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## Agricultural Research Division 119th Annual Report 2005

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The background of the entire page is a photograph of a sunset. The sky is a gradient of orange and yellow, with some clouds visible. In the foreground, the dark silhouette of a water tower is on the left, and the silhouettes of trees and bushes are along the bottom edge.

# UNIVERSITY OF NEBRASKA-LINCOLN AGRICULTURAL RESEARCH DIVISION

119th ANNUAL REPORT

JULY 1, 2004 to JUNE 30, 2005

INSTITUTE OF AGRICULTURE AND NATURAL RESOURCES



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.

The University of Nebraska–Lincoln does not discriminate based on 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.*



Z B Mayo

**T**he 119th Annual Report of the University of Nebraska–Lincoln Agricultural Research Division (ARD) is provided to inform stakeholders about the accomplishments of ARD faculty and to document progress being made to serve agriculture, agribusiness, natural resources, and human resources. This report documents accomplishments in FY 2005 that serve Nebraskans by developing new knowledge and technologies to improve profitability, better manage natural resources, enhance environmental quality, and improve the quality of life.

In addition to research accomplishments and impacts, this report includes a listing of faculty, research projects, faculty and student awards and honors, research outputs and the ARD financial report for the period July 1, 2004, to June 30, 2005. This report was compiled in accordance with the intent of the law of the State of Nebraska that established the Nebraska Agricultural Experiment Station on March 31, 1887.

The *Research Highlights* section outlines some of the significant accomplishments of our faculty. Some of the accomplishments include:

- Health-conscious parents who feed their young children the same low-fat diet they consume for better health may inadvertently deprive their children of vitamin E, an important nutrient for growing bodies.
- UNL has developed commercial turf buffalograsses tolerant to low mowing height and resistant to drought.
- Understanding the physiological mechanisms of aphid damage holds promise of developing better resistant cultivars.
- Undergrads collaborate on ARD research.
- Process for developing replacement heifers to lighter-than-traditional weight reduces costs and does not hurt reproductive performance.
- Ozone effectively decontaminates soils containing explosives residues.
- Transgenic soybean rich in omega-3 fatty acid provides important nutritional benefits and potential value-added markets.
- Proof that refined soy oil is safe for allergic consumers is good news for the soybean industry and food processors, as well as consumers.
- Research is developing a better understanding of education barriers for rural immigrants.
- Silvopasturing studies are aimed at developing programs that effectively combine trees, forage plants or crops with livestock production.

The above items are only a few of the many important research findings by ARD scientists. ARD research is serving both science and society, and making a difference in the economy of the state and the lives of Nebraskans.

Z B Mayo  
Interim Dean and Director  
Agricultural Research Division

**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 tool aids crop decisions when water restricted

Nebraska irrigators facing limited water supplies have a new tool to help them make better-informed cropping decisions.

The Water Optimizer, a decision-support computer program developed by IANR researchers, became available to farmers in 2005.

A biological systems engineer and an agricultural economist designed the tool in response to continued drought, water limits and policies that restrict water use in parts of Nebraska.

Water Optimizer helps farmers maximize their profits by helping them sort out how best to use their limited irrigation water. They can evaluate whether it would be most profitable to grow different crops, irrigate fewer acres, apply less water

to existing crops or go to dryland farming.

The tool evaluates single fields for several crop options. Irrigated crops include: corn, soybeans, sorghum, wheat, alfalfa, edible beans and sunflowers. Dryland crops include: corn, soybeans, sorghum, sunflowers, alfalfa and wheat in continuous summer fallow and eco-fallow rotations.

Growers load information such as the amount of water available, soil type, irrigation system type and fuel type for irrigation into a spreadsheet. They also enter their production costs, irrigation costs, crop prices and crop type.

The program uses this individualized information to calculate the crops that will be most profitable with the given costs and available water.

The program lets growers weigh and compare different options on a computer screen. By running "what if" scenarios, they can see the relative payoffs of different choices.

Other potential uses of the program include comparing management strategies such as profit-maximizing deficit irrigation, fixed crop rotations, single- and multi-year full irrigation strategies, or Environmental Quality Incentives Program or Conservation Reserve Enhancement Program leasing.

The Water Optimizer tool is available on the Web at <http://extension-water.unl.edu/> or on a DVD/CD set.

## Quantifying impact of attack on nation's grain marketing

A terrorist attack on the nation's grain marketing infrastructure could mean major losses in U.S. grain exports.

That's the conclusion of a UNL agricultural economist who analyzed the impact of grain handling disruptions at the Port of New Orleans, which handles up to three-quarters of U.S. corn exports. This work is part of ongoing multi-state research quantifying economic ramifications of a terrorist attack on the nation's grain marketing system.

The IANR study found that a moderate to medium disruption at this critical port would result in a \$600 million to \$900 million annual loss in export value.

Researchers developed a database to project economic impacts of terrorist attack scenarios that reduced the Port of New Orleans' corn export volume by 10 percent, 15 percent and 25 percent for a year. Analysis was based on three-year average cash corn prices and grain movements from 1997 through 1999.

The database showed no change in the U.S. export market from the 10 percent reduction; a 15 percent disruption would cut U.S. corn export sales by 1 percent.

The real change came with a 25 percent loss export volume at New Orleans.

That conservatively would cost the United States \$600 million per year in lost exports.

Researchers found reductions beyond 25 percent would require a major change in world corn markets. The United States is the world's leading corn exporter. Ultimately, global demand for corn probably couldn't be met if U.S. exports dropped more than 25 percent.

This research provides information for national security officials who must plan for possible terrorist events. Findings also offered insights into the potential



The Water Optimizer, a decision-support computer program developed by IANR researchers, helps farmers sort out how best to use their irrigation water.



economic losses caused by Hurricane Katrina's disruption of grain exports at port.

## Soy oil findings help shape food allergen labeling laws

UNL soybean oil research is influencing food allergen labeling laws here and abroad.

An international study by IANR food scientists confirmed that highly refined soybean oil does not cause reactions in people who are allergic to soybeans. Soy-allergic people don't react because refined oil contains only minuscule amounts of protein, the culprit in allergic reactions. Findings do not apply to cold- or expeller-pressed soy oil, which contains more protein and may cause reactions.

The study has drawn interest internationally from allergic consumers, food manufacturers and farmers as well as regulators because soybeans are a common allergen and soy oil is used extensively in foods worldwide.

Scientists in the university's Food Allergy Research and Resource Program shared their findings with policy-makers, congressional staffers, industry and the leading consumer group for allergic consumers.

The Nebraska findings played a role in European Union food allergen labeling decisions in 2005 as well as the U.S. Food Allergen Labeling and Consumer Protection Act of 2004, which Congress passed to protect allergic consumers.

Highly refined soybean oil was among the soy components that the European Union temporarily exempted from food allergen labeling regulations. Industry included UNL's findings in a successful

request for a three-year temporary exemption.

Earlier, U.S. regulators exempted highly refined vegetable oils derived from known allergens, such as soybeans or peanuts, from the new federal food allergen labeling law that takes effect in 2006. Nebraska's research contributed to the scientific evidence for that decision.

As a result, ingredient labels on foods containing soy oil need not explicitly list soy oil. Instead, labels can read "soybean, canola or safflower oil."

These decisions help preserve soybean growers' widest possible access to the world's markets.

## Feedlot heat stress research saves producers millions

Widespread adoption of IANR-developed strategies for reducing heat stress in feedlot cattle is saving the region's cattle industry millions annually in cattle deaths and performance losses.

In the past decade, at least five summer heat waves killed feedlot cattle and reduced feedlot cattle performance in Nebraska. During this time, extensive research by animal scientists at the university's Northeast Research and Extension Center/Haskell Agricultural Laboratory at Concord expanded understanding of the nature of heat waves' impact on cattle. Scientists developed management strategies that reduce heat stress in cattle and an extensive UNL Extension education effort helped producers adopt these preventive measures.

In the 2005 heat wave alone, this effort saved the

region's cattle industry between \$10 million and \$27 million, thanks to widespread adoption of these IANR-developed strategies. This estimate of economic impact

is based on information collected about the heat waves' severity and the number of cattle on feed at the time.

This analysis showed a steady decline in the percentage of feedlot cattle that died during the most severe heat waves of 1995, 1999 and 2005. Cattle deaths as a percent of those on feed dropped from 2.32 percent in 1995 to 1.25 percent in 1999 and to 0.61 percent in 2005. The 1995 heat wave was slightly more severe and occurred before research results were available. Death and performance losses declined as more producers adopted prevention strategies during the decade.

The 1.71 percent decline in death loss between the 1995 and 2005 heat waves represents a savings of more than \$27 million. The 0.64 percent decline in death loss between 1999 and 2005 heat waves of similar magnitude represents more than \$10 million in savings.

## Field trials providing info to combat soybean rust

Soybean rust is a major new disease worry for growers nationwide. UNL plant pathologists are studying this threat to ensure Nebraska farmers have information and resources to combat rust if it strikes the state.



Thirteen field trials across Nebraska during the 2005 growing season examined various aspects of fungicide application and efficacy. Researchers also are studying how planting and maturity dates and soybean varieties influence the disease. IANR plant pathologists will use these preliminary results and future field trials to devise an integrated soybean rust management program for Nebraska growers.

IANR's product performance trials examined fungicide application timing, techniques and rates as well as chemigation, the application of fungicide through center pivot irrigation systems. Since soybean rust hadn't made its way to Nebraska, researchers evaluated and treated another common foliar disease of soybean, brown spot, to collect data.

Findings will provide practical, science-based information growers and companies can use to decide whether chemigation is a good way to apply foliar fungicides to treat soybean rust. They're also looking at the economic feasibility of different treatments.

If soybean rust develops in Nebraska, scientists don't think it will require treatment every year. That's why it's important to understand the role planting and maturity dates and different varieties play in disease control. This information will help researchers devise an integrated manage-





ment program to control the disease and reduce the need for fungicides.

Much of Nebraska's research is conducted in collaboration with the North Central Soybean Research Program. Results of trials and research findings are posted on the university's soybean rust Web site, [soybeanrust.unl.edu](http://soybeanrust.unl.edu), as soon as possible so growers can access the latest information.

## Cattle grazing influences bird nesting in Sandhills

When it comes to bird-nesting success in Nebraska's Sandhills, the number of cattle grazing a pasture can be more important than the type of grazing system being used, UNL School of Natural Resources research found.

In the three-year study of cattle's impact on bird nesting, wildlife ecologists compared different grazing schemes – season-long and short- and medium-length rotations – to determine which provide the bird habitat. Findings are providing insights about how best to manage grazing to optimize benefits for cattle and birds.

Scientists initially thought rotational grazing would give birds the best chance at nesting success because cattle would be in a given area for a short time before being

moved elsewhere. Rotations would allow vegetation to regrow to varying heights, creating more habitat diversity.

However, this IANR study found stocking rates – the number of cattle introduced into any grazing system – most strongly influence grazing intensity and nesting success.

Stocking rates can vary widely within the same type of grazing system as ranchers make decisions within their own ranch. Scientists say that may explain why they didn't see big differences in nesting success among different systems.

Nesting was most productive regardless of the grazing regime when land had a chance to rest. Management-intensive pastures didn't always have more bird species. While it might seem that pastures grazed season-long would have fewer species and less nesting success, this IANR study found that no one system favored high species diversity.

Findings indicate a mix of grazing approaches within a region would provide the greatest habitat diversity. Scientists now are focusing on small-scale changes within pastures to determine how grazing pressures within different systems affect birds.

## Initiative increases UNL expertise in water research

Water is one of Nebraska's leading resources. A new initiative is strengthening UNL scientists' ability to explore and understand this vital resource and positioning UNL as a water research and education leader.

The Water Resources Research Initiative aims to

enhance and expand UNL's water research by promoting greater collaboration between scientists with diverse water expertise and bolstering the university's water research capacity. Launched in late 2003, the initiative already is beginning to pay off. This effort includes numerous departments and colleges. IANR researchers play key roles in this effort.

UNL has formed collaborative teams of scientists with diverse expertise, hired additional researchers in key areas, developed comprehensive research proposals and is increasing cooperation with water-focused federal and state agencies. In 2005, the initiative was named one of 11 Programs of Excellence at UNL.

