms system (milo cytoplasm). The lines were developed in the program conducted at the High Plains Agricultural Laboratory, Sidney, Nebraska, to produce early maturing hybrid parents for western Nebraska. They resulted from emasculation crosses made in 1992 to 1994 between early maturing restorer lines under development and some tropical food quality introductions. In general, these germplasms are average to short in height, and early to bloom. Days to bloom range from 56 to 84 days. Grain color of all but 3 pale red grain germplasms is white or pale yellow endosperm. Twenty-nine germplasms have tan plant color, and 19 purple. Pest and disease reactions of these lines have not been determined. These restorer germplasms offer new genetic diversity for the development of very early maturing hybrids.

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

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

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

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

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

**Variety Name:** Millennium

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

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

**Characteristics:** ‘Millennium’ was released primarily for its superior adaptation to dryland wheat production systems in Nebraska (except southeastern Nebraska) and similar growing areas in South Dakota and adjacent states. Millennium is an awned, white-glumed cultivar. Its field appearance is most similar to ‘Arapahoe’. After heading, the canopy is moderately open and upright. The flag leaf is erect and twisted at the boot stage. The foliage is green with waxy bloom at anthesis. The leaves are glabrous. The spike is tapering in shape, long, and middense. The glume is short to midlong and midwide, and the glume shoulder is square to rounded. The beak is medium in length with an acuminate tip. The spike is usually nodding at maturity. Kernels are red colored, hard textured, midlong, and elliptical in shape. The kernel has no collar, a midsize brush of medium length, rounded cheeks, midsize germ, and a narrow and shallow crease. The main

advantage Millennium has when compared to most other available wheat cultivars, within its area of adaptation, is its high grain yield, ability to yield well under favorable production conditions, and broad adaptation in dryland production systems. It is medium in maturity and has a shorter length coleoptile. It has good strong straw strength, and good to very good winter-hardiness similar to Abilene and comparable to other winter wheat cultivars adapted and commonly grown in Nebraska. Millennium is moderately resistant to stem rust, leaf rust, and Hessian fly (*Mayetiola destructor* Say), and susceptible to wheat soilborne mosaic virus, and barley yellow dwarf virus. The overall end-use quality characteristics for Millennium should be acceptable to the milling and baking industries.

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

**Variety Name:** Cougar

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

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

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



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

<i>Crop:</i>	Hard White Winter Wheat ( <i>Triticum aestivum</i> L.)
<i>Variety Name:</i>	Nuplains
<i>Scientists:</i>	C.J. Peterson, R.A. Graybosch, D.R. Shelton, D.D. Baltensperger, P.S. Baenziger, L.A. Nelson, D.V. McVey, J.E. Watkins, and J. Krall
<i>Released By:</i>	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
<i>Characteristics:</i>	‘Nuplains’ was released for its breadmaking quality and white grain color combined with adaptation, grain yield potential, and disease resistance for production in the north central Great Plains. Nuplains appears to be best suited for dryland production areas in south central and southwest Nebraska and to similar areas in adjacent states. It also has shown promise for use in irrigated production systems in southwest and western Nebraska. Nuplains is an awned, white-glumed, semi-dwarf cultivar with straw strength superior to ‘Arapahoe’. Plant height of Nuplains has averaged 3 cm shorter than ‘2137’ and 10 cm shorter than Arapahoe. It has a short coleoptile. Winterhardiness is adequate for Nebraska growing conditions. It is a medium maturing cultivar under Nebraska conditions, with heading date averaging 2 to 3 days earlier than Arapahoe. Nuplains has exhibited adult-plant and seedling resistance to stem rust. It is moderately susceptible to current races of leaf rust, and is susceptible to soil-

borne mosaic virus, wheat streak mosaic virus, the Great Plains biotype of Hessian fly (*Mayetiola destructor* Say), and the Russian wheat aphid (*Diuraphia noxia* Mordvilko). Nuplains has mellow dough mixing properties with acceptable mixing tolerance. It was found to have acceptable end-use quality for commercial bread applications. Nuplains was evaluated for use in Asian noodle products by the Wheat Marketing Center, Portland, OR. In Taiwanese raw and Hokkien style noodle evaluations, Nuplains has received acceptable ratings for dough handling, machining properties, and noodle texture. Noodle color ratings varied, but were generally considered as less than desirable due to discoloration after 24 hours of storage. Grain samples were provided to the USDA-GIPSA for classification purposes. Grain color of Nuplains was considered as acceptable for the hard white wheat class.

## Animal Science

### Swine Release

<i>Germplasm Release:</i>	NE Index Line
<i>Scientist:</i>	Rodger Johnson
<i>Released by:</i>	University of Nebraska Animal Science Department, Nebraska Agricultural Research Division, and University of Nebraska Office of Research Grants and Services.
<i>Characteristics:</i>	The Nebraska Index Line is a novel line with superior reproduction that was developed during a 20-year selection experiment. Traits selected for include ovulation rate, uterine capacity and litter size. Crosses of the NE line with other commercially available lines have had 35% greater production per breeding female than other commercially available lines.

## Plant Pathology

<i>Crop:</i>	Dry Bean ( <i>Phaseolus vulgaris</i> L.)
<i>Variety:</i>	‘Anacaona’ White Bean
<i>Scientists:</i>	J.C. Nin, E. Arnaud-Santana, F. Saladin, G. Godoy-Lutz, D.P. Coyne, J.S. Beaver, and J.R. Steadman

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

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

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

**Variety:** ‘Arroyo Loro Negro’ black bean

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

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

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

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

**Variety:** ‘CIAS-95’ red mottled bean

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

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

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

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

**Variety:** ‘Saladin-97’ red mottled bean

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

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

**Characteristics:** Saladin-97 has field resistance to strains of the common blight pathogen. It is susceptible to Type II of the bean golden mosaic virus, resistant to bean common mosaic virus NY-15 strain, and susceptible to bean common mosaic necrotic virus-NL3 strain. Saladin-97 exhibited partial resistance to rust in the field, but was resistant to only 3 out of 10 DR rust pathotypes in a greenhouse inoculation test. Yields ranged from 1309 to 2073 kg ha<sup>-1</sup>, 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

<p>d after planting. The seeds are light red mottled, elliptically shaped, and medium sized (42-44 g 100<sup>-1</sup> seeds). The number of pods per plant is between 13 and 15 with 3-4 seeds per pod.</p> <p><i>Crop:</i> Dry Bean (<i>Phaseolus vulgaris</i> L.)</p> <p><i>Variety:</i> ‘JB-178’ red mottled bean</p> <p><i>Scientists:</i> E. Arnaud-Santana, J.C. Nin, F. Saladin, G. Godoy-Lutz, J.S. Beaver, D.P. Coyne and J.R. Steadman</p>	<p><i>Characteristics:</i> 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<sup>-1</sup> 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.</p>
<p><i>Released By:</i> Centro de Investigacion Agricola del Suroeste, Ministry of Agriculture, Dominican Republic, in cooperation with the University of Puerto Rico and the University of Nebraska</p>	
<p><i>Characteristics:</i> 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<sup>-1</sup> 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<sup>-1</sup> seeds.</p>	<p><i>Crop:</i> Dry Bean (<i>Phaseolus vulgaris</i> L.)</p> <p><i>Variety:</i> Wei hing</p> <p><i>Scientists:</i> D.P. Coyne, D.S. Nuland, D.T. Lindgren, J.R. Steadman, D.W. Smith, J. Gonzales, J. Schild, J. Reiser, L. Sutton, C. Carlson, J.R. Stavelly and P. Miklas</p>
<p><i>Crop:</i> Dry Bean (<i>Phaseolus vulgaris</i> L.)</p> <p><i>Variety:</i> ‘PC-50’ red mottled bean</p> <p><i>Scientists:</i> F. Saladin, E. Arnaud-Santana, J.C. Nin, G. Godoy-Lutz, J.S. Beaver, D.P. Coyne, and J.R. Steadman</p>	<p><i>Released By:</i> University of Nebraska Agricultural Experiment Station and United States Department of Agriculture, Agricultural Research Service</p>
<p><i>Released By:</i> Centro de Investigacion Agricola del Suroeste, Ministry of Agriculture, Dominican Republic in cooperation with the University of Nebraska and the University of Puerto Rico</p>	<p><i>Characteristics:</i> Great northern ‘Wei hing’ 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. Wei hing has large white seeds, and yields were similar to standard great northern cultivars Harris and Beryl.</p>

# Copyrights and Patents

**C**opyright 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.

Patent Title	Nucleotide Sequences and Method for Detection of <i>Serpulina hyodysenteriae</i>
Patent Numbers	American Type Culture Collection Deposit No. 75826; United States Patents 5,698,394; 5,869,630 and 6,068,843
Scientists	G.E. Duhamel and R.O. Elder
Description	This invention provides an improved method for detecting the presence of <i>Serpulina hyodysenteriae</i> in a biological sample, an oligonucleotide primer and an <i>S. hyodysenteriae</i> 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 <i>S. hyodysenteriae</i> 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.