Seven new researchers were hired in 2005 to strengthen UNL's hand in water law, water quality, water chemistry, water economics, surface and river ecology and climate modeling. They complement the university's traditional strengths in groundwater hydrology, water quality, drought mitigation, climate change, irrigation, remote sensing and geographic information systems.

The initiative is helping scientists better compete for federal funds to address issues such as contaminated soil, groundwater and surface water as well as launch an economic study of drought-depressed Lake McConaughy and participate in the Platte River Cooperative Hydrology Study. Graduate and undergraduate water, policy and law programs also are expanding to help train tomorrow's water scientists and policy-makers.

This multi-disciplinary focus is enabling UNL scientists to tackle complex water-related issues facing Nebraskans and provide

information needed for wise water management. In an era of increasing concern about and competition for water, their findings also will benefit the Great Plains and the nation.

## Demand growing for IANR's improved buffalograsses

Demand for UNL's water-thrifty turf-type buffalograsses is increasing nationwide as people look for more sustainable turf options.

IANR-developed turf buffalograsses are showing up in lawns, golf courses, roadways and parks coast to coast. Demand is greatest in water-short areas such as the West; interest is increasing in eastern states and even abroad.

These improved buffalograsses are the result of long-running IANR research to provide environmentally friendlier turf. Buffalograss requires up to 50 percent less water than Kentucky bluegrass, far less mowing and fertilization, and grows in poor soils.

Thanks to careful breeding and selection, Nebraska's turf buffalograsses retain their prairie ancestors' toughness, but with looks suited for lawns. Improved buffalograsses generally are denser, darker green and keep their



Buffalograss test plots at the Agricultural Research and Development Center near Mead.

color longer than traditional buffalograss.

Since 1990, nine turf buffalograsses developed by IANR turf scientists have been commercialized for sale to the public or the turf industry. Private companies in Nebraska and elsewhere grow and sell these improved buffalograsses as seed, sod or plugs under licensing agreements with the university. Royalties from buffalograss sales have earned the university about \$1.1 million since 1990. Royalties help fund ongoing research.

IANR turf scientists were among the first to examine buffalograsses' turf potential. Before Nebraska's research began in 1984, turf nationwide research focused on non-native grasses; buffalograss was primarily considered pasture grass. Today, UNL is the nation's leader in turf buffalograss research.

## Lighter weight replacement heifers can cut feed costs

Feed is the single biggest cost in cow-calf operations. New UNL research indicates producers can save on feed by developing replacement heifers to lighter than traditional weights.

Typically, ranchers equate lighter weight replacement heifers with poor pregnancy rates and calving difficulty. However, IANR animal science research shows replacement heifers can be developed to a lighter-than-traditional weight without hurting reproductive performance.

The study found no problems in developing spring-born heifers to 53 percent of mature breeding weight



Beef reproductive physiologist, Rick Funston, studied lighter weight replacement heifers.

compared with 58 percent. Traditionally, ranchers develop replacement heifers to 60 percent or 65 percent of mature weight. This lighter approach significantly reduces costs for developing heifers from fall weaning until the following summer's breeding season.

Feeding heifers to 53 percent of mature weight costs about \$22 per head less during the development period than feeding to traditional replacement weights. In a 500-cow operation with 15 percent of heifers replaced annually, that represents a \$1,650 annual savings.

In this three-year study at the university's Gudmundsen Sandhills Laboratory near Whitman, heifers reached 53 percent or 58 percent of the weight of a mature 1,200-pound cow at the beginning of the breeding season. The two weight groups had similar average calf birth dates, weights and calving difficulties.

There also was no difference between the two weight groups in the percentage of cows that successfully rebred for their critical second pregnancy. Researchers tracked lighter heifers through their fourth pregnancy and found no problems. The heifers remained at lighter than traditional weights as mature cows.

## Undergrads and scientists team on research efforts

Some undergraduates get hands-on research experience working with IANR scientists on studies that tackle issues important to Nebraskans.

UNL's Agricultural Research Division's Honors Student Research program funds selected research by undergraduates who work closely with IANR researchers. The students' studies let them apply their classroom learning to real-world scientific problems and experience discovery firsthand. Scientists say students' findings contribute to ongoing research programs. For example:

Beef producers and the environment should benefit from an animal science student's study of phosphorus levels in cattle bones. She worked with IANR animal scientists who are examining cattle's need for this essential nutrient. Results indicate cattle have plenty of phosphorous and don't need supplemental phosphorus. Findings should help producers reduce supplement costs and excess phosphorus in manure.

Cattle feeders are already using results of an agribusiness student's research.

Working with an IANR agricultural economist, he surveyed Nebraska feedyards, compared employee variables such as wages, education and benefit packages, and calculated industry averages that feedlot managers can use in hiring decisions. His findings are detailed in a UNL Extension publication the pair authored.

A veterinary science undergrad's research on West Nile Virus in horses should lead to better diagnoses for the state's horse industry. Her findings suggest some horses with West Nile symptoms may have had prior exposure to the virus from an earlier infection or a vaccination to prevent the disease. The IANR veterinary scientist who advised her said this work will improve the accuracy of diagnoses.

## Insights about antibiotics' fate in soil

Applying manure to cropland enriches soil and puts waste to good use. Today's manure may contain traces of antibiotics used in livestock production and there's growing interest in knowing what happens to antibiotics in the environment.

Scientists know relatively little about the fate of antibiotics in soil. To find out, IANR agricultural scientists teamed with a USDA Agricultural Research Service researcher at UNL and others on field studies at the West Central Research and Extension Center at North Platte.

Manure from confined cattle fed the recommended dose of oxytetracycline, an antibiotic commonly used in rations, was applied to irrigated corn plots at UNL recommended or twice the





To learn more about what happens to antibiotic residues after livestock manure is applied to fertilize cropland, IANR scientists conducted field studies at the university's West Central Research and Extension Center at North Platte. Agronomist David Tarkalson draws a water sample from an irrigated corn test plot.

recommended rates. Scientists sampled soil at different depths and tested water from the bottom of 8-foot sealed columns of soil, called lysimeters.

Traces of oxytetracycline were detected in topsoil for 17 months after manure application. Levels decreased over time and the antibiotic was undetectable after 18 months. Two years of testing found no oxytetracycline in water collected 8 feet under test plots.

Manured plots contained significantly more tetracycline-resistant bacteria in topsoil than commercially fertilized plots for five months after application. Levels declined over time with no difference than commercially fertilized plots after five months. Further study is needed to determine whether the increase in resistant bacteria originates in the manure or develops in natural soil bacteria.

This research provided one of the first overviews of what happens when manure is applied to irrigated cropland. There's much more to learn but these findings lay the scientific foundation for further studies to better understand potential health and environmental implications.

## Ozone cleans soil contaminated with explosives

Soil around former bomb-making plants often is contaminated with toxic compounds that can pollute groundwater and public drinking water. Conventional soil clean up methods are expensive.

An IANR soil environmental chemist and graduate student found ozone effectively cleans carbon-based explosives residues, such

as RDX and TNT, from soil. Injecting ozone into soil as a fumigant turns the contaminants into harmless carbon dioxide. Lab tests on soil from a Texas bomb plant site show ozone can be 100 percent effective at eliminating carbon-based residues.

Scientists are perfecting their technique for use with existing technology and equipment to pump ozone through the soil on a large scale.

Ozone injection should be simpler and less expensive than conventional soil clean-up methods that involve digging up, removing and incinerating soil.

## Many preschool children short on key vitamins

Getting enough key vitamins is important to good health, especially for young children whose bodies are growing. Low-fat diets that many adults favor may leave children short on key fat-soluble vitamins, IANR research indicates.

A UNL nutrition scientist reached that conclusion after studying preschool-age children in four Lincoln, Neb., day care centers. She launched her study to evaluate the National Academy of Sciences' dietary recommendation for vitamin E in children. She found these recommendations are appropriate.

Her study also revealed that two-thirds of these 2- to 5-year-olds don't consume enough vitamin E and one-third don't get enough vitamin C. Interviews with parents about their children's dietary intake indicated that young children who share their parents' low-fat

diet may get inadequate vitamin E. Children deficient in either vitamin came equally from all ethnicities, genders and ages.

Based on this research, she recommends children regularly consume whole milk, nuts and seeds, regular salad dressings and whole-grain cereals fortified with vitamins plus plenty of citrus fruits and juices for vitamin C. Parents may also want to talk with their physician about whether their young children should take a multi-vitamin/multi-mineral supplement.

This College of Education and Human Sciences study highlights the importance of preparing healthy snacks and meals that provide adequate vitamins to meet children's needs. Parents and day care providers can use this information to ensure children are consuming enough vitamins.

The researcher is expanding her study to include more children, especially in rural areas.

## New Sandhills facilities will aid IANR research

Buildings completed in 2005 at UNL research facilities in the Sandhills significantly expand IANR research and educational capabilities.

The 9,100-square-foot Wagonhammer Education Center, dedicated in August at the Gudmundsen Sandhills Laboratory near Whitman, accommodates 300 people plus research and teaching space for faculty and graduate students. The main auditorium, named the Ray Bohy Conference Room, commemorates Bohy's 30



years' service to the university and IANR.

Two gifts – the first in 2001 from Elaine Wolf of Albion and her husband, James, who died in 2002, the other from Bohy – made the center possible. The Wolf family owns Wagonhammer Cattle Co.

Gudmundsen is the site of a variety of range, beef, soils, entomology, ecology, geology, hydrology and wildlife research. The center will enhance research and extension efforts.

The new Barta Brothers Ranch Research Facility near Long Pine is a two-story, 4,800-square-foot building. It will aid research by providing a meeting room for up to 30 people and dormitory space for researchers working at the ranch.

The building, including a full kitchen and living room, makes research at the ranch easier for scientists who previously had to travel 30 miles to the nearest hotel. It has four bedrooms upstairs to accommodate 12 people with room for an additional bedroom downstairs that could accommodate four others.

The ranch is named after brothers Clifford and James Barta who gave their 6,000-acre ranch to the University of Nebraska Foundation in 1996. The brothers also provided an estate gift to establish the Barta Brothers Fund, a permanent endowment for ongoing support of agriculture research.

Long-term research is the focus at Barta Brothers, including grazing systems, integrated resource management and Sandhills biodiversity. The ranch is also the site for demonstrating best management practices.

## Research provides info to help turn crops into fuel

Producing ethanol and biodiesel from Nebraska corn and soybeans provides renewable fuel for Nebraskans and expands markets for the state's corn and soybeans.



UNL agricultural research is providing scientific, technical and economic information to help turn Nebraska's crops into biofuels. For example:

IANR researchers analyzed diverse aspects of Nebraska's ethanol production – from feedlot and corn price economics to the impact of ethanol expansion on the state's agriculture and Nebraska's comparative advantage in ethanol production. They reported their findings at a legislative briefing. Their analysis shows Nebraska's ethanol production costs are about the same as in Iowa but are 5 percent to 6 percent lower than in Illinois and Indiana. Nebraska's cattle feeding industry contributes to this advantage by providing a ready market for ethanol byproducts.

A study by the university's Industrial Agricultural Products Center helped pinpoint the best soy biodiesel and ethanol blends for combining with petroleum diesel to create biodiesel when using both renewable fuels. This research showed the optimal combination is 20

percent soy biodiesel, 4 percent ethanol and 76 percent petroleum diesel.

IANR animal scientists' ongoing research on feeding ethanol byproducts to cattle is paying off for cattle producers and ethanol plants alike. Their earlier work demonstrated the feasibility, benefits and economic advantages of feeding byproducts wet instead of dry. It's estimated that feeding wet byproducts saves cattle feeders \$10 to \$20 per head. Selling byproducts wet instead of dry also reduces ethanol production costs about 5 percent.

Other IANR biofuels-related research includes quantifying modern ethanol's positive energy balance, evaluating the economic benefits of ethanol production, genetically engineering soybeans to enhance their biofuels use and exploring the feasibility of producing biodiesel in Nebraska.

## Soybeans packed with beneficial omega-3 in the works

Wild salmon, tuna and sardines are among the foods rich in omega-3 fatty acid, which is touted for its role in preventing heart disease, cancer and other ailments. However, many Americans don't get enough of this beneficial fat in their diets.

IANR plant scientists are working to create soybeans rich in omega-3. It's part of broader research to modify soybean DNA and produce beans with enhanced nutritional or other characteristics.

They aim to develop soybeans high in omega-3 that could be fed to farm-raised fish or poultry to boost the



**Plant Scientist Tom Clemente** inspects a transgenic soybean plant in the greenhouse. Clemente's team uses biotechnology to develop soybeans rich in omega-3 fatty acid.

amount of this important fatty acid in their meat. Consumers who eat the meat from fish or animals fed these enriched soybeans could improve their nutrition without changing their eating habits.

Researchers have already identified genes from other plants, inserted these genes in soybean cells and produced plants high in gamma-linolenic acid and stearidonic acid, the building blocks for omega-3. Next they hope to transfer genes from a harmless plant fungus into cells from these soybeans to induce production of omega-3.

They also are field testing the new genetically modified soybeans to ensure they yield well before proceeding to that next, more difficult step. It's likely to take about a decade to develop soybeans high in omega-3 for commercial use. These specialty beans also could bring a premium for growers.

## Probing clues to reproductive development

There's mounting scientific evidence that what happens during fetal development affects fertility in adult humans and animals. Genetic, environmental, nutritional and other factors influence reproductive potential.

While scientists know how some of the genes function, they don't have a good overall picture of everything involved. A UNL animal scientist is working on a piece of this complex puzzle.

She's examining how vascular, or blood vessel, development influences overall development of the testicles and ovaries. This is basic research but understanding the genetic underpinnings of gonadal development eventually could lead to therapies for infertility.

Findings so far indicate blood vessel development plays a significant role in overall gonadal development. IANR researchers are focusing on a gene that produces a hormone, vascular endothelial growth factor, or VEGF.

When IANR researchers inhibited the hormone's ability to communicate with cells, they blocked formation of blood vessels in what would become testicles. This also blocked development of the structures necessary to make sperm.

This research showed that cells that make up the blood vessels migrate from adjacent tissue to the developing testes to form blood cells. Researchers also found VEGF in precursor and mature sperm cells, which indicates the hormone has a role in sperm development

beyond blood vessel formation.

Reproductive problems are a growing concern. For example, 40 percent of adult men in industrialized countries have below normal sperm counts and the incidence of testicular cancer in men under age 20 is increasing at an alarming rate.

This work should aid a broader scientific effort to understand and someday treat the underlying causes of fertility problems.

## Exploring subsurface drip irrigation's potential

Going underground with irrigation could help farmers in water-short areas make the most of every drop.

Subsurface drip irrigation, or SDI, is the most water-thrifty system available but little is known about whether it's practical or feasible for Nebraska growers. New IANR research should answer these and other questions in the coming years. Preliminary results point to major water savings without sacrificing yields.

IANR researchers installed subsurface drip systems at the South Central Agricultural Laboratory near Clay Center in 2004, the Panhandle Research and Extension Center at Scottsbluff in 2003, and at the West Central Research and Extension Center at North Platte



Subsurface drip irrigation being installed at the West Central Research and Extension Center.

in 2003 and 2005. Findings will provide information on SDI's potential with central and western Nebraska soils, crops and farming practices.

SDI delivers water to the crop root zone drop by drop through plastic tubing buried 12-15 inches below the soil surface, virtually eliminating water loss on the soil surface. It also should boost nitrogen efficiency by spoon-feeding fertilizer to crops as needed.

IANR researchers are studying crop water use, performance and yields response, water savings and nitrogen use efficiency. They also want to examine weed-crop competition for water, insect management, economic implications and how different crops and varieties respond.

First-year results from 2004 at Clay Center found similar yields for corn that received 10.3 inches, 7.7 inches and 5 inches of water through SDI. Yields were 225, 225 and 210 bushels per acre, respectively. This indicates using SDI could reduce water needs without hurting yields.

Future research also needs to address rodent damage to the plastic pipes, system maintenance and the economic feasibility of switching to SDI.

## Entomologists' findings could cut aphid damage

Aphid is the most damaging crop pest worldwide but exactly how they harm plants has remained a puzzle. IANR entomologists are piecing together answers that could lead to better control.

Aphid damage causes plants to yellow. Scientists long thought aphids produced a toxin that damaged plant chloroplasts, where photosynthesis happens. But no toxin had been found.

IANR entomologists closely studied aphid-infested plants over time and before the tell-tale yellowing that signals aphid damage. This early inspection revealed abnormalities before visible signs of injury emerged and provided unseen other clues.

They also used fluorometry, which measures plants' energy status. The combination of early inspection and fluorometry revealed that aphids block energy from leaving the chloroplasts. It is a build up of molecules excited by this energy – not a toxin – that eventually chews up the cells and causes visible damage.

The discovery seems to hold true for most types of aphids. It points to the potential for a single solution to reduce losses across a variety of crops and aphid species.

While most plants are damaged by aphids, some are resistant. IANR entomologists now are exploring genes they believe have key roles in protecting resistant plants from aphid damage. If they pinpoint these protective genes and show they are more active in resistant plants during aphid infestations, the genes could be used to develop crops that survive aphid damage.

Creating plants that withstand aphids is a better solution than killing the insects. Over time, insects can develop resistance to chemical controls. Allowing aphids to feed on but not kill the plant maintains a natural balance.

## Glimpses at ARD Research

- ◆ IANR scientists were among the most-cited worldwide in agricultural research over the last decade, according to a report that tracks the research that captures the interest of scientists globally. The ISI Essential Science Indicators Report, 1994-2004, indexed nearly 9,000 journals, tracking how often articles are cited by other authors. The report reviewed agricultural sciences articles published by 298 government institutions and large universities worldwide. UNL ranked eighth among U.S. universities, 10th among universities worldwide and 16th among all institutions. This report is an indication of the high quality of IANR research and its value to expanding scientific knowledge worldwide.
  - ◆ A new test that quickly detects traces of soy flour is helping food processors better protect consumers with food allergies. It's the latest of several food allergen rapid detection tests developed by IANR food scientists. All are commercially available to the food industry through a university licensing agreement with Neogen, a Michigan company. The UNL team earlier devised tests for peanuts, milk, eggs, almonds and wheat gluten. A test for hazelnuts could be commercialized in the next year. Tests give processors a quick, reliable way to detect traces of an allergenic food on equipment or in foods processed on shared equipment. People with food allergies are safer thanks to these tests, which give processors
- the tools to check for allergen contamination so it doesn't reach consumers.

  - ◆ Inaccurate seed placement takes a big bite out of yields at harvest. UNL biological systems engineers are working to improve planter accuracy by identifying the most important factors in putting seeds in just the right spot. They found that seed tubes play a key role and that wear on sugar beet planter seed tubes can significantly change seed placement. This research also indicates seed coatings can affect seed placement. Some coatings make the seed smoother while others don't affect the texture. This work is helping sugar beet growers fine-tune planters' accuracy.
  - ◆ Rural immigrants furthering their education while working face many challenges. College of Education and Human Sciences researchers hope to improve the chances of success by identifying what helps or hinders rural immigrants' educational pursuits. This study of bilingual Latinos in Northeast Nebraska pursuing online classes at UNL showed significant family or community support and access to child care are keys to success. Participants with more support and those who were more integrated into their communities reported less stress and depression. These results and further research should help provide better services for rural immigrants and women seeking an education.
  - ◆ The latest generation of decorative millets from UNL plant breeding efforts will debut in garden centers in 2006. The two
- newcomers – showy hybrids of pearl millet – are named Jester and Purple Baron. Ball Horticultural, a plant and seed wholesaler, will sell seed and young plants to the commercial greenhouse industry under a university licensing agreement. Both come from similar breeding lines as Purple Majesty, UNL's popular decorative millet that now grows in gardens worldwide.

  - ◆ Government policies designed to encourage soil conservation also contain components that sometimes may lead to noncompliance, IANR agricultural economics research shows. While most producers comply, costs associated with soil conservation programs have led some producers to collect payments without complying. Under current policy, penalties for noncompliance equal the government payment, creating economic incentives for producers to falsely claim government payments. This research showed the extent of non-compliance and the level of conservation practice adoption depend on the size of the government payment, costs associated with adoption of practices, and level of government oversight and enforcement. Noncompliance can be completely deterred if the expected penalty exceeds costs of program adoption.
  - ◆ Combining trees for harvest with grass for grazing could help producers make the most of the land and resources. An IANR range scientist and a plant stress physiologist are examining how different forage grasses perform under different amounts of shade
- from green ash and scotch pines. Their findings should help producers interested in silvopasturing, which combines trees, grasses or crops with livestock grazing.

  - ◆ Hot, humid weather during the breeding season hurts beef cow reproduction, IANR research shows. In general, scientists found that conception rates drop 1 percent for each 1 degree Fahrenheit that breeding season temperatures are above normal. In Nebraska, a major beef producing state with roughly 2 million cows, a 1 percent drop in conception amounts to \$12 million in lost income for cow-calf producers if weaned calves bring \$600. Findings point to potentially significant consequences for producers if global warming increases average temperatures. This study, the first to quantify the relationship between environmental conditions and beef cow reproduction under typical pasture breeding conditions, shed light on this largely hidden production cost.
  - ◆ Child care, transportation and health care are just a few things rural women worry about regardless of income. As part of a national study on welfare reform and rural women, IANR family scientists studied 42 rural Nebraska women of all incomes. They found that while 80 percent of the women reported being employed, many go in and out of the work force because of transportation and child care issues. This College of Education and Human Sciences research will provide information to help policy-makers better understand rural needs.



# 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

**Konstantinos Giannakas** was an expert consultant on Domestic Support Measures at the United Nations' Food and Agriculture Organization (FAO) in Rome, Italy, and was appointed Associate Editor, *American Journal of Agricultural Economics*.

**Gary Lynne** was a member of the Carbon Sequestration Team that received the IANR Team Award and was an invited review panel member for the National Science Foundation.

## Agronomy and Horticulture

**Kenneth G. Cassman** received the International Fertilizer Association's International Crop Nutrition Award.

**Achim R. Dobermann** received the Fellow Award from the American Society of Agronomy.

**John Doran** received the Distinguished Service Award from the Soil Science Society of America.

**Jerry Eastin** received the Sorghum Industry Award from the Nebraska Grain Sorghum Producers Association and the Nebraska Grain Sorghum Board.

**Bahman Eghball** received the Agronomy Fellow Award from the American Society of Agronomy.

**Richard B. Ferguson** received the Water Guardian of the Year Award from the Nebraska Agri-Business Association, Inc.

**Dale Flowerday** received the Dr. Ray Starostka Award of Excellence and was named Nebraska's Certified Crop Adviser of the Year.

**Sally A. Mackenzie** was named Fellow of the American Association for the Advancement of Science.

**Martha Mamo** received the IANR Dinsdale Family Faculty Award.

**Martin Massengale** was inducted into the new USDA Cooperative State Research, Education and Extension Service Hall of Fame; was reappointed by the U.S. Secretary of Agriculture to a third term on the Agricultural Research, Extension, Education and Economics Advisory Board; and received the "Brothers of the Century" award from Alpha Gamma Rho Fraternity.

**Patrick E. Reece, Walter H. Schacht, and Jerry Volesky** were members of Cow-Calf and Forage Systems in the Nebraska Sandhills research team that received the IANR Team Award.

**James E. Specht** received a Charles Bessey Professorship.

**Gary Varvel** received the ASA Fellow Award.

The **Carbon Sequestration Team** received the IANR Team Award. Agronomy and Horticulture Department team members include **Brigid Amos, Tim Arkebauer, Kenneth G. Cassman, Achim Dobermann, Daniel Ginting, Daniel Walters, and Haishun Yang.**

## Animal Science

**Michael Brumm** received the Excellence in Research Award from the Nebraska Chapter of Gamma Sigma Delta.

**Chris Calkins** was a member of the research team that received the Prize for Meat Science and Technology from the International Meat Secretariat; received the Omtvedt Innovation Award and was reappointed to the Nebraska Cattle Industry Professorship.

**Larry Cundiff** was a member of the research team named to *BEEF* magazine's Top 40 who have contributed to building today's beef industry.