## Veterinary and Biomedical Sciences

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

**A**RD 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 McCain<sup>1</sup>, Temporary/On Call

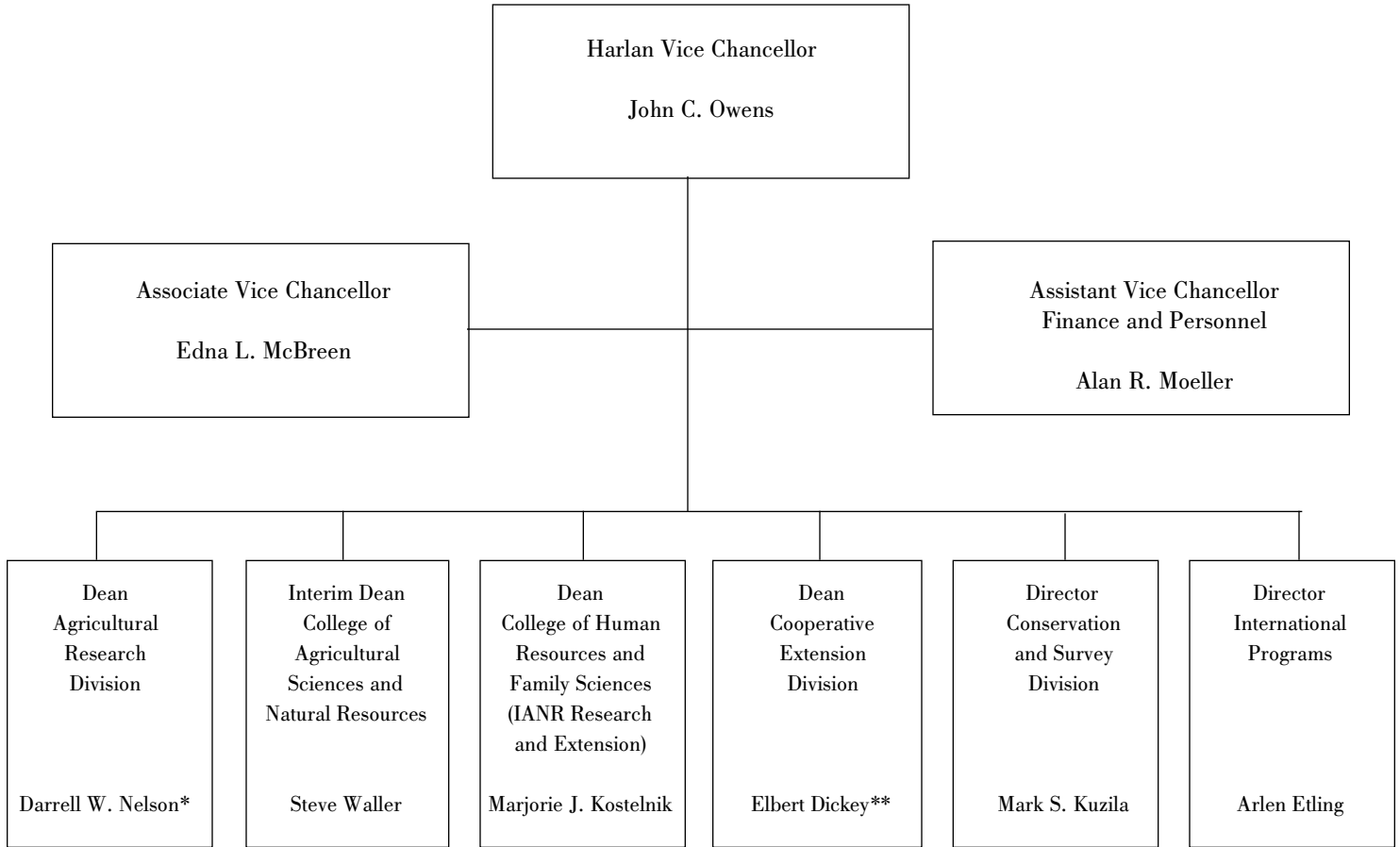
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<sup>1</sup>Temporary appointment

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## Organizational Chart

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



\*Director, Nebraska Agricultural Experiment Station

\*\*Director, University of Nebraska Cooperative Extension

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

**Agricultural/Natural Resources Units**

*Agricultural Economics*  
Jeffrey Royer, Head

*Agricultural Leadership, Education and Communication*  
Earl Russell, Head<sup>1</sup>  
Susan Fritz, Head<sup>2</sup>

*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<sup>1</sup>

**Off-Campus Research Centers**

*Agricultural Research and Development Center*  
Ithaca—Daniel Duncan, Director

*Northeast Research and Extension Center*  
Concord—John Witkowski, Director

*Panhandle Research and Extension Center*  
Scottsbluff—Charles Hibberd, Director

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

*Southeast Research and Extension Center*  
Lincoln—Randy Cantrell, Director

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

**Interdisciplinary Centers**

*Biotechnology Center*  
Anne Vidaver, Director<sup>1</sup>  
Ruben Donis, Acting Director<sup>2</sup>

*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<sup>1</sup>

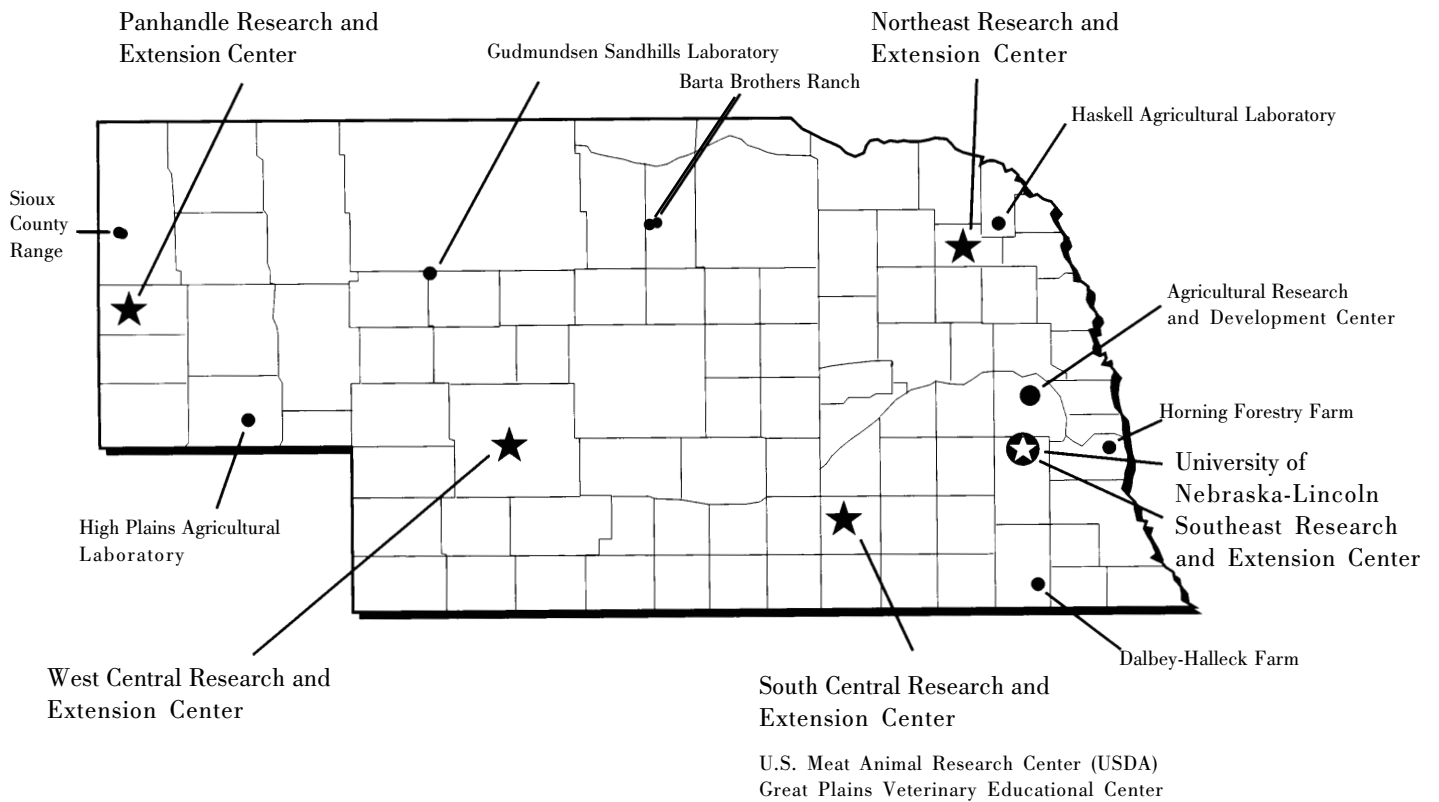
*Water Center/ Environmental Programs*  
Edward Vitzthum, Interim Director<sup>1</sup>  
Kyle Hoagland, Director<sup>2</sup>

*IANR Communications and Information Technology*  
Dan Cotton, Director

<sup>1</sup>Ended appointment during 2000-2001

<sup>2</sup>Began appointment during 2000-2001

## IANR Research Facilities



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

- Agricultural Research and Development Center — Ithaca
- Barta Brothers Ranch — Long Pine
- Dalbey-Halleck Farm — Virginia
- Gudmundsen Sandhills Laboratory — Whitman
- Haskell Agricultural Laboratory — Concord
- High Plains Agricultural Laboratory — Sidney
- Horning Forestry Farm — Plattsmouth
- Northeast Research and Extension Center — Norfolk
- Panhandle Research and Extension Center — Scottsbluff
- Sioux County Range — Mitchell
- South Central Research and Extension Center, Great Plains Veterinary Educational Center, and the U.S. Meat Animal Research Center (USDA) — Clay Center
- Southeast Research and Extension Center — Lincoln
- West Central Research and Extension Center — North Platte



**A**pproximately 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

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

## Agricultural Leadership, Education and Communication

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

<sup>1</sup> Ended research appointment during 2000-2001

<sup>2</sup> Began research appointment during 2000-2001

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

## Animal Science

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

<sup>1</sup>Ended research appointment during 2000-2001

<sup>2</sup>Began research appointment during 2000-2001

	<b>Rank</b>	<b>Rsch</b>	<b>Ext</b>	<b>Tch</b>	<b>Other</b>	<b>Area of Responsibility</b>
<b>Biochemistry</b>						
Robert V. Klucas	Professor	0.75		0.25		Head, Nitrogen Fixation
Lori A. Allison	Assistant Professor	0.80		0.20		Plant Molecular Genetics
Ruma V. Banerjee	Professor	0.85		0.15		Mechanistic Enzymology
Xin Bi	Assistant Professor	0.80		0.20		Regulating Gene Expressions
Raymond Chollet	Professor	0.80		0.20		Photosynthesis
Vadim N. Gladyshev	Assistant Professor	0.80		0.20		Protein Biochemistry, Selenium
Herman W. Knoche <sup>1</sup>	Professor	0.40		0.40		Lipid Biochemistry
John P. Markwell	Professor	0.60		0.20	0.20	Plant Biochemistry
Carolyn Price <sup>1</sup>	Associate Professor	0.25			0.75	Biochemistry
Stephen W. Ragsdale	Professor	0.85		0.15		Enzymes
Gautam Sarath	Associate Professor	0.80		0.20		Protein Biochemistry
Javier Seravalli	Assistant Professor				1.00	Enzymology
Robert J. Spreitzer	Professor	0.85		0.15		Plant Molecular Genetics
Shinichi Taoka	Assistant Professor				1.00	Protein Biochemistry
Donald P. Weeks	Professor	0.55		0.10	0.35	Plant Molecular Biology
Charles Wood	Professor	0.25			0.75	Virology
<b>Biological Systems Engineering</b>						
Glenn J. Hoffman	Professor	0.35	0.50	0.15		Head
Viacheslav I. Adamchuk	Assistant Professor	0.40	0.50	0.10		Precision Agriculture
Greg Bashford	Assistant Professor				Industry	Biomedical Engineering
Leonard L. Bashford	Professor	0.41		0.30	0.29	Tractors and Design Engineering
David Billesbach	Assistant Professor	0.05			0.50	Gaseous Emissions
Rhonda M. Brand	Assistant Professor	0.50		0.50		Environmental Health Engineer
Tami Brown-Brandl	Assistant Professor				USDA	Animal Environmental and Waste Management
L. Davis Clements	Professor				Industry	RPDL Company
Roger Eigenberg	Assistant Professor				USDA	Animal Environmental and Waste Management
Dean E. Eisenhauer	Professor	0.50		0.50		Hydrologic and Irrigation
Qi Fang	Assistant Professor	1.00			Industry	Bioprocessing Engineer
Thomas G. Franti	Associate Professor	0.25	0.75			Surface Water Management
Aris Gennadios	Associate Professor				Industry	Pharmaceutical Manufacturing
John E. Gilley	Professor				USDA	Soil Erosion
Robert D. Grisso <sup>1</sup>	Professor	0.25	0.35	0.40		Agricultural Machinery
Milford A. Hanna	Professor	0.45		0.10	0.45	Food and Bioprocess Engineering
Terry A. Howell	Professor				USDA	Irrigation Scheduling
David D. Jones	Associate Professor	0.35		0.65		Product Handling and Storage
Michael F. Kocher	Professor	0.40		0.55	0.05	Controls Engineer
Richard Koelsch	Associate Professor	0.21	0.49		0.30	Livestock Bioenvironmental Engineering
Derrel L. Martin	Associate Professor	0.65		0.35		Sprinkler Irrigation
Michael M. Meagher <sup>1</sup>	Associate Professor			0.20	0.80	Bioprocess Engineering
George E. Meyer	Professor	0.60		0.40		Plant Growth Modeling
Jack A. Nienaber	Professor				USDA	Animal Calorimetry
Dennis D. Schulte	Professor	0.50		0.50		Pollution Control and Energy Systems
LaVerne Stetson <sup>1</sup>	Professor				USDA	Agricultural Electricity
Mark Schrock <sup>1</sup>	Professor				USDA	Agricultural Machinery
Darrell Watts <sup>1</sup>	Professor	0.50	0.30			Water Quality/Irrigation
Curtis L. Weller	Professor	0.60		0.20	0.20	Food and Bioprocess Engineering
Wayne Woldt	Associate Professor	0.25	0.50		0.25	Bioenvironmental Engineering
Brian Woodbury	Assistant Professor				USDA	Animal Environmental and Waste Management

	Rank	Rsch	Ext	Tch	Other	Area of Responsibility
<b>Biometry</b>						
David B. Marx	Professor	0.50		0.50		Head, Statistical Consultant
Erin Blankenship	Assistant Professor	0.55		0.44		Statistical Consultant
Kent Eskridge	Professor	0.60		0.40		Statistical Consultant
Stephen D. Kachman	Associate Professor	0.75		0.25		Statistical Consultant
Anne Parkhurst	Professor	0.50		0.50		Statistical Consultant
Walter W. Stroup	Professor	0.50		0.50		Statistical Consultant
Linda J. Young	Professor	0.75		0.25		Statistical Consultant

## Entomology

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

<sup>1</sup>Ended research appointment during 2000-2001

<sup>2</sup>Began research appointment during 2000-2001

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

## Plant Pathology

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

<sup>1</sup>Ended research appointment during 2000-2001

<sup>2</sup>Began research appointment during 2000-2001

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



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

Rank	Rsch	Ext	Teh	Other	Area of Responsibility
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## Human Resources and Family Sciences Departments