**Andrea Cupp** received the Junior Faculty Excellence in Research Award from the Agricultural Research Division.

**Charles Hibberd** received the Award of Merit from the Nebraska Chapter of Gamma Sigma Delta.

**Thomas Jenkins** received the Pioneer Award from the Beef Improvement Federation.

**Rodger Johnson** received the Omtvedt Innovation Award from the Institute of Agriculture and Natural Resources.

**Steven Jones** was a member of the research team that received the Prize for Meat Science and Technology from the International Meat Secretariat and received the Omtvedt Innovation Award from the Institute of Agriculture and Natural Resources.

**Terry Klopfenstein** received the Secretary's Honor Award from the U.S. Department of Agriculture, was named a Distinguished Honorary Member of the Mexican Association of Animal Production, and received the College of Food, Agricultural and Environmental Sciences Distinguished Alumni Award from The Ohio State University.

**Robert Koch** was a member of the research team named to *BEEF* magazine's Top 40 who have contributed to building today's beef industry.



ARD Dean and Director Darrell Nelson (right) presents a Junior Faculty Excellence in Research Award to Andrea Cupp, Department of Animal Science.

**Terry Mader** received the Wendell Burgher Beef Industry Award/Professorship from the Institute of Agriculture and Natural Resources and was named an Honorary Professor in the School of Animal Studies at the University of Queensland, Australia.

**Merlyn Nielsen** was elected secretary-treasurer of the Midwest Section of the American Society of Animal Science.

**Ivan Rush** received the Prime Promoter Award from the Nebraska Beef Council.

**Sheila Scheideler** received the Omtvedt Innovation Award from the Institute of Agriculture and Natural Resources.

**Dale Van Vleck** was named the A.B. Chapman Lecturer in Animal Breeding and Genetics at the University of Wisconsin-Madison.

## Biochemistry

**Ruma Banerjee** received the George Holmes University Professor award from the University of Nebraska-Lincoln.

**Donald Becker** received the Junior Faculty for Excellence in Research award from the Agricultural Research Division.

**Raymond Chollet** was elected AAAS Fellow / Sections of Biological Sciences and Agriculture at its national meeting.

**John Markwell** received the Holling Family Award for Teaching Excellence from the Holling Family and the Excellence in Education Award from the Beta Theta Pi Fraternity.

**Robert Spreitzer** received the Charles Bessey Professor award from the University of Nebraska.

## Biological Systems Engineering

**Derrel Martin** was a member of the Carbon Sequestration Program team that received the Team Award from the Institute of Agriculture and Natural Resources.

**Wayne Woldt** received a Blue Ribbon Award from the American Society of Agricultural Engineers for Educational Aids.

## Entomology

**Tiffany M. Heng-Moss** received the Omtvedt Innovation Award from the Institute of Agriculture and Natural Resources.

**Leon G. Higley** received a BCE Educational Project Award for the ESCAPE Website at the North Central Branch Entomological Society of America meeting.

**W. Wyatt Hoback** received a BCE Educational Project Award for the ESCAPE Website at the North Central Branch Entomological Society of America meeting.

**Shripat T. Kamble** was presented the C.V. Riley Achievement Award at the North Central Branch Entomological Society of America meeting.

**Z B Mayo** is Chairperson of the Academic Rights and Responsibilities Committee.

**Brett C. Ratcliffe** is serving as Secretary of the Coleopterists Society.

**Robert J. Wright** was elected to the Academic Senate and served as the Entomological Society of America Poster Chair.

## Food Science and Technology

**Sue Hefle** received the Fellow Award from the American Academy of Allergy, Asthma, and Immunology and the Fellow Award from the Institute of Food Technologists.

**David S. Jackson** received the Best Paper Award from the Tortilla Industry Association.

## School of Natural Resources

**Tala Awada** received the award of Fellow and Member of the Board of Governors, Center for Great Plains Studies, University of Nebraska-Lincoln.

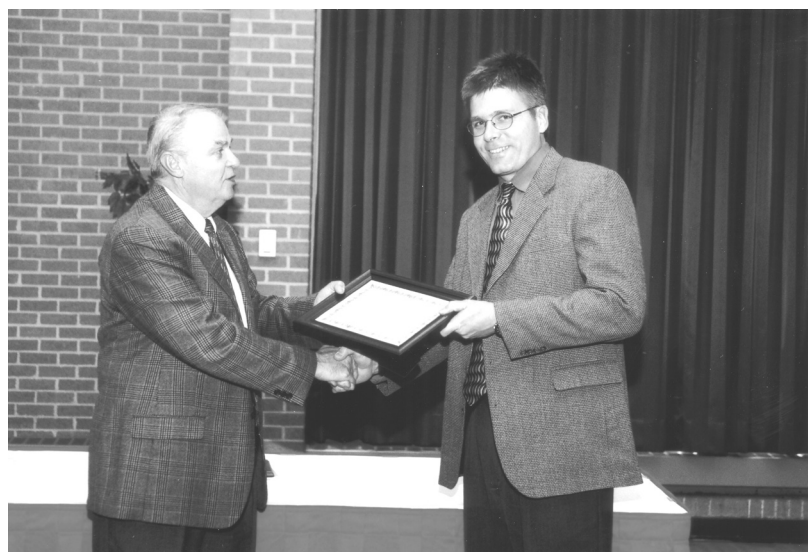
**James W. Merchant** was honored with the MidAmerica GIS Consortium (MAGIC) Lifetime Achievement Award at the Ninth Biennial MidAmerica GIS Symposium.

**Shashi B. Verma** was a member of the Carbon Sequestration Program team that received the Team Award from the Institute of Agriculture and Natural Resources; co-authored a journal article that received the Norbert Gerbier-Mumm International Award (World Meteorological Organization) for the Paper of the Year and was selected as a Fellow of the American Society of Agronomy.

## Veterinary and Biomedical Sciences

**Dicky Dee Griffin** received the American Association of Bovine Practitioner's Award of Excellence from the Veterinary and Biomedical Sciences Department.

**Marjorie Lou** received an Adjunct Professorship from China Medical University, Shenyang, China, and received the Kwan-Biao Distinguished Professorship from Zhejiang University, Hangzhou, China. She has also received a Certification of Recognition for Contributions to Students from the University of Nebraska-Lincoln.



ARD Dean and Director Darrell Nelson (left) presents a Junior Faculty Excellence in Research Award to Donald Becker, Department of Biochemistry.

## Family and Consumer Sciences

**Rochelle Dalla** received the Award for Young Achievers from the College of Education and Life Sciences at the University of Arizona.

## Northeast Research and Extension Center

**Mike Brumm** received the Research Award from the University of Nebraska chapter of Gamma Sigma Delta.

**Thomas Hunt** received the National Entomological Society of America Special Project Award, a Board Certified Entomologists team award.

**Terry Mader** received the Wendell Burgher Industry Professorship and was named Honorary Professor in the School of Animal Studies, University of Queensland, Brisbane Australia.

## Panhandle Research and Extension Center

**David Baltensperger** received the Outstanding Achievement Award from the Nebraska Wheat Growers Association.

**Linda Boeckner** received the Extension Award from the Nebraska Chapter of Gamma Sigma Delta.

**Charles A. Hibberd** received the Award of Merit from the Nebraska Chapter of Gamma Sigma Delta.

**H. Doak Nickerson** received the Honor Award from the Nebraska Chapter of the Soil and Water Conservation Society and the Master Angler Award from the Nebraska Game and Parks Commission.

**Ivan G. Rush** received the Prime Beef Promoter in Nebraska Award from the Nebraska Beef Council.

**Dean Yonts** received the Water Guardian Award from the Mid-America Croplife Association.

## West Central Research and Extension Center

**Dale Lindgren** received the Honorary Membership Award from the Nebraska Nursery and Landscape Association; a Certificate of Appreciation for 25 years as a cooperator from the NC-7 Regional Ornamental Plant Trials; and Distinguished Service Award from the Nebraska Cooperative Extension Association Specialist Section.



# 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 813 graduate students are pursuing advanced degrees with ARD faculty. The quality of our graduate students is reflected in the recognition they receive.

## Agricultural Economics

**Brahim Bouras** received the Dr. James B. Hassler Award for Outstanding Research by a Graduate Student, Department of Agricultural Economics.

**Kyriakos Drivas** received the Outstanding M.S. Student Award from the Department of Agricultural Economics.

**Scott Nedved** received the Outstanding MBA Agribusiness Student Award.

**Gibson Nene** received the CAFIO, Department of Agricultural Economics Graduate Student Research Travel Award.

**Dimitrios Panagioutou** received the CAFIO, Department of Agricultural Economics Graduate Student Research Travel Award.

**Alejandro Plastina** received the Outstanding Ph.D. Student Award from the Department of Agricultural Economics, University of Nebraska–Lincoln; CAFIO, Department of Agricultural Economics, Graduate Student Research Travel Award; and the Graduate Student Organization, Department of Agricultural Economics Fellow Graduate Student Award.

**Cody Wietzenkamp** received the SAMBA, University of Nebraska Fellow Graduate Student Award.

## Agronomy and Horticulture

**Arlene Adviento-Borbe** received the Moseman Fellowship from the Agricultural Research Division.

**Keri Andersen** received the STARS Fellowship from Graduate Studies.

**Fufa Birru** received the Gerald O. Mott Meritorious Graduate Student Award in Crop Science.

**Neal Bryan** received the Othmer Fellowship from Graduate Studies.

**Julian Chaky** received the Chancellor's Doctoral Fellowship from Graduate Studies.

**Veronica Ciganda** received the Milton Mohr Fellowship from the Center for Biotechnology.

**Douglas Felter** received the Henry M. Beachell Fellowship from the Department of Agronomy and Horticulture.

**M. Susana Grigera** received the Widaman Trust Distinguished Graduate Assistant Award from the Agricultural Research Division.

**Osman Gulsen** received the Presidential Fellowship from Graduate Studies and the Milton Mohr Fellowship from the Center for Biotechnology.

**Paul Hodgen** received the Milton Mohr Fellowship from the College of Agricultural Sciences and Natural Resources.

**Johan Marquardt** received the Arthur William Sampson Fellowship from the Center for Grassland Studies.

**Eric Mousel** received the W.R. Chapline Fellowship from the Center for Grassland Studies.

**Stephen Oipyo** received a Travel Fellowship Award from the International Society for Computational Biology.

**J. Andrés Quincke** received the John W. McDonald Fellowship from the Graduate College and the J. Fielding Reed PPI Fellowship from the Potash & Phosphate Institute.

lowship from the Potash & Phosphate Institute.

**Tri Setiyono** received the Henry M. Beachell Fellowship from the Department of Agronomy and Horticulture.

**Fernando Solari** received the Outstanding Graduate Student Award from the North Central Extension Industry Soil Fertility Conference.

**Aaron Waltz** received the Widaman Trust Distinguished Graduate Assistant Award from the Agricultural Research Division.

## Animal Science

**Jared Bates** received a Charles C. Cooper/Emma I. Sharpless Fellowship from the College of Agricultural Sciences and Natural Resources.

**Eric Behlke** received a Graduate Recruiting Fellowship from the College of Graduate Studies.

**Joshua Benton** received a William G. Whitmore Travel Grant from the Agricultural Research Division.

**Rebecca Bott** received the 1st Place Award in the M.S. Graduate Student Paper Competition at the Annual Meeting of the Midwest Section of the American Society of Animal Science, the 1st Place Award in the Graduate Student Paper Competition of the Nebraska Physiological Society Annual Meeting, a Milton E. Mohr Fellowship from the Center for Biotechnology, and the John W. McDonald Fellowship from the College of Graduate Studies.

**Virgil Bremer** received a Mary and Charles C. Cooper/Emma I. Sharpless Fellowship from the College of Agricultural Sciences and Natural Resources.

**Brad Creamer** received the Folsom Distinguished Master's Thesis Award from the University of Nebraska-Lincoln.

**Oscar Esquivel** received a V.H. Arthaud Travel Award from the Animal Science Department and a William G. Whitmore Travel Grant from the Agricultural Research Division.