### Family and Consumer Sciences

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

### Nutritional Science and Dietetics

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

### Textiles, Clothing and Design

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

<sup>1</sup>Ended research appointment during 2000-2001

<sup>2</sup>Began research appointment during 2000-2001

	Rank	Rsch	Ext	Tch	Other	Department (Area of Responsibility)
<b>Off-Campus Research Centers</b>						
<b>Northeast Research and Extension Center</b>						
John F. Witkowski	Professor	0.23	0.69		0.08	Director
Michael C. Brumm	Professor	0.50	0.50			Animal Science (Swine Production)
Thomas E. Hunt	Assistant Professor	0.50	0.50			Entomology (Entomologist)
Stevan Knezevic	Assistant Professor	0.50	0.50			Agronomy/Horticulture (Weed Science)
William L. Kranz	Assistant Professor	0.25	0.75			Biological Systems Engineering (Water Quality)
Terry L. Mader	Professor	0.50	0.50			Animal Science (Beef Cattle)
Charles A. Shapiro	Associate Professor	0.50	0.50			Agronomy/Horticulture (Soils and Crop Nutrition)
David P. Shelton	Professor	0.50	0.50			Biological Systems Engineering (Soil Conservation)
<b>Panhandle Research and Extension Center</b>						
Charles A. Hibberd	Professor	0.42	0.50		0.08	Director
Burton A. Weichenthal <sup>1</sup>	Professor	0.50	0.50			Animal Science (Beef Cattle)
David D. Baltensperger	Professor	0.30	0.20		0.50	Agronomy/Horticulture (Crop Breeding)
Jurg M. Blumenthal	Assistant Professor	0.50	0.50			Agronomy/Horticulture (Soil Fertility)
Dillon M. Feuz	Associate Professor	0.50	0.50			Agricultural Economics (Farm/Ranch Management)
Dale M. Grotelueschen	Professor	0.10	0.50		0.40	Veterinary and Biomedical Sciences (Diagnostic)
Bob Harveson	Assistant Professor	0.50	0.50			Plant Pathology
Gary L. Hein	Professor	0.50	0.50			Entomology (Entomology)
Drew J. Lyon	Associate Professor	0.50	0.50			Agronomy/Horticulture (Dryland Crops)
Alexander D. Pavlista	Associate Professor	0.25	0.75			Agronomy/Horticulture (Potatoes)
Patrick E. Reece	Associate Professor	0.50	0.50			Agronomy (Range and Forage)
Ivan G. Rush	Professor	0.25	0.75			Animal Science (Beef Cattle)
John A. Smith	Professor	0.50	0.50			Biological Systems Engineering (Machinery Systems)
Robert G. Wilson	Professor	0.50	0.50			Agronomy/Horticulture (Weed Science)
C. Dean Yonts	Associate Professor	0.50	0.50			Biological Systems Engineering (Irrigation)
<b>South Central Research and Extension Center</b>						
Alan Baquet	Professor	0.14	0.78		0.08	Director
Brian Benham	Assistant Professor	0.50	0.50			Biological Systems Engineering (Water Quality Management)
Roger Elmore	Professor	0.50	0.50			Agronomy/Horticulture (Crop Production)
Richard Ferguson	Professor	0.50	0.50			Agronomy/Horticulture (Soil Fertility)
Fred W. Roeth	Professor	0.50	0.50			Agronomy/Horticulture (Weed Control/ Water Quality)
Roger Selley	Associate Professor	0.25	0.75			Agricultural Economics (Farm Management)
James Stack	Assistant Professor	0.50	0.50			Plant Pathology (Diseases)
Robert Wright	Professor	0.50	0.50			Entomology (Biological Control)

	<b>Rank</b>	<b>Rsch</b>	<b>Ext</b>	<b>Tch</b>	<b>Other</b>	<b>Department (Area of Responsibility)</b>
<b>Southeast Research and Extension Center</b>						
Randy Cantrell	Professor	0.05	0.87		0.08	Director
<b>West Central Research and Extension Center</b>						
Gary W. Hergert	Professor	0.44	0.45		0.07	Director
Richard T. Clark	Professor	0.43	0.57			Interim Associate Director, Agricultural Economics (Farm and Ranch Management)
Don C. Adams	Professor	0.50	0.50			Animal Science (Range Cattle Nutrition)
John B. Campbell	Professor	0.50	0.50			Entomology (Livestock/Crops)
Gene H. Deutscher <sup>1</sup>	Professor	0.28	0.72			Animal Science (Beef Cattle Reproduction)
Steve Ensley <sup>2</sup>	Assistant Professor		0.50		0.50	Veterinary and Biomedical Sciences (Veterinary Toxicology and Diagnostic)
Dale T. Lindgren	Professor	0.50	0.50			Horticulture (Ornamentals)
Nancy Norton <sup>1</sup>	Instructor	0.50	0.50			Agricultural Economics (Farm/Ranch Management)
José Payero <sup>2</sup>	Assistant Professor	0.50	0.50			Biological Systems Engineering (Irrigation and Evapo Transporation)
Jerry Volesky	Assistant Professor	0.50	0.50			Agronomy/Horticulture (Range Management)
Gail A. Wicks	Professor	0.50	0.50			Agronomy/Horticulture (Ecofarming/Weeds)

## Interdisciplinary Activities

### Water Center/Environmental Programs

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

### Agricultural Research Division

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

<sup>1</sup>Ended research appointment during 2000-2001

<sup>2</sup>Began research appointment during 2000-2001

# Visiting Scientists and Research Associates

**T**he 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

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

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

### Animal Science

<i>Visiting Scientist:</i>	Arianna Bolla
<i>Country:</i>	Italy
<i>Expertise/Discipline:</i>	Animal genetics
<i>Visiting Scientist:</i>	Clendro Diaz
<i>Country:</i>	Brazil
<i>Expertise/Discipline:</i>	Swine reproduction
<i>Visiting Scientist:</i>	Helen Fairweather
<i>Country:</i>	Canada
<i>Expertise/Discipline:</i>	Ruminant nutrition
<i>Visiting Scientist:</i>	Manuel Gomez Gill
<i>Country:</i>	Venezuela
<i>Expertise/Discipline:</i>	Animal genetics
<i>Visiting Scientist:</i>	Joao Luis Lopes da Costa Rocha
<i>Country:</i>	United States/Texas
<i>Expertise/Discipline:</i>	Animal genetics
<i>Visiting Scientist:</i>	Ji-Woong Lee
<i>Country:</i>	Korea
<i>Expertise/Discipline:</i>	Animal genetics
<i>Visiting Scientist:</i>	Xuehong Liu
<i>Country:</i>	China
<i>Expertise/Discipline:</i>	Animal genetics
<i>Visiting Scientist:</i>	Namburi Singari
<i>Country:</i>	India
<i>Expertise/Discipline:</i>	Ruminant nutrition
<i>Visiting Scientist:</i>	Gary Snowder
<i>Country:</i>	United States/Idaho
<i>Expertise/Discipline:</i>	Animal genetics
<i>Visiting Scientist:</i>	Panwadee Sopannarath
<i>Country:</i>	Thailand
<i>Expertise/Discipline:</i>	Animal genetics

### Biochemistry

<i>Visiting Scientist:</i>	Fazoil Ataulakhanov
<i>Country:</i>	Russia
<i>Expertise/Discipline:</i>	Biophysics and computational biology
<i>Visiting Scientist:</i>	Chris Chastain
<i>Country:</i>	United States/Minnesota
<i>Expertise/Discipline:</i>	Plant molecular biology and biochemistry

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

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

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

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

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

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

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

## Entomology

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

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

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

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

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

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

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

## Plant Pathology

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

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

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

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

## School of Natural Resource Sciences

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

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

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

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

## Veterinary and Biomedical Sciences

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

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

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

## Post-Doctoral Research Associates

### Agronomy and Horticulture

<i>Research Associate:</i>	Usha Bishnoi
<i>State/Country:</i>	India
<i>Expertise/Discipline:</i>	Turfgrass transformation
<i>Research Associate:</i>	John Brejda
<i>State/Country:</i>	Nebraska/USA
<i>Expertise/Discipline:</i>	Collection and evaluation of native legumes and forbs
<i>Research Associate:</i>	Tony Buhr
<i>State/Country:</i>	Nebraska/USA
<i>Expertise/Discipline:</i>	Gene expression in transgenic soybean
<i>Research Associate:</i>	Michael Burton
<i>State/Country:</i>	Nebraska/USA
<i>Expertise/Discipline:</i>	Models of patch dynamics with geo-spatial resources using geographic information systems
<i>Research Associate:</i>	Shui-Zhang Fei
<i>State/Country:</i>	China
<i>Expertise/Discipline:</i>	Buffalograss transformation
<i>Research Associate:</i>	Daniel Ginting
<i>State/Country:</i>	Minnesota/USA
<i>Expertise/Discipline:</i>	Site-specific manure application
<i>Research Associate:</i>	Delkin Orlando Gonzalez
<i>State/Country:</i>	Colombia
<i>Expertise/Discipline:</i>	Genetic dissection of mitochondrial export involving the ORF239 protein in a yeast model system
<i>Research Associate:</i>	Julie Huddle
<i>State/Country:</i>	Texas/USA
<i>Expertise/Discipline:</i>	Long-term vegetation in the Nebraska Sandhills; blowout penstemon
<i>Research Associate:</i>	Gopal Krishnan
<i>State/Country:</i>	Nebraska/USA
<i>Expertise/Discipline:</i>	Weed management in corn and soybeans
<i>Research Associate:</i>	Lijia Li
<i>State/Country:</i>	China
<i>Expertise/Discipline:</i>	Maize chromosome-specific libraries and probes
<i>Research Associate:</i>	Gilbert Meyer-Gauen
<i>State/Country:</i>	Germany
<i>Expertise/Discipline:</i>	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:* Fengang Yu  
*State/Country:* Israel  
*Expertise/Discipline:* Gene expression in transgenic soybeans

### Animal Science

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

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

### Biochemistry

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

## Biological Systems Engineering

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

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

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

## Entomology

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

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

## Plant Pathology

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

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

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

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

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

## School of Natural Resource Sciences

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



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

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

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

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

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

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

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

*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

## **Veterinary and Biomedical Sciences**

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

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

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

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

# Research Projects

**E**ach faculty member with an ARD appointment has a federally-approved research project. A number of faculty have multiple projects. There are 383 research projects that were active for all or part of the 2000-2001 fiscal year in agriculture, natural resources and family sciences. Projects are generally three to five years in duration. Faculty also are part of a national network of Agricultural Experiment Station scientists located at Land Grant Universities across the United States. ARD researchers currently are involved with about 50 regional projects in which they conduct cooperative research with

scientists at other universities, addressing problems of regional and national importance. They also participate in approximately 60 regional research committees which serve to exchange information and coordinate cooperative research activities among institutions.