**Danilo Franco** received an Award of Excellence for his poster at the Southern Poultry Science Society meeting.

**Bobbi Geisert** received a William G. Whitmore Travel Grant from the Agricultural Research Division.

**Kristin Gustad** received a Graduate Recruiting Fellowship from the College of Graduate Studies.

**Kimberly Hargrave** received the Maude Hammond Fling Fellowship from the College of Graduate Studies, a William G. Whitmore Travel Grant from the Agricultural Research Division, and a V.H. Arthaud Travel Award from the Animal Science Department.

**Mohammad Jalal** received an Award of Excellence for his poster presentation at the Southern Poultry Science Society meeting.

**Jennie James** received a Chancellor's Fellowship from the College of Graduate Studies and a Fellowship from the Institute of Food Technologists.

**Pablo Loza** received the 4th Place Award in the Graduate Student Paper Competition at the Plains Nutrition Conference and a V.H. Arthaud Travel Award from the Animal Science Department.

**Matt Luebbe** received a William G. Whitmore Travel Grant from the Agricultural Research Division.

**Jessica Meisinger** was elected the Midwest Representative of the Student Board of Directors of the American Meat Science Association.

**David Monsalve** received the Victor Henningsen, Sr. Graduate Student Fellowship from the Food Science and Technology Department and a William G. Whitmore Travel Grant from the Agricultural Research Division.

**Roman Moreno** received the Ned S. and Esther B. Raun International Graduate Fellowship from the Animal Science Department.

**Sarah Morris** received a William G. Whitmore Travel Grant from the Agricultural Research Division.

**Don Moss** received a Travel Award to attend the Reciprocal Meat Conference from the American Meat Science Association.

**Robert Peterson** received the 2nd Place Award in the Ph.D. Graduate Student Paper Competition at the Annual Meeting of the Midwest Section of the American Society of Animal Science and received the 3rd Place Award in the Graduate Student Paper Competition at the Plains Nutrition Conference.

**Stephanie Quinn** received a Graduate Recruiting Fellowship from the College of Graduate Studies.

**Juliati Rahajeng** received a William G. Whitmore Travel Grant from the Agricultural Research Division.

**Angel Rios-Utrera** received the Ned S. and Esther B. Raun International Graduate Fellowship from the Animal Science Department, the Frank Baker Memorial Essay Contest from the Beef Improvement Federation, and a William G. Whitmore Travel Grant from the Agricultural Research Division.

**Ana Ruiz** received a William G. Whitmore Travel Grant from the Agricultural Research Division.

**Kristi Sayer** received a William G. Whitmore Travel Grant from the Agricultural Research Division.

**Jason Scheffler** received a Bukey Fellowship from the College of Graduate Studies.

**Aaron Stalker** received the John Hallman Memorial Award from the Animal Science Department and a William G. Whitmore Travel Grant from the Agricultural Research Division.

**Robin Ten Broeck** received a Graduate Recruiting Fellowship from the College of Graduate Studies and a William G. Whitmore Travel Grant from the Agricultural Research Division.

**April Tepfer** received a Graduate Recruiting Fellowship from the College of Graduate Studies.

## Biochemistry

**David Adle** received the Milton Mohr Graduate Student Fellowship from the Center for Biotechnology and the Hazel V. Emley Fellowship from the Office of Graduate Studies.

**Carmen Ghersiam** received the Holling Family Award for Teaching Excellence from the College of Agricultural Sciences and Natural Resources.

**Melissa Lucas** received the Othmer Fellowship from the Office of Graduate Studies.

**Peter Madzellan** received the RBC Fellowship from the Redox Biology Center.

**Elizabeth Pierce** received the RBC Fellowship from the Redox Biology Center.

**Anna Prudova** received an assistantship from the American Heart Association.

**Devis Sinani** received an assistantship from The Nutricia Research Foundation in the Netherlands.

**Dan Su** received the Widaman Trust Graduate Assistant Award from the Agricultural Research Division.

**Olga Vitvitskaia** received the Chancellor's Fellowship from the Office of Graduate Studies.

## Biological Systems Engineering

**Alejandro Amezcuita** received the V. Duane Rath Foundation Graduate Research Fellowship from the International Association of Food Industry Suppliers.

**Justin Cermak** received the Melville H. Cohee Student Leader Conservation Scholarship from the Soil and Water Conservation Society.

**Junjie Guan** received the Bill and Rita Stout Outstanding International Graduate Student Award and a John and Louise Skala Fellowship Award from the Agricultural Research Division.

**Ajay Kumar** received a John and Louise Skala Fellowship Award from the Agricultural Research Division.

**Balaji Sethuranasamyraja** received a Widaman Trust Distinguished Graduate Assistant Award from the Agricultural Research Division.

## Entomology

**Nicholas Aliano** received a Hazel V. Emley Fellowship from the Office of Graduate Studies, a Ward A. and Helen W. Combs Scholarship from the Entomology Department, 1st Place in the Student Paper Competition at the American Bee Research Conference, 1st Place in the B.S./M.S. Student Poster Competition at the North Central Branch Entomological Society of America Meeting, a scholarship from the Foundation for the Preservation of Honey Bees, and a Farmers National Company Fellowship from the College of Agricultural Sciences and Natural Resources.

**William Allgeier** received 3rd Place in the Poster Competition at the Central State Entomological Society's 80th Annual Meeting and a Myron H. Swenk Memorial Fund Travel Award from the Bruner Club Executive Committee.

**Wyatt Anderson** received a Ward A. and Helen W. Combs Scholarship from the Entomology Department, the Graduate Student Teaching Award of Merit from the North American Colleges and Teachers of Agriculture (NACTA) and the Entomology Department, and 1st Place in the B.S./M.S. Student Oral Presentations Competition at the North Central Branch Entomological Society of America Meeting.

**Laura Campbell** received the Mabel J. Reichenbach Fellowship from the Office of Graduate Studies and a Myron H. Swenk Memorial Fund Travel Award from the Bruner Club Executive Committee.

**Pete Clark** received a Milton E. Mohr Fellowship from the Center for Biotechnology and a Myron H. Swenk Memorial Fund Travel Award from the Bruner Club Executive Committee.

**André Crespo** received a Mary and Charles C. Cooper/Emma I. Sharpless Fellowship from the College of Agricultural Sciences and Natural Resources.

**Thomas Eickhoff** received a David and Anna Larrick Student Travel Award from the Agricultural Research Division, an Elvis Dickason Memorial Fund Travel Award from the Bruner Club Executive Committee, and served as the Entomological Society of America Student Affairs Committee Chair.

**Lisa Franzen** received a John Borrison Fellowship from the Office of Graduate Studies, 2nd Place in the M.S. Student Poster Competition at the National Entomological Society of America Meeting, a Myron H. Swenk Memorial Fund Travel Award from the Bruner Club Executive Committee, and won the Biological and Agricultural Sciences Division of the Sigma Xi Student Research Poster Competition.

**Shauna Hawkins** received a Myron H. Swenk Memorial Fund Travel Award from the Bruner Club Executive Committee, a travel grant from the School of Biological Sciences' Initiative for Ecology and Evolutionary Analysis, a David and Anna Larrick Student Travel Award from the Agricultural Research Division, and an Ernst Myer Travel Grant from the Museum of Comparative Zoology at Harvard.

**Timothy Huntington** received a John W. McDonald Fellowship from the Office of Graduate Studies, 1st Place in the B.S./M.S. Student Oral Presentations competition at the North Central Branch Entomological Society of America Meeting, and a Myron H. Swenk Memorial Fund Travel Award from the Bruner Club Executive Committee.

**Timothy Husen** received a Ward A. and Helen W. Combs Scholarship from the Entomology Department.

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

**Diana Londoño** received a Myron H. Swenk Memorial Fund Travel Award from the Bruner Club Executive Committee.

**Paula Macedo** received a John Borrison Fellowship from the Office of Graduate Studies and a Myron H. Swenk Memorial Fund Travel Award from the Bruner Club Executive Committee.

**Sasi Maliphan** received a Myron H. Swenk Memorial Fund Travel Award from the Bruner Club Executive Committee.

**Paul Nabity** received a Farmers National Company Fellowship from the College of Agricultural Sciences and Natural Resources.

**Matthew Paulsen** received a research grant from the Center for Great Plains Studies and a research grant and a travel award from the School of Biological Sciences' Initiative for Ecology and Evolutionary Analysis.

**Eliseu Pereira** received a fellowship from the Coordination for the Improvement of Higher Education Personnel of the Brazilian Ministry of Education and 1st Place in the Ph.D. Student Poster Competition at the North Central Branch Entomological Society of America Meeting.



**Obdulia Segura-Leon** received 2nd Place in the Ph.D. Student Poster Competition at the National Entomological Society of America Meeting and a Myron H. Swenk Memorial Fund Travel Award from the Bruner Club Executive Committee.

**Neil Spomer** received a Myron H. Swenk Memorial Fund Travel Award from the Bruner Club Executive Committee, a Fred Clute Memorial Scholarship, and 1st Place in the B.S./M.S. Student Poster Competition at the North Central Branch Entomological Society of America Meeting.

## Food Science and Technology

**Alejandro Amezcuita** received the V. Duane Rath Foundation Graduate Research Fellowship from the International Association of Food Industry Suppliers.

## School of Natural Resources

**Kirsten M. de Beurs** received a NASA Earth System Science Fellowship for her research project, Climate Change or Institutional Change? On Changes in Land Surface Phenologies in Central and Northern Eurasia.

**Charles Frost** received a Graduate Student Grant-in-Aid from the Boone and Crockett Club.

**Russell Otto** received a Graduate Student Fellowship from the Berryman Institute for Wildlife Damage Management.

## Veterinary and Biomedical Sciences

**Somashekarappa Nanjappa** received the Milton E. Mohr Scholarship from the Center for Biotechnology.

**Dhammika Navartha** received the Charles C. Cooper/Emma I. Sharpless Fellowship from the College of Agricultural Sciences and Natural Resources and the Agricultural Research Division and the William G. Whitmore Memorial Research Travel Fund from the Agricultural Research Division.

**Aruna Ambagala** received the Graduate Student Research Assistant Award from the Office of the Dean of Graduate Studies and the Best Seminar Award for the Ph.D. Program from the Department of Veterinary and Biomedical Sciences.

**Rohana Dassanayake** received the William G. Whitmore Memorial Travel Fund Award from the Agricultural Research Division and the Susan Ann Smith Mills Award from the Department of Veterinary and Biomedical Sciences.

**Yuko Mori** received the Graduate Women in Science Organization's Outstanding Woman in Science Award from the College of Agricultural Sciences and Natural Resources.

**Vicki Geiser** received the Kirschstein National Research Service Award from the National Institutes of Health.

**Katherine Holt** received the Charles Yount Scholarship from the Department of Veterinary and Biomedical Sciences.

**Harpreet Kaur Chahal** received the Best Seminar Award for the M.S. Program from the Department of Veterinary and Biomedical Sciences.

## Family and Consumer Sciences

**Lisa Garcia** received the Larson Minority Fellowship from the College of Education and Human Sciences.

**Amanda Garrett** received the Alan and Pauline Christensen Plantz Fellowship from the College of Education and Human Sciences.

## Northeast Research and Extension Center

**Justin Cermak** received the Melville H. Cohee Student Leader Conservation Scholarship from the Soil and Water Conservation Society.

**Jeff Krumm** was awarded the Entomology Department Dow AgroSciences Internship.

**Rebecca Graham** received the Mildred F. Thompson Fellowship from the College of Education and Human Sciences.

**Bea Harris** received the Graduate Teaching Assistant Award from the College of Education and Human Sciences.

**Genc Janaqi** received the Dorothea Pond Dunham Fellowship from the College of Education and Human Sciences.

**Angela Meza** received the Dorothea Pond Dunham Fellowship from the College of Education and Human Sciences.

**Nicole Prusa** received the Dorothea Pond Dunham Fellowship from the College of Education and Human Sciences.

## West Central Research and Extension Center

**Aaron Stalker** received the John and Louise Skala Fellowship award from the Agricultural Research Division, the John Hallman Memorial Award from the Department of Animal Science and the Colorado Nutrition Roundtable Graduate Student Poster Competition.

# Undergraduate Honors Student Research Program

**T**he purpose of this 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

**Chandra Ruff** received an Honors Award for "Promoting sustainable development: An analysis of the timber industries in Brazil and Indonesia using the Solow growth model," from the Agricultural Research Division. (E.W. Peterson, Advisor)

## Agronomy and Horticulture

**John Krohn** received an Honors Award for "Yield Gap Analysis of Maize in a High-Yield Production Environment Using a Simulation Model" from the Agricultural Research Division. (K. Cassman, Advisor)

**Ryan Pekarek** received an Honors Award for "A Study in the Ability of Forcing Technology to Disinfest *Corylus spp.* Hybrid Explants" from the Agricultural Research Division. (P. Read, Advisor)

## Animal Science

**Melissa Senf** received an Honors Award for "Analysis of Behavior of Squirrel Monkeys in Single vs Mixed Species Exhibits at Henry Doorly Zoo" from the Agricultural Research Division. (M.M. Beck, Advisor)

**Natalie Hart** received an Honors Award for "The Effects of Overexpression and Degradation of Hyaluronan on Follicular and Vascular Development in the Perinatal Rate Ovarian Model" from the Agricultural Research Division. (A.S. Cupp, Advisor)

## Biochemistry

**Brady Brabec** received an Honors Award for "Characterization of Basic Residues Near the Active Site in CO Dehydrogenase" from the Agricultural Research Division. (R. Banerjee, Advisor)

**Jesse Cox** received an Honors Award for "Understanding the Function and Role of MCTR2, A Mammalian Copper Transporter" from the Agricultural Research Division. (J. Lee, Advisor)

**Joshua Thoendel** received an Honors Award for "Analysis of Post-Translational Modifications in Ribulose-1, 5-Biphosphosphate Carboxylase/Oxygenase via Biochemical and Genetic Methods" from the Agricultural Research Division. (R. Spreitzer, Advisor)

## Biological Systems Engineering

**Hajira Ahmad** received an Honors Award for "Acoustic Coupling Media for Ultrasonic Investigation of Teeth" from the Agricultural Research Division. (G.R. Bashford, Advisor)

## Veterinary and Biomedical Sciences

**Holly Samson** received an Honors Award for her Undergraduate Research Project from the Agricultural Research Division.

**Nathan Heidbrink** received an Outstanding NU Pre-Vet Club Student Organization Member Award from the Agricultural Research Division.

**Amy Messinger** received an Outstanding NU Pre-Vet Club Student Organization Member Award from the Agricultural Research Division.

**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 2004-05.

Agronomy and Horticulture Department

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

**Germplasm Release:** Germplasm N584 – N591

**Scientists:** I.M. Dweikat, J.F. Rajewski, J.D. Eastin, and F.Z. Garcia

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

**Characteristics:** Eight large seeded grain sorghum germplasms were developed to produce large seeded food grade hybrid parent lines adapted to Midwest USA region. These germplasms resulted from crosses made using genetic male steriles (*ms3ms3*) and emasculated 2-way and 3-way crosses made in the 2000 spring

greenhouse between Nebraska Seed Size Cycle 5 (NSSC5) population selections and large seed size tropical introductions and conversion lines IS 9987, IS 2389, PI 571344, NSL 83547, and SC 425. NSSC5 is a Nebraska broad genetic base, full season, food grade, random mating population containing B and R reaction for A1 cytoplasmic male sterility and contains the nuclear male sterility gene *ms3*. In general these germplasms are average to short in height and medium to late in maturity. When grown at Lincoln in 2003, seed size ranged from 41-59 g/1000 seed, which was 30-88% larger than RTx430. Grain color is white, cream yellow, or yellow endosperm. Seven germplasms have tan plant reaction and one has purple plant color. Tillering habit is upright for all the germplasms except N586, which has angled tiller habit and recurved peduncles. All the eight germplasm are photoperiod insensitive. Insect and disease resistance of these germplasms has not been determined.

**Crop:** Grain Pearl Millet (*Pennisetum glaucum* spp. *monodii*)

**Germplasm Release:** Germplasm Line NPM-8

**Scientists:** J.F. Rajewski, D.J. Andrews, and I.M. Dweikat

**Released by:** The Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln

**Characteristics:** NPM-8 provides an adapted germplasm source from which dwarf lines with long panicles can be derived for use in the A<sub>1</sub> and A<sub>4</sub> cms systems as R<sub>1</sub>-lines (male parents) or A<sub>4</sub>-lines (kernels parents) for producing medium maturing dwarf grain hybrids. NPM-8 was derived from the Nigerian Dwarf Composite (NCD2) germplasm by selection of dwarf phenotypes adapted to eastern Nebraska conditions and primarily represents pooled diversity from Nigerian and West African long panicle landraces converted to a dwarf plant background. NPM-8 is a dwarf, medium maturing, tillering germplasm that averages between 98-123 cm height at maturity. It flowers between 57 and 66 days after early June to early July plantings at Mead, and has a 5-10 day range between first plants flowering and average flowering dates for the germplasm. Grain yields



	from 1620 to 2910 kg/ha have been recorded. Hybrids with 3 seed parents showed heterosis levels of 40 to 158% among 3 planting dates, with a best hybrid yield of 4709 kg/ha. Kernels of NPM-8 are gray in color, variable in shape with a size range of 4.8-11.3 g/1000. Panicles vary from 24-45 cm length and 1.7-2.5 cm diameter and have good exertion. Insect and disease reaction of NPM-8 has not been determined.	species. As such, they are a valuable genetic resource for the study of the effects of genetic drift and selection.
<b>Crop:</b>	Corn ( <i>Zea mays</i> L.)	<b>Crop:</b> Barley ( <i>Hordeum vulgare</i> L.)
<b>Germplasm Release:</b>	12 Maize Populations NB[S1]1_8, NB[S1]2_8, NB[S1]3_8, NB[RFS]1_8, NB[RFS]2_8, NB[RFS]3_8, NS[S1]1_8, NS[S1]2_8, NS[S1]3_8, NS[RFS1]1_8, NS[RFS1]2_8, NS[RFS1]3_8	<b>Variety Release:</b> P-713 Winter Feed Barley
<b>Scientists:</b>	The late W.A. Compton, M. Aguilar-Sanmiguel, D. Galusha, K. Hill, B. Johnson, S. Kaeppler, and W. Russell	<b>Scientists:</b> P.S. Baenziger, B. Behrens, K. Kim, J. McNeill, L. Oberthur, T. Berke
<b>Released by:</b>	The Institute of Agriculture and Natural Resources, University of Nebraska–Lincoln	<b>Released by:</b> The Nebraska Agricultural Experiment Station, University of Nebraska–Lincoln
<b>Characteristics:</b>	All 12 populations were developed from a long-term selection study that was initiated and conducted by the late William A. Compton. Evaluations of these cycle 8 populations were conducted as part of three thesis research projects. Each population was developed from a selection study initiated in 1968. There were two base populations, NB_0 and NS_0. Each population was independently improved by two methods of selection, per se testing of S1 families [S1] and testing of reciprocal full-sib families [RFS]. In addition, for each base population and selection method, there were three independent replicates. This resulted in 12 populations at each cycle of selection; eight cycles were completed. The selection criterion for all the populations was a multiplicative index that equaled grain yield at 15.5% moisture x (100 - % lodged plants) x (100 - % plants with dropped ears). Across replicates, both methods of selection resulted in significant changes of both grain yield and index values in the crosses between the reciprocal populations and in the first generation selfed of each population but not in the populations per se. These 12 populations are the only known populations developed from replicated selection experiments of a cultivated crop or domesticated animal	<b>Characteristics:</b> P-713 was previously tested at NE95713. P-713 is an F <sub>3</sub> -derived line that was selected in the F <sub>4</sub> generation on the basis of its maturity, plant height, straw strength, and winter hardiness. It was released on the basis of its superior winter hardiness, straw strength, and grain yield under rainfed conditions. It has rough awns, and its covered kernels are amber, have long rachilla hairs and a yellowish aleurone. The flag leaf is twisted in the late boot stage. The plant has a prostrate growth habit. It is green in color with green auricles. The spike is medium lax and medium in length. In 17 trials grown in Nebraska (1998-2003), P-713 yielded 4290 lbs/a (4810 kg/ha). P-713 is moderately resistant to powdery mildew (incited by <i>Erysiphe graminis</i> DC. f. sp. <i>Hordei</i> Em. Marchal and to barley yellow dwarf virus (BYDV) and is moderately susceptible to leaf rust (incited by <i>Puccinia hordei</i> G. Otth) and net blotch (incited by <i>Pyrenophora teres</i> f. sp. <i>teres</i> Drechs.). P-713 is best adapted to dryland production in Nebraska and the southern Great Plains.
		<b>Crop:</b> Barley ( <i>Hordeum vulgare</i> L.)
		<b>Variety Release:</b> 'Burton' Spring Feed Barley
		<b>Scientists:</b> P. Bregitzer and D. Mornhinweg
		<b>Released by:</b> United States Department of Agriculture, Idaho Agricultural Experiment Station, University of Idaho, Colorado Agricultural Experiment Station, Colorado State University, Nebraska Agricultural Experiment Station, University of Nebraska, New Mexico Agricultural Experiment Station, New Mexico State University
		<b>Characteristics:</b> 'Burton' (P.I. 634714) is a Russian wheat aphid-resistant two-rowed spring feed barley variety and has the pedigree

Baronesse/3/Crystal/2/Klages\*3/PI 366450. Burton is a spring, 2-rowed, hulled barley with a semi-lax spike that nods at maturity. Awns are long and rough. Rachilla hairs are long. Hairs on glumes are banded and glume awns are rough. Hulls are wrinkled, with prominent, barbless lateral veins. Kernels have a transverse crease at the base. Aleurone is white. Comparisons to Baronesse over 31 location years in the absence of significant Russian wheat aphid infestations show Burton to be similar with respect to maturity, height, yield, test weight, and percentage plump kernels; it has shown superior resistance to lodging. Burton is highly resistant to damage caused by Russian wheat aphid feeding. The mechanism of resistance is tolerance. The proposed name is after Bob Burton (deceased, USDA-ARS), who was instrumental in organizing and implementing the USDA-ARS Russian wheat aphid research program.

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

**Variety Name:** 'Antelope'

**Scientists:** R.A. Graybosch, C.J. Peterson, P.S. Baenziger, L.A. Nelson, B.B. Beecher, D.D. Baltensperger, J.M. Krall

**Released by:** United States Department of Agriculture, Nebraska Agricultural Experiment Station, University of Nebraska, Wyoming Agricultural Experiment Station, University of Wyoming

**Characteristics:** 'Antelope' was derived from the cross 'Pronhorn'/'Arlin' in 1993. It is white awned and white-glumed. Grain samples were classified as hard white, with color characteristics acceptable for this class. Antelope contains approximately 0.1% hard red grain and also contains tall off-types at a frequency of approximately 0.5%. Sprouting tolerance is less than that of Nuplains; hence, it is recommended for cultivation only west of the 100<sup>th</sup> meridian. Antelope has a short coleoptile. It reaches heading 1-2 days earlier than Arapahoe. Antelope carries an unknown leaf rust (*Puccinia recondita* Roberge ex Desmaz) resistance gene, but is susceptible to current prevalent races. Antelope is susceptible to wheat streak mosaic virus,

wheat soilborne mosaic virus, Russian wheat aphid (*Diuraphia noxia* Mordvilko) and Hessian fly (*Mayetiola destructor* Say). It has been rated in field screens as tolerant to barley yellow dwarf virus. Antelope has shown exceptional productivity under irrigated trials in western Nebraska, eastern Wyoming and eastern Colorado. Milling and baking properties were determined by the Nebraska Wheat Quality Laboratory and by the USDA-ARS Grain Marketing and Production Research in Manhattan, KS. Chinese raw noodle making properties were evaluated by the Wheat Marketing Center in Portland, OR.