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

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

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

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

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

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

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

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

**Competitive Grants:** includes research in USDA national priority areas.

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

## Agricultural/ Natural Resources Units

### Agricultural Economics

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

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

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

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

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

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

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

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

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

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

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

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

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

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

**10-143 cg**  
People, place and policy in the new 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 agrichemicals on ground water (R.F. Spalding)

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

## Animal Science

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

## Biochemistry

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

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

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

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

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

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

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

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

**15-086 ha**  
B<sub>12</sub> enzymes and hyperhomocysteinemia (R. Banerjee)

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

**15-088 ha**  
Enzymology of anaerobic CO<sub>2</sub> fixation and bioremediation (S. Ragsdale)

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

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

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

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

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

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

## Biological Systems Engineering

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

## Biometry

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

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

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

## Entomology

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

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

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

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

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

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

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

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

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

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

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

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

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

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

## Food Science and Technology

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

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

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

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

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

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

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

**16-069 ha**  
Role of proteolysis in 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 cg**  
Detecting internal insect infestation in wheat by near-infrared spectroscopy (R.L. Wehling)

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

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

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

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

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

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

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

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

## Horticulture

### 20-040 rr

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

### \*20-048 ha

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

### 20-050 ha

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

### 20-055 ha

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

### 20-056 ha

Integrated turfgrass management practices (R.C. Shearman)

### 20-057 ha

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

### 20-058 ha

Exudate physiology of grasses grown under stress environments (G.A. Horst)

### 20-059 ha

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

### 20-060 ha

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

### \*20-061 st

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

### 20-062 ha

Exploring plant nutrient interactions in floricultural and ornamental crops (E.T. Paparozzi)

### 20-063 ha

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

## Plant Pathology

### 21-012 st

Electron microscopy in agricultural research (E.M. Ball)

### 21-022 rr

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

### 21-040 ha

DNA replication and gene expression of Chlorella viruses (J.L. VanEtten)

### \*21-056 ha

Detection of seedborne bacteria and characterization of bacterial endophytes (A.K. Vidaver)

### 21-057 rr

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

### 21-058 rr

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

### \*21-061 ha

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

### 21-063 ha

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

### 21-064 rr

Fusarium mycotoxins in cereal grains (M.B. Dickman)

### 21-069 ha

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

### 21-070 ha

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

### 21-071 cg

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

### 21-072 cg

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

### 21-073 ha

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

### 21-074 st

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

### 21-075 ha

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

### 21-076 ha

Pathogenic determinants of phytopathogenic fungi (M.B. Dickman)

### 21-078 cg

Secretion properties of the type III secretion system of *Pseudomonas syringae* (J.R. Alfano)

### 21-079 ha

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

## School of Natural Resource Sciences

### 12-239 ha

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

### 26-025 ms

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

### 26-027 ha

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

### 27-003 ha

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

### \*27-004 ha

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

### 27-007 ha

Drought: response and policy implications (D.A. Wilhite)

### \*27-008 rr

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

### 27-011 ha

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

### 27-012 rr

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

### 27-016 ha

Climate change and the winter wheat agroecosystem: experiments and modeling (A. Weiss)

### 27-017 ha

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

### \*40-001 sg

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

### 40-002 ha

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

### 40-003 ha

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

### \*40-004 ha

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

### 40-005 ha

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

### 40-006 ms

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

### 40-007 ms

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

### 40-008 ha

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

### 40-010 sg

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

### 40-011 ms

Windbreak shelter effects (J.R. Brandle, L. Hodges, S. Josiah)

### 40-012 rr

Impact climate and soils on crop selection and management (K. Hubbard)

### 40-013 ha

Rapid estimation of soil hydraulic properties (J. Skopp)

## Veterinary and Biomedical Sciences

- 14-009 rr**  
Prevention and control of enteric diseases of swine (R.A. Moxley)
- 14-014 rr**  
Bovine respiratory disease (S. Srikumaran)
- 14-039 st**  
Research laboratory and animal care facility (J.A. Schmitz, A. Hogg, T.E. Socha)
- 14-059 st**  
Veterinary diagnostic lab system: diagnostic surveillance and disease investigation in Nebraska livestock and poultry (J.A. Schmitz, A.R. Doster, J.L. Johnson, D.M. Grotelueschen)
- \*14-085 rr**  
Research in support of a national eradication program for pseudorabies (F.A. Osorio)
- \*14-086 cg**  
Molecular characterization of *Pasteurella haemolytica* leukotoxin-receptor interactions (S. Srikumaran)
- \*14-091 cg**  
Molecular characterization of MHC class I down-regulation by bovine herpesvirus I (S. Srikumaran)
- 14-093 ah**  
Bovine respiratory syncytial virus glycoprotein interactions in a homologous host cell receptor (C. Kelling)
- 14-094 ah**  
Molecular characterization of animal RNA viruses and their interactions with the host (R.O. Donis)
- 14-095 ah**  
Interaction of porcine reproductive and respiratory syndrome virus and *Salmonella choleraesuis* (R.W. Wills, F.A. Osorio)
- 14-096 ah**  
Functional analysis of the BHV-1 latency related gene (C. Jones)
- 14-097 cg**  
Functional analysis of bovine herpes virus I latency related gene products (C. Jones)
- 14-098 st**  
Monitoring individual animal performance to evaluate beef cattle production and economics (G.P. Rupp, D.D. Griffin)

- 14-099 cg**  
Cis-acting elements in the replication of the bovine viral diarrhoea virus genome (R.O. Donis)
- 14-100 cg**  
Analysis of apoptosis and pathogenesis by bovine herpes virus and BICPO (C. Jones, A.R. Doster)
- 14-101 cg**  
Role of *E. coli* heat-labile enterotoxin-I in diarrhoea and septicemia in swine (R.A. Moxley, R.G. Barletta)
- 14-102 ha**  
Strategic plan for an IANR field disease research program at the Department of Veterinary and Biomedical Sciences (D.R. Smith)
- 14-103 ah**  
Pathogenic mechanisms of bacterial respiratory pathogens (J.D. Cirillo)
- 14-104 cg**  
Identification of mycobacterium paratuberculosis virulence determinants (R.G. Barletta)
- 14-105 cg**  
The effect of PRRSV on the immune system during acute and persistent infection (F.A. Osorio, F. Zuckerman, A.R. Doster)
- 14-107 ha**  
Theoretical and applied molecular biology or porcine gonadotropins (G.B. Shearman)
- 14-108 ah**  
Molecular genetic analysis of *Mycobacterium paratuberculosis* and related mycobacterial pathogens (R.G. Barletta)
- 14-109 ha**  
Epidemiology of *Escherichia coli* O157:H7 and *salmonella* in feedlot beef cattle (D.R. Smith, R.A. Moxley, L.L. Hungerford, J.T. Gray, T.J. Klopfenstein)
- 14-110 cg**  
Inhibition of apoptosis by the bovine herpes virus I latency related gene (C. Jones, A. Doster)
- 14-111 cg**  
A novel strategy to test and monitor beef feedlot food-safety control points (D. Smith, L. Hungerford, J. Gray, R. Moxley, T. Klopfenstein)
- 14-112 cg**  
GP 96 as molecular chaperone for antigen delivery in viral systems (S. Srikumaran)
- 14-113 sg**  
A workshop on epidemiologic methods and approaches to food safety (R. Wills)

- 14-114 cg**  
Role of macrophages in the pathogenesis of porcine colonic spirochetosis (G. Duhamel, J. Cirillo)
- 14-115 rr**  
Porcine reproductive and respiratory syndrome (PRRS) (F.A. Osorio, R. Wills)
- 14-116 ha**  
Geospatial analysis and animal health (L. Hungerford)

## Human Resources and Family Sciences Departments

### Family and Consumer Sciences

- \*92-020 rr**  
The role of housing in rural community vitality (E.R. Combs)
- 92-021 ha**  
Impact of Head Start on rural children, families, and communities (P.D. Zeece)
- 92-022 ha**  
Retirement economic well-being for women in Nebraska and cross-culturally (S.L. Cramer)
- 92-023 ha**  
Economic well-being of Nebraska household: a comparison of alternative measures (E.P. Davis)
- \*92-025 ha**  
Family functioning of interracially constituted families (S. Baugher)
- 92-026 ha**  
Surviving and transcending a traumatic childhood (J. DeFrain)
- 92-028 ha**  
High hopes and bright futures: successful teens in Nebraska (D.A. Abbott, W.H. Meredith)
- \*92-029 ha**  
The impact of welfare reform on women's lives: education, job placement/retention, and resource management (K. Prochaska-Cue, B. Sparks)