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

**Variety Name:** 'Arrowsmith'

**Scientists:** R.A. Graybosch, C.J. Peterson, P.S. Baenziger, L.A. Nelson, B.B. Beecher, D.D. Baltensperger, J.M. Krall

**Released by:** United States Department of Agriculture, Nebraska Agricultural Experiment Station, University of Nebraska, Wyoming Agricultural Experiment Station, University of Wyoming

**Characteristics:** 'Arrowsmith' was derived from the cross KS87809-10/'Arapahoe' in 1993. It is awned and white-glumed. Grain samples were classified as hard white, with color characteristics acceptable for this class. Arrowsmith contains less than 0.1% hard red grain and also contains tall off-types at a frequency of approximately 0.5%. Sprouting tolerance is less than that of Nuplains; hence, it is recommended for cultivation only west of the 100<sup>th</sup> meridian. Arrowsmith has a medium coleoptile, similar to Arapahoe. Heading dates and winter hardiness are similar to Arapahoe, and winter survival is adequate for cultivation in Nebraska and similar environments. Arrowsmith is postulated to carry Lr21 leaf rust (*Puccinia recondita* Roberge ex Desmaz.) resistance gene, but is susceptible to current prevalent races. Arrowsmith was scored moderately resistant to natural outbreaks of stripe rust (*Puccinia striiformis* Westend) in Nebraska in 2001 and 2003. Arrowsmith is susceptible to wheat streak mosaic virus, wheat soil-

	<p>borne mosaic virus, Russian wheat aphid (<i>Diuraphia noxia</i> Mordviko) and Hessian fly (<i>Mayetiola destructor</i> Say) but has been rated as tolerant to field outbreaks of barley yellow dwarf virus. Arrow-smith primarily is adapted to dryland sites in western Nebraska and eastern Wyoming. Milling and baking properties were determined by the Nebraska Wheat Quality Laboratory and by the USDA-ARS Grain Marketing and Production Research in Manhattan, KS. Chinese raw noodle making properties were evaluated by the Wheat Marketing Center in Portland, OR.</p>
<b>Crop:</b>	Sweetclover [ <i>Melilotus alba</i> Desr.]
<b>Variety Name:</b>	49 white-flowered sweet clover and one yellow-flowered sweet clover
<b>Scientists:</b>	H. Gorz and F. Haskins
<b>Released by:</b>	United States Department of Agriculture, and the Agricultural Research Division, Institute of Agriculture and Natural Resources, University of Nebraska
<b>Characteristics:</b>	<p>The forty-nine <i>M. alba</i> genetic stocks include a set of 16 lines, N30 through N45, which represent all possible homozygous combinations of four allelic pairs, <i>Y/y</i>, <i>C/c</i>, <i>Cu/cu</i>, and <i>B/b</i>. The development of these 16 lines involved both annual and biennial forms of <i>M. alba</i>. Both forms may be present in these lines. Lines N46 through N49 and N741, N743, N745, and N747 are two sets of four lines, each set representing all possible homozygous combinations of the <i>Cu/cu</i> (coumarin content) and <i>B/b</i> alleles (<math>\beta</math>-glucosidase activity) alleles. N46 through N49 are annuals. N741, N743, N745 and N747 are biennial lines. N50 through N53 are biennial lines representing all possible homozygous combinations of the <i>Y/y</i> and <i>C/c</i> allelic pairs. N54 and N55 are biennial lines that are homozygous for susceptibility and resistance, respectively, to stem canker disease caused by <i>Ascochyta caulicola</i> (Laub.). U389 is an annual line that was derived from a single plant of the introduction PI 165554. All other U-numbered lines were developed following treatment of U389 seed with ethyl methanesulfonate. These U- numbered lines are: U362, U363, U367, U369 - U374, U390 - U394, U396 - U398, and U500. One yellow-flowered sweet clover, N56, a biennial strain of <i>M. officinalis</i>, combines finestem growth habit and low coumarin content of <i>M. alba</i> with the large-seeded</p>
<p>Winter Triticale (<i>X. Triticosecale rimpaui</i> Wittm.)</p> <p>NE426GT</p> <p>P.S. Baenziger, J. Jannink, and L.R. Gibson</p> <p>Nebraska Agricultural Experiment Station, University of Nebraska, and the Iowa Agricultural Experiment Station, Iowa State University</p> <p>NE426GT is a grain and fall forage winter triticale (<i>X. Triticosecale rimpaui</i> Wittm.) cultivar. It is an <math>F_3</math>-derived <math>F_4</math> line that was selected in 1995 for its high grain yield potential. NE426GT is an awned, white-glumed cultivar whose primary use will be as an annual grain or forage crop. Field appearance is most similar to Newcale. Kernels are red colored, elliptical, large, and slightly wrinkled. The main advantages of NE426GT when compared to most other grain and forage triticale cultivars, within its area of adaptation, is its very high grain yield coupled with its relatively high fall forage yield. As such, it will be used as a feed grain triticale and as a component of forage triticale blends. NE426GT is moderately resistant to the currently prevalent races of stem rust (caused by <i>Puccinia graminis</i> Pers.: Pers.f.sp. <i>tritici</i> Eriks &amp; E. Henn; most likely containing Sr31) and leaf rust (caused by <i>P. triticina</i> Eriks.). It is moderately resistant to wheat streak mosaic virus. Ergot (<i>Claviceps purpurea</i> (Fr:Fr)Tul.) has not been found in the cultivar when the disease was present in other triticales under similar growing conditions. It is released primarily for its superior grain</p>	



trait and early maturity of *M. officinalis*. Considerable time was devoted to identifying and increasing seed for release of these sweetclover lines with potential value in genetic and biochemical studies as well as in improvement programs.

**Crop:** Big Bluestem [*Andropogon gerardii* Vitman]

**Cultivar Name:** Bonanza

**Scientists:** K.P. Vogel, R.B. Mitchell, T.J. Klopfenstein, and B.E. Anderson

**Released by:** United States Department of Agriculture, and the Agricultural Research Division, Institute of Agriculture and Natural Resources, University of Nebraska

**Characteristics:** Bonanza big bluestem [*Andropogon gerardii* Vitman] is a cultivar that is adapted in the Great Plains and Midwest, USA, to the southern half of USDA Plant Hardiness Zone 4 and Plant Hardiness Zone 5. It produces forage with high *in vitro* dry matter digestibility that results in improved animal gains when utilized by beef cattle in well-managed grazing systems in regions where it is adapted. Bonanza was developed by three generations of breeding for improved forage yield and forage digestibility as measured by *in vitro* dry matter digestibility. The base population was the cultivar Pawnee, which was released in 1963. The breeding phase of the research was initiated in 1977. Each breeding generation took approximately five years. After the third breeding generation was completed, seed was increased for use in small plot evaluation trials and a replicated grazing trial. Bonanza is a stable, improved, random mating population and will be maintained and increased accordingly.

**Crop:** Big Bluestem [*Andropogon gerardii* Vitman]

**Cultivar Name:** Goldmine

**Scientists:** K.P. Vogel, R.B. Mitchell, T.J. Klopfenstein, and B.E. Anderson

**Released by:** United States Department of Agriculture, and the Agricultural Research Division, Institute of Agriculture and Natural Resources, University of Nebraska

**Characteristics:** Goldmine big bluestem [*Andropogon gerardii* Vitman] is a cultivar that is adapted in the Great Plains and Midwest, USA, to

the southern half of USDA Plant Hardiness Zone 5 and Plant Hardiness Zone 6. It produces forage with moderately improved *in vitro* dry matter digestibility (IVDMD) and improved forage yields in some environments that results in improved animal gains when utilized by beef cattle in well-managed grazing systems in regions where it is adapted. Goldmine was developed by three generations of breeding for improved forage yield and forage digestibility as measured by IVDMD. The base population was the cultivar Kaw, which was released in 1950. The breeding phase of the research was initiated in 1977 and consisted of three generations of breeding using a modified restricted, recurrent selection breeding system in which forage yield and forage IVDMD were the main selection criteria. Each breeding generation took approximately five years. After the third breeding generation was completed, seed was increased for use in small plot evaluation trials and a replicated grazing trial. Goldmine is a stable, improved, random mating population and will be maintained and increased accordingly.

## West Central District Variety and Germplasm Releases:

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

**Variety Name or Germplasm Nomenclature:**

ABCP-8

**Scientists:** N. Mutlu, J.R. Steadman, A.K. Vidaver, D.T. Lindgren, J. Reiser, P.N. Miklas, M.A. Pastor-Corrales

**Released by:** Nebraska Agricultural Experiment Station, University of Nebraska-Lincoln; United States Department of Agriculture, Agricultural Research Service, Washington, DC

**Characteristics:** This line combines the common bacterial blight resistance from XAN 159 with that of great northern Montana No. 5. It also possesses the *UR-3* gene for resistance to common bean rust and the *bc-1<sup>2</sup>* gene for BCMV and BCMNV. Seed size is 30 grams/100 seeds. It yielded 117% and

<p>148% of the yield for 'Chase' in Nebraska (2001 and 2003, respectively). It has a semi-prostrate growth habit.</p> <p><b>Crop:</b> Pinto Dry Edible Bean (<i>Phaseolus vulgaris</i> L.)</p> <p><b>Variety Name or Germplasm Nomenclature:</b> ABCP-15</p> <p><b>Scientists:</b> N. Mutlu, J.R. Steadman, A.K. Vidaver, D.T. Lindgren, J. Reiser, P.N. Miklas, M.A. Pastor-Corrales</p> <p><b>Released by:</b> Nebraska Agricultural Experiment Station, University of Nebraska-Lincoln; United States Department of Agriculture, Agricultural Research Service, Washington, DC</p> <p><b>Characteristics:</b> This line combines the common bacterial blight resistance from XAN 159 with that of great northern Montana No. 5. It also possesses the <i>UR-3</i> gene for resistance to common bean rust and the <i>bc-1<sup>2</sup></i> gene for BCMV and BCMNV. This line has slightly larger seeds, 34 grams/100 seeds, than 'Chase'. It yields slightly less than 'Chase'. ABCP-15 exhibits slightly less resistance to common bacterial blight than ABCP-8.</p>	<p>a semi-prostrate growth. Common blight infection was 12% in the field and 9% in the greenhouse.</p> <p><b>Crop:</b> Great Northern Dry Edible Bean (<i>Phaseolus vulgaris</i> L.)</p> <p><b>Variety Name or Germplasm Nomenclature:</b> BMN-RMR-8</p> <p><b>Scientists:</b> J.R. Stavely, M.A. Pastor-Corrales, J.D. Kelly, J. Steadman, D.P. Coyne, D.T. Lindgren</p> <p><b>Released by:</b> United States Department of Agriculture, Agricultural Research Service, Washington, DC; Michigan Agricultural Experiment Station, East Lansing, Michigan; University of Nebraska-Lincoln, Agricultural Research Division</p> <p><b>Characteristics:</b> This is a rust and mosaic resistant, high yielding, upright short vine, type II, white seeded, great northern dry bean germplasm line. Under field conditions, it is an erect plant with moderately early maturity, high yield, good pod-to-ground clearance. Seed size averages 33.9 grams/100 seeds.</p>
<p><b>Crop:</b> Pinto Dry Edible Bean (<i>Phaseolus vulgaris</i> L.)</p> <p><b>Variety Name or Germplasm Nomenclature:</b> ABCP-17</p> <p><b>Scientists:</b> N. Mutlu, J.R. Steadman, A.K. Vidaver, D.T. Lindgren, J. Reiser, P.N. Miklas, M.A. Pastor-Corrales</p> <p><b>Released by:</b> Nebraska Agricultural Experiment Station, University of Nebraska-Lincoln; United States Department of Agriculture, Agricultural Research Service, Washington, DC</p> <p><b>Characteristics:</b> This line combines the common bacterial blight resistance from XAN 159 with that of great northern Montana No. 5. It also possesses the <i>UR-3</i> gene for resistance to common bean rust and the <i>bc-1<sup>2</sup></i> gene for BCMV and BCMNV. ABCP-17 has similar size seed to 'Chase' but yielded slightly less than 'Chase' in 2001 and 2003. It has</p>	<p><b>Crop:</b> Great Northern Dry Edible Bean (<i>Phaseolus vulgaris</i> L.)</p> <p><b>Variety Name or Germplasm Nomenclature:</b> BMN-RMR-9</p> <p><b>Scientists:</b> J.R. Stavely, M.A. Pastor-Corrales, J.D. Kelly, J. Steadman, D.P. Coyne, D.T. Lindgren</p> <p><b>Released by:</b> United States Department of Agriculture, Agricultural Research Service, Washington, DC; Michigan Agricultural Experiment Station, East Lansing, Michigan; University of Nebraska-Lincoln, Agricultural Research Division</p> <p><b>Characteristics:</b> This is a rust and mosaic resistant, high yielding, upright short vine, type II, white seeded, great northern dry bean germplasm line. Under field conditions, it is an erect plant with moderately early maturity, high yield, good pod-to-ground clearance. Seed size averages 34.3 grams/100 seeds.</p>

**Crop:** Great Northern Dry Edible Bean (*Phaseolus vulgaris* L.)

**Variety Name or Germplasm Nomenclature:** BMN-RMR-10

**Scientists:** J.R. Stavely, M.A. Pastor-Corrales, J.D. Kelly, J. Steadman, D.P. Coyne, D.T. Lindgren

**Released by:** United States Department of Agriculture, Agricultural Research Service, Washington, DC; Michigan Agricultural Experiment Station, East Lansing, Michigan; University of Nebraska-Lincoln, Agricultural Research Division

**Characteristics:** This is a rust and mosaic resistant, high yielding, upright short vine, type II, white seeded, great northern dry bean germplasm line. Under field conditions, it is an erect plant with moderately early maturity, high yield, good pod-to-ground clearance. Seed size averages 33.3 grams/100 seeds.