- 92-031 ha**  
Economic impact of HIV/AIDS on Nebraskans (M.E. Rider)
- 92-032 ha**  
The new relational perspective in developmental psychology and its applications to education and child care (C.P. Edwards)
- 92-033 ha**  
Into the heartland: a contextual examination of migration and its impacts on rural Nebraskan meat-packing communities (R.L. Dalla)
- 92-035 rr**  
Rural low-income families: monitoring their well-being and functioning in the context of welfare reform (K. Prochaska-Cue)
- 92-036 ha**  
Outcomes in the collaborative management of mental health treatment within a primary care medical setting (R.J. Bischoff)

### Nutritional Science and Dietetics

- 91-042 rr**  
Bioavailability of nutrients: a key to human nutrition (J.A. Driskell)
- 91-043 rr**  
Health maintenance aspects of dietary recommendations designed to modify lipid metabolism (N.M. Lewis)
- 91-045 rr**  
Using stages of change model to promote consumption of grains, vegetables and fruits by young adults (N.M. Betts)
- 91-046 ha**  
Exercise dependence and disordered eating behaviors: instrument development validation and testing (N.M. Betts)
- 91-047 ha**  
The metabolic basis of atherosclerosis (T.P. Carr)
- 91-048 ha**  
The use of edible films and natural antioxidants to control warmed-over flavor in meats (M. Schnepf)
- 91-049 ha**  
Nutritional knowledge, practices, beliefs of caregivers and practices of physicians for young children (K.L. Stanek)
- 91-050 ha**  
Health implications of folate and homocysteine as it relates to fruit and vegetable consumption (J.A. Albrecht)

**91-051 ha**  
Assessing managerial and work force development in foodservice management (F. Hamouz)

**91-052 cg**  
Using the stages of change model to increase fruit and vegetable intake (N. Betts)

## Textiles, Clothing and Design

**94-022 ha**  
Development of textile end-uses for wheat gluten and other farm commodity derived materials (L.E. Hamilton)

**94-023 rr**  
Development of textile materials for environmental compatibility and human health and safety (P.C. Crews)

**94-024 ha**  
Impacts of environmental disclosure policies and constraints on housing transaction practices (S. Niemeyer)

**94-025 rr**  
Development of textile materials for environmental compatibility and human health and safety (L. Scheyer)

**94-026 cg**  
Film properties of chemically modified wheat gluten binders for pigment printing (L. Scheyer)

**94-027 rr**  
Impact of technology on rural consumer access to food and fiber products (R. Kean)

## Off-Campus Research Centers

### Northeast Research and Extension Center

**42-007 ha**  
Management considerations for feedlot cattle exposed to environmental stressors (T.L. Mader, C.T. Milton)

**\*42-014 ha**  
Biology and control of the European corn borer bean leaf beetle and other selected insects in northeast Nebraska (J.F. Witkowski)

**42-017 ha**  
Determination of crop residue cover using electronic image analysis (D.P. Shelton)

**42-018 rr**  
Integrated crop management effects on stalk-boring Lepidoptera (J.F. Witkowski)

**42-022 cg**  
Dynamic responses of feedlot cattle exposed to heat stress (T.L. Mader, D.E. Spiers, J.A. Nienaber, J.L. Morrow-Tesch, A.M. Parkhurst)

**42-023 ha**  
Modifying pig performance through facility and diet management (M.C. Brumm)

**42-024 ha**  
Utilizing animal manures and fertilizers in cropping systems for northeast Nebraska (C.A. Shapiro)

**42-025 ha**  
Integrated weed management (IWM) for eastern Nebraska (S.Z. Knezevic)

**42-026 ha**  
Developing economic thresholds for insect pests of conventional and value-added crops in northeast Nebraska (T.E. Hunt)

**42-027 ha**  
Developing operational criteria for application of swine lagoon water via center pivot (W.L. Kranz)

### Panhandle Research and Extension Center

**44-004 st**  
Fertilizer and manure application for production of continuous corn (D.D. Baltensperger)

**44-016 ha**  
Weed control systems for western Nebraska irrigated crops and rangeland (R.G. Wilson)

**44-035 ha**  
Feed resources and beef production systems in western Nebraska to optimize total efficiency (I.G. Rush, B.A. Weichenthal)

**44-042 ha**  
Agricultural enhancement of potato production and utilization (A.D. Pavlista)

**44-051 ha**  
Agrichemical control in irrigation runoff water from surface irrigated fields (C.D. Yonts, R.G. Wilson)

**44-052 ha**  
The economics of alternative beef cattle marketing and feeding strategies (D.M. Feuz)

**44-053 ha**  
Machinery systems management for sugarbeets, dry edible beans, and chicory (J.A. Smith, R.G. Wilson)

**44-054 rr**  
Plant germplasm and information management and utilization (D.D. Baltensperger)

**44-055 ha**  
Intensification of winter wheat based dryland cropping systems for western Nebraska (D.J. Lyon)

**44-057 ha**  
Studies of drought and defoliation effects on range grasses needed to optimize future grazing research (P.E. Reece, W.H. Schacht, J.D. Volesky, L.E. Moser)

**44-058 ha**  
Integrated management systems for arthropod pests of wheat and other crops in western Nebraska (G.L. Hein)

**44-059 ha**  
Dynamic nitrogen management for crops grown in the high plains of Nebraska (J. Blumenthal)

**44-060 ha**  
The ecology, etiology, and management of crop diseases important to western Nebraska (R.M. Harveson)

### Roman L. Hruska U.S. Meat Animal Research Center

**46-001 st**  
Development and operation of the U.S. Meat Animal Research Center (D. Laster)

### South Central Research and Extension Center

**48-016 ha**  
Soybean production practices and alternative crops within resource-efficient cropping systems for south central Nebraska (R.W. Elmore)

**48-019 ha**  
Managing weeds and herbicides for profitable crop production and reduced environmental risks (F.W. Roeth)

**\*48-022 ha**  
Crop insect pest management in Nebraska: biological control and sampling (R.J. Wright)

**\*48-023 ha**  
Formulation of nitrogen fertilization recommendations to maximize economic and environmental goals (R.A. Selley)

**48-024 cg**  
Epidemiology and life history of *Claviceps africana* in the Great Plains (J.P. Stack)

**48-025 ha**  
Subsurface drip irrigation: Integrated water and nitrogen BMPs for corn and assessing irrigation uniformity in situ (B.L. Benham)

**48-026 ha**  
Site-specific nutrient management strategies for irrigated and non-irrigated maize (R.B. Ferguson)

**48-027 ha**  
Microbial management of plant diseases in sustainable production systems: microbial diversity, habitat receptivity, and pathogen populations (J.P. Stack)

**48-028 ha**  
Spatial distribution and sampling of field crop insects (R.J. Wright)

### West Central Research and Extension Center

**43-057 ha**  
Improving the profitability and sustainability of Sandhills beef cattle operations (R.T. Clark)

**43-058 ha**  
Biology, ecology, economics and control of major insects affecting cattle in Nebraska (J.B. Campbell)

**43-059 ha**  
Production systems and nutrition for Sandhills and Northern Great Plains range (D.C. Adams)

**43-060 rr**  
Management of arthropod pests of livestock and poultry (J.B. Campbell, G.D. Thomas)

**43-061 ha**  
Management practices to improve reproduction of beef heifers (G.H. Deutscher)



**\*43-062 ha**

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

**43-063 ha**

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

**43-065 ha**

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

**43-066 ha**

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

**43-067 ha**

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

**43-068 ha**

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

## Interdisciplinary Activities

### Administration

**01-001**

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

**01-004**

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

### Agricultural Research and Development Center

**45-001 st**

Field laboratory development (D. Duncan)

### Center for Grassland Studies

**33-001 st**

Center for grassland studies (M.A. Massengale)

**33-002 rr**

Improved grazing systems for beef cattle production (R. Clark, T.J. Klopfenstein)

## Center for Sustainable Agriculture Systems

**31-002 st**

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

**\*31-004 sg**

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

**31-005 sg**

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

## Food Processing Center

**19-003 st**

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

**\*19-004 sg**

Midwest food manufacturing alliance (S.L. Taylor)

**19-008 sg**

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

**19-009 sg**

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

**19-010 sg**

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

**19-011 sg**

Alliance for food protection (S. Hefle)

## Industrial Agricultural Products Center

**\*29-007 sg**

Industrial agricultural products center (M.A. Hanna)

**\*29-008 st**

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

**29-010 sg**

Industrial Agricultural Products Center (M.A. Hanna)

# Publications

**W**hile serving the needs of Nebraska's agricultural producers, agribusinesses, industries, communities and citizens, the ARD places a high priority on being accountable for its resources and documenting impacts of its programs. As in all research institutions, ARD scientists are charged to actively disseminate results of research in scientific journals and technical publications. The division sets optimistic, but reachable, annual goals for scientific publication, theses and dissertations, and other measures of research output. In each of the last three years the goals have been exceeded.

Publications in refereed (peer reviewed) scientific journals represent professional

acknowledgment of the value of a research finding to the discipline. ARD scientists have published in a number of different scientific journals during 2000. Faculty also have written books, edited books or contributed chapters for books.

Another major contribution of the ARD research faculty is the education of graduate students pursuing a Master of Science (M.S.) or Doctor of Philosophy (Ph.D.) degree. One responsibility of a graduate degree is the completion of a thesis (M.S.) or a dissertation (Ph.D.)

Publications in refereed journals, books, book chapters, refereed proceedings, theses and dissertations are listed for calendar year 2000.

## Journals in which faculty have published in 2000

### Agricultural Economics

Agricultural Economics  
International Journal of Water Resources Development  
Journal of Agricultural Economics  
Review of Agricultural Economics  
Rural America  
Rural Sociology  
Southern Economic Journal

### Agricultural Leadership, Education and Communication

Educational Technology  
Journal of Agricultural Education  
Journal of Psychological Type  
Leadership Quarterly  
Online Journal of Distance Learning Administration  
Psychological Reports

### Agronomy and Horticulture

African Crop Science Journal  
Agriculture, Ecosystems and Environment  
Agriculture Systems  
Agronomy Journal  
American Journal of Alternative Agriculture  
American Journal of Potato Research  
Analytical Chemistry  
Archives of Biochemistry and Biophysics  
Cereal Chemistry  
Compost Science and Utilization  
Crop Science  
Environmental Pollution  
Environmental Toxicology and Chemistry  
Euphytica  
HortScience  
International Archives of Allergy Immunology  
Journal of the American Society for Horticultural Science  
Journal of Entomological Science  
Journal of Environmental Quality  
Journal of Family and Consumer Sciences  
Journal of Hydrology  
Journal of Phytoremediation  
Journal of Plant, Cell, Tissue and Organ Culture  
Journal of Range Management  
Journal of Soil and Water Conservation  
Journal of Sustainable Agriculture  
Journal of Range Management  
Mycologia  
Online Journal of Animal Science  
Plant Science

Plant and Soil  
Soil Biology and Biochemistry  
Soil Science  
Soil Science Society of America Journal  
The Prairie Naturalist  
Transactions of the American Society of Agricultural Engineers  
Weed Science  
Weed Technology

## **Animal Science**

American Journal of Physiology  
Animal Feed Science and Technology  
Asian-Australian Journal of Animal Science  
Cell and Tissue Research  
Crop Science  
FEMS Microbiology Letters  
Journal of the American Dietetic Association  
Journal of Animal Science  
Journal of Applied Poultry Research  
Journal of Dairy Science  
Journal of Range Management  
Journal of Swine Health and Production  
Nutrition Research  
Official Journal of Japanese Society of Zootechnical Science  
Online Journal of Animal Science  
Physiological Genomics  
Poultry Science  
Theoretical and Applied Genetics

## **Biochemistry**

Archives of Biochemistry and Biophysics  
Biochemistry  
Biochimie  
Genes and Cells  
International Archives of Allergy and Immunology  
Journal of American Chemical Society  
Journal of Biological Chemistry  
Journal of Microbiology Methods  
Journal of Theoretical Biology  
Phytopathology  
Plant Physiology  
Plant Science  
Proceedings of the National Academy of Science  
Structure

## **Biological Systems Engineering**

Agricultural Systems  
Annals of Biomedical Engineering  
Applied Engineering in Agriculture  
Cereal Foods World  
Computers and Electronics in Agriculture  
Food Science Biotechnology  
Industrial Crops and Products  
Industrial Crops Production  
International Journal of Food Properties  
Journal of Agricultural Engineering Research  
Journal of Agricultural and Food Chemistry  
Journal of Food Science

## **Entomology**

Annals of Entomological Society of America  
Bulletin of Environmental Contamination and Toxicology  
Chemosphere  
Crop Science  
Entomologia Experimentalis et Applicata  
Environmental Entomology  
Florida Entomologist  
Great Plains Research  
Journal of Economic Entomology  
Journal of Entomological Science  
Journal of Insect Physiology  
Journal of Medical Entomology  
Journal of Nematology  
Molecular Phylogenetics and Evolution  
Pest Management Science  
Pesticide Biochemistry and Physiology  
Pharmaceutical Science  
Transactions of the American Society of Agricultural Engineers

## **Food Science and Technology**

Allergy  
Applied and Environmental Microbiology  
Cereal Chemistry  
Czech Journal Food Science  
HortScience  
International Archives of Allergy and Immunology  
Journal of Agricultural Engineering Research  
Journal of Bacteriology  
Journal of Chromatography  
Journal of Food Protection  
Poultry Science

## **Plant Pathology**

Archives of Virology  
Biological Control  
Crop Science  
Horticultural Science  
Journal of the American Society of Horticultural Science  
Journal of Biological Chemistry  
Journal of Molecular Evolution  
Molecular Phylogenetics and Evolution  
Mycologia  
Nature Structural Biology  
Physiological and Molecular Plant Pathology  
Phytopathology  
Plant Cell Reports  
Science  
The Plant Cell  
The Plant Journal  
Transactions of the Nebraska Academy of Sciences  
Virology

## **School of Natural Resource Sciences**

Agricultural and Forest Meteorology  
Agricultural Systems  
Agriculture, Ecosystems and Environment  
Analytical Chemistry  
Bioremediation Journal  
International Journal of Phytoremediation  
Journal of Contingencies and Crisis Management  
Journal of Entomological Science  
Journal of Climate  
Journal of Microbiological Methods  
Journal of the American Water Resources Association  
Remote Sensing of Environment  
Wildlife Society Bulletin

## **Veterinary and Biomedical Sciences**

Archives of Virology  
Infection and Immunity  
Journal of Biological Chemistry  
Journal of General Virology  
Journal of Immunology  
Journal of Virology  
Molecular and Cellular Probes  
Vaccine  
Veterinary Microbiology  
Veterinary Pathology  
Veterinary Record

## **Family and Consumer Sciences**

Cross Cultural Research  
Early Childhood Education Journal  
Journal of Family and Consumer Sciences  
Journal of Family Issues  
Journal of Sex Research

## **Nutritional Science and Dietetics**

Dairy, Food and Environmental Sanitation  
International Journal of Vitamin and Nutritional Research  
Journal of American Dietetic Association  
Journal of Animal Science  
Journal of Family and Consumer Sciences  
Journal of Food Quality  
Journal of Food Sciences  
Journal of Nutrition  
Journal of Poultry Science  
Nutrition Research  
Proceedings of the Society for Experimental Biological Medicine

## **Textiles, Clothing and Design**

Applied Engineering in Agriculture  
Journal of Family and Consumer Sciences  
Starch/Starke  
Textile Chemist and Colorist and American Dyestuff Reporter

## **Northeast Research and Extension Center**

Agriculture Ecosystems and Environment  
Asian-Australian Animal Science  
Bulletin of Environmental Contamination and Toxicology  
Journal of Animal Science  
Journal of Entomological Science  
Journal of Swine Health Production  
Transactions of the American Society of Agricultural Engineers

## **Panhandle Research and Extension Center**

American Journal of Potato Research  
Applied Engineering in Agriculture  
Crop Science  
Journal of Plant Growth Regulation  
Journal of Sugar Beet Research  
Soil Biology and Biochemistry  
Soil Science Society of America Journal  
The Bovine Practitioner  
Weed Science

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## **South Central Research and Extension Center**

Crop Science

Journal of Economic Entomology

Journal of Environmental Quality

Journal of Kansas Entomological Society

Journal of Weed Science

Pesticide Biochemistry and Physiology

## **West Central Research and Extension Center**

Australian Journal of Experimental Agriculture

Online Journal of Animal Science

Journal of Animal Science

HortScience

Journal of Range Management

Nebraska Agricultural Research Division Journal

The Prairie Nature

Weed Science

Weed Technology

# Research Publications (2000)

## Agricultural/Natural Resources Units

### Agricultural Economics

#### Journal Articles

- Filkins, R., J.C. Allen, and S. Cordes. 2000. Predicting community satisfaction among rural residents: An integrative model. *Rural Sociology* 65:72-86. (J. Series No. 12451)
- Giannakas K. and M. Fulton. 2000. The economics of coupled farm subsidies under costly and imperfect enforcement. *Agricultural Economics* 22:75-90. (J. Series No. 13328)
- Leistriz, F.L., S. Cordes, R.S. Sell, J.C. Allen, and R. Filkins. 2000. Immigrants to the Northern Great Plains: Survey results from Nebraska and North Dakota. *Rural America* 15:8-15. (J. Series No. 13166)
- Peterson, E.W.F. 2000. The design of supranational organizations for the provision of international public goods: Global environmental protection. *Review of Agricultural Economics* 22:355-369. (J. Series No. 10797)
- Peterson, E.W.F. and S.R.K. Valluru. 2000. Agricultural comparative advantage and government policy interventions. *Journal of Agricultural Economics* 51:371-387. (J. Series No. 12679)
- Schroeter, J., A. Azzam, and M. Zhang. 2000. Measuring market power in bilateral oligopoly: The wholesale market for beef. *Southern Economic Journal* 60:526-547. (J. Series No. 12676)

- Supalla, R.J. 2000. A game theoretic critique of institutional arrangements for Platte River management. *International Journal of Water Resources Development* 16:253-265. (J. Series No. 12841)

#### Refereed Proceedings

- Conley, D. 2000. Multi-year hedging analysis, 1973-98. *In: Proceedings from the International Food and Agribusiness Management Association.* [http://tamu.edu/iama/2000Congress/2000\\_forum\\_papers.htm](http://tamu.edu/iama/2000Congress/2000_forum_papers.htm).
- Dias, W. and G.A. Helmers. 2000. Nonparametric efficiency analysis of public safety production, p. 79-82. *In: Art Gowan (ed.), Proceedings of the Southeast Decision Sciences Institute, Wilmington, NC.*

- Helmers, G.A. and S. Shaik. 2000. The use of the nonparametric approach in risk-return analysis, p. 58-61. *In: Art Gowan (ed.), Proceedings of the Southeast Decision Sciences Institute, Wilmington, NC.*

- Wade, M. and D. Conley. 2000. Assessing informational bias and food safety: A matrix method approach. *In: Internal Food and Agribusiness Management Association Proceedings.* [http://tamu.edu/iama/2000Congress/2000\\_forum\\_papers.htm](http://tamu.edu/iama/2000Congress/2000_forum_papers.htm)

#### Book Chapter

- Perrin, R.K. 2000. Economic opportunities for new genetic products, chapter 2. *In: Designing Crops for Added Value, Agronomy Monograph. ASA, CSSA and SSSA, Madison, WI.*

#### Research Bulletins

- Perrin, R.K. and T. Klopfenstein. 2000. Economic impact of feeding wet grain processors' byproducts in Nebraska. *Research Bulletin* 337. University of Nebraska Agricultural Research Division.
- Perrin, R.K., J. Poor, and D. Coyne. 2000. Economic impact of the Chase variety of pinto bean. *Research Bulletin* 338. University of Nebraska Agricultural Research Division.

#### Ph.D. Dissertations

- Cole, J.D. 2000. An economic analysis of agricultural land leasing with an emphasis on the interface of leasing and conservation practices in Nebraska and South Dakota. (B.B. Johnson, Advisor)
- Matthey, H. 2000. Testing the impact of corporate farming restrictions on the Nebraska hog industry. (J.S. Royer, Advisor)
- Suksamai, A. 2000. International agricultural efficiency and productivity: A nonparametric malmquist index approach. (G.A. Helmers, Advisor)
- Roeber, R.L. 2000. A time series analysis of European wheat export refunds and world wheat prices. (E.W.F. Peterson, Advisor)

## Agricultural Leadership, Education and Communication

#### Journal Articles

- Barbuto, J.E. 2000. Influence triggers: A framework for understanding follower compliance. *Leadership Quarterly* 11:365-387. (J. Series No. 2160)
- Barbuto, J.E. 2000. Comparing leaders' ratings to targets' self-reported resistance to task assignments: An extension of Chester Barnard's zones of indifference. *Psychological Reports* 86:611-621. (J. Series No. 12944)
- Barbuto, J.E. and B. Plummer. 2000. Mental boundaries and Jung's psychological types: A profile analysis. *Journal of Psychological Type* 54:17-21. (J. Series No. 12507)
- Barbuto, J.E., S. Fritz, and D.B. Marx. 2000. A field study of two measures of work motivation for predicting leader's transformational behaviors. *Psychological Reports* 86:295-300. (J. Series No. 12807)

- Frantz, G.L. and J.W. King. 2000. The distance education learning systems model (DEL). *Education Technology* 40: 41-45. (J. Series No. 12680)
- King, J.W., G.C. Nugent, J.J. Eich, D.L. Mlinek, and E.B. Russell. 2000. A policy framework for distance education: A case study and model. *The Distance Education Online Symposium (DEOSNEWS)*. 10.10. (J. Series No. 12874) [http://www.ed.psu.edu/acsde/deos/deosnews/deosnew10\\_10.asp](http://www.ed.psu.edu/acsde/deos/deosnews/deosnew10_10.asp)
- Fritz, S., J.E. Barbuto, D.B. Marx, A. Eting, and S. Burrow. 2000. Motivation and recognition preferences of 4-H volunteers. *Journal of Agricultural Education* 41:40-49. (J. Series No. 12823)
- Rockwell, S.K., J.W. Furgason, and D.B. Marx. 2000. Research and evaluation needs for distance education: a delphi study. *Online Journal of Distance Learning Administration*. (J. Series No. 13083) <http://www.westga.edu/~distance/jmain11.html>
- Rockwell, S.K., J. Schauer, S. Fritz, and D.B. Marx. 2000. Faculty education, assistance and support needed to deliver education via distance. *Online Journal of Distance Learning Administration*. (J. Series No. 12965) <http://www.westga.edu/~distance/jmain11.html>

#### Refereed Proceedings

- Barbuto, J.E. 2000. What triggers compliance? A follower-based framework for understanding the influence process, p. 193-194. *In: M. Wollan (ed.), Proceedings of the Institute for Behavioral and Applied Management, San Diego, CA.*
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## Animal Science

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Liu, W. 2000.

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# Panhandle Research and Extension Center

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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)

# Research Expenditures

**A**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 <sup>1</sup>
Industry Grants .....	\$9,184,314

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

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

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

<sup>1</sup>\$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

<i>Expenditure Category</i>	<i>State Appropriated and Hatch Funds</i>	<i>Federal Grants</i>	<i>Industry Grants</i>	<i>Revolving Funds</i>	<i>All Funds</i>
	----- % of total within source -----				
<b>Salaries, Wages and Benefits</b>					
Faculty/Administrative	40.4	4.5	3.2	1.4	21.2
Managerial/Prof	13.7	6.1	6.7	5.7	9.8
Office/Service	11.3	4.8	9.8	14.4	10.3
Hourly Wages	0.7	2.6	4.0	2.8	1.9
GRA Stipends	5.5	16.3	14.7	2.0	8.5
Benefits	13.6	5.8	7.0	5.4	9.7
<b>Subtotal:</b>	<b>85.2</b>	<b>40.2</b>	<b>45.3</b>	<b>31.7</b>	<b>61.5</b>
<b>Operating</b>					
Supplies and Expenses	11.1	54.9	41.2	48.3	30.3
Travel	0.8	2.8	5.0	3.0	2.3
Equipment	2.9	2.1	8.4	17.0	6.0
<b>Subtotal:</b>	<b>14.8</b>	<b>59.8</b>	<b>54.7</b>	<b>68.3</b>	<b>38.5</b>
<b>Total:</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

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## Agricultural Research Division Selected Research Program Information

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Category	FY 1999	FY 2000	FY 2001
<b>Project Information:</b>			
Projects at beginning of year	368	399	383
Projects terminating	23	42	25
Projects revised	11	6	14
New projects	54	26	37
Projects at the end of the year	399	383	395
<b>Faculty full-time equivalents (FTE)</b>	129.9	130.4	130.2
<b>Expenditures for budgeted research faculty:</b>			
Federal formula and state approp., \$/FTE <sup>1</sup>	\$258,582	\$241,259	\$255,367
Grant and contracts, \$/FTE	\$135,262	\$138,217	\$158,111
Product sales, \$/FTE	\$ 51,357	\$ 52,774	\$ 76,143
<b>Outputs from research programs<sup>2</sup>:</b>			
Refereed journal articles	274	327	275
Research bulletins	2	1	4
Books and book chapters	68	45	97
M.S. and Ph.D. theses	148	115	128
Cultivars and germplasm released	13	17	18
Patents obtained	3	6	2

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<sup>1</sup>Includes cost of administration and expenditures from the Nebraska Research Initiative by ARD-affiliated faculty.

<sup>2</sup>A large number of abstracts, technical reports, and other non-refereed articles also are published by faculty each year.



A photograph of a rural landscape. A dirt road curves through a green field. In the background, there is a barn and a silo. The sky is overcast. The image has a soft, hazy quality.

**““** *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

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