**Crop:** Great Northern Dry Edible Bean (*Phaseolus vulgaris* L.)

**Variety Name or Germplasm Nomenclature:** BMN-RMR-11

**Scientists:** J.R. Stavely, M.A. Pastor-Corrales, J.D. Kelly, J. Steadman, D.P. Coyne, D.T. Lindgren

**Released by:** United States Department of Agriculture, Agricultural Research Service, Washington, DC; Michigan Agricultural Experiment Station, East Lansing, Michigan; University of Nebraska-Lincoln, Agricultural Research Division

**Characteristics:** This is a rust and mosaic resistant, high yielding, upright short vine, type II, white seeded, great northern dry bean germplasm line. Under field conditions, it is an erect plant with moderately early maturity, high yield, good pod-to-ground clearance. Seed size averages 36.7 grams/100 seeds.

**Crop:** Great Northern Dry Edible Bean (*Phaseolus vulgaris* L.)

**Variety Name or Germplasm Nomenclature:** BMN-RMR-12

**Scientists:** J.R. Stavely, M.A. Pastor-Corrales, J.D. Kelly, J. Steadman, D.P. Coyne, D.T. Lindgren

**Released by:** United States Department of Agriculture, Agricultural Research Service, Washington, DC; Michigan Agricultural Experiment Station, East Lansing, Michigan; University of Nebraska-Lincoln, Agricultural Research Division

**Characteristics:** This is a rust and mosaic resistant, high yielding, upright short vine, type II, white seeded, great northern dry bean germplasm line. Under field conditions, it is an erect plant with moderately early maturity, high yield, good pod-to-ground clearance. Seed size averages 35.7 grams/100 seeds.

**Crop:** Great Northern Dry Edible Bean (*Phaseolus vulgaris* L.)

**Variety Name or Germplasm Nomenclature:** BMN-RMR-13

**Scientists:** J.R. Stavely, M.A. Pastor-Corrales, J.D. Kelly, J. Steadman, D.P. Coyne, D.T. Lindgren

**Released by:** United States Department of Agriculture, Agricultural Research Service, Washington, DC; Michigan Agricultural Experiment Station, East Lansing, Michigan; University of Nebraska-Lincoln, Agricultural Research Division

**Characteristics:** This is a rust and mosaic resistant, high yielding, upright short vine, type II, white seeded, great northern dry bean germplasm line. Under field conditions, it is an erect plant with moderately early maturity, high yield, good pod-to-ground clearance. Seed size averages 36.3 grams/100 seeds.



Copyright and patent protection is an important parameter in research. It is especially important for discoveries and innovations that have a potential commercial application. Therefore, from time to time, the ARD (and the University) may determine that the public good is best served with regard to technology transfer by entering into an agreement with a public or private institution that provides the institution with proprietary interests in specific research. The research of ARD scientists often can lead to a patent. Most of the patents that have been awarded to ARD scientists have been for equipment developments and specialized processes. These patents often are licensed by private industry, with royalties being reinvested in future ARD research. The following patent was awarded in 2004-05.

Biological Systems Engineering

Patent

<i>Patent Title:</i>	Flash Artifact Suppression in Two-Dimensional Ultrasound Imaging
<i>Patent Number:</i>	6,760,486 (USA)
<i>Scientists:</i>	G.R. Bashford (University of Nebraska-Lincoln, Agricultural Research Division), Richard Chiao (scientist with GE Medical Systems), Mark Feilen (software engineer with GE Medical Systems), and Cynthia Owen (sonographer at Baptist Medical Center, Memphis, Tennessee)
<i>Description:</i>	Flash artifacts in ultrasound flow images are suppressed to achieve enhanced flow discrimination. Flash artifacts typically occur as regions of elevated signal strength (brightness or equivalent color) within an image. A flash suppression algorithm includes the steps of estimating the flash within an image and then suppressing the estimated flash. The mechanism for flash suppression is spatial filtering.

**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 2005)

**University of Nebraska  
Board of Regents**

Randolph Ferlic, Omaha	Jim McClurg, Lincoln
Chuck Hassebrook, Lyons	Drew Miller, Papillion
Howard Hawks, Omaha	Ken Schroeder, Kearney
David Hergert, Scottsbluff	Charles S. Wilson, Lincoln

**Student Regents**

UNMC	—	Nicholas Behrendt
UNO	—	Elizabeth Kraemer
UNL	—	Omaid Zabih
UNK	—	Brad Bohn

**Administrative Officers**

James B. Milliken, 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

Z B Mayo, Interim Associate Dean and Associate Director

Alan E. Baquet, Interim Associate Dean and Associate Director<sup>1</sup>

Marjorie J. Kostelnik, Assistant Director, Human Resources and Family Sciences

Dora Dill, Administrative Technician

Nelvie Lienemann, Staff Assistant

Diane Mohrhoff, Project Assistant

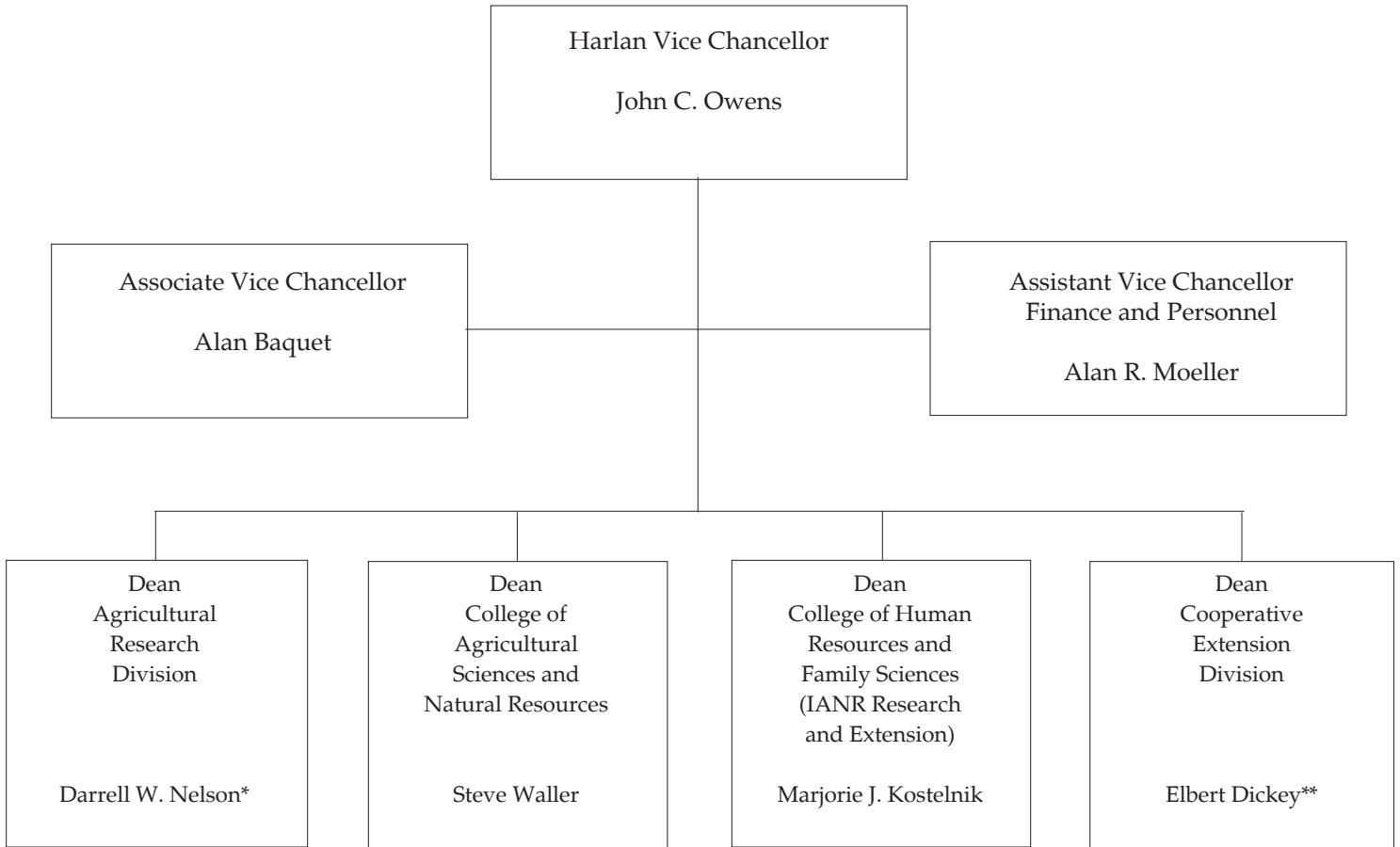
Karen Jackson, Programming Assistant

<sup>1</sup>Left position to become Department Head of Agricultural Economics

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## Organizational Chart

### Institute of Agriculture and Natural Resources University of Nebraska-Lincoln June 2005



\*Director, Nebraska Agricultural Experiment Station

\*\*Director, University of Nebraska Cooperative Extension



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**Administrative Units Reporting to Agricultural Research Division  
Institute of Agriculture and Natural Resources  
The University of Nebraska–Lincoln  
June 2004**

**Agricultural/Natural  
Resources Units**

*Agricultural Economics*  
Dick Clark, Interim Head<sup>1</sup>  
Alan Baquet, Head<sup>2</sup>

*Agricultural Leadership,  
Education and Communication*  
Susan Fritz, Head

*Agronomy and Horticulture*  
Kenneth Cassman, Head<sup>1</sup>  
Lowell Moser, Interim Head<sup>2</sup>

*Animal Science*  
Donald Beermann, Head

*Biochemistry*  
Donald Weeks

*Biological Systems Engineering*  
Derrel Martin, Interim Head<sup>1</sup>  
Ron Yoder, Head<sup>2</sup>

*Entomology*  
Z B Mayo, Head<sup>1</sup>  
Fred Baxendale, Interim  
Head<sup>2</sup>

*Food Science and Technology*  
Steve Taylor, Head<sup>1</sup>  
David Jackson, Interim  
Head<sup>2</sup>

*Plant Pathology*  
Anne Vidaver, Head

*School of Natural  
Resources*  
Mark Kuzila, Director

*Statistics*  
Walter Stroup, Chair

*Veterinary and Biomedical  
Sciences*  
Jack Schmitz, Head<sup>1</sup>  
Rod Moxley, Interim Head<sup>2</sup>

**Human Resources  
and Family Sciences  
Department**

*Family and Consumer Sciences*  
Julie Johnson, Chair

*Nutritional Science and  
Dietetics*  
Marilynn Schnepf, Chair

*Textiles, Clothing and Design*  
Carol Thayer, Chair<sup>1</sup>  
Michael James, Acting Chair<sup>2</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

*Southeast Research  
and Extension Center*  
Lincoln—Susan Williams,  
Director

*West Central Research  
and Extension Center*  
North Platte—Don Adams,  
Interim Director

**Interdisciplinary  
Centers**

*Biotechnology Center*  
Michael Fromm, Director

*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 Applied  
Rural Innovation*  
Alan Baquet, Director<sup>2</sup>

*Water Center*  
Kyle Hoagland, Director  
Mike Jess, Acting Director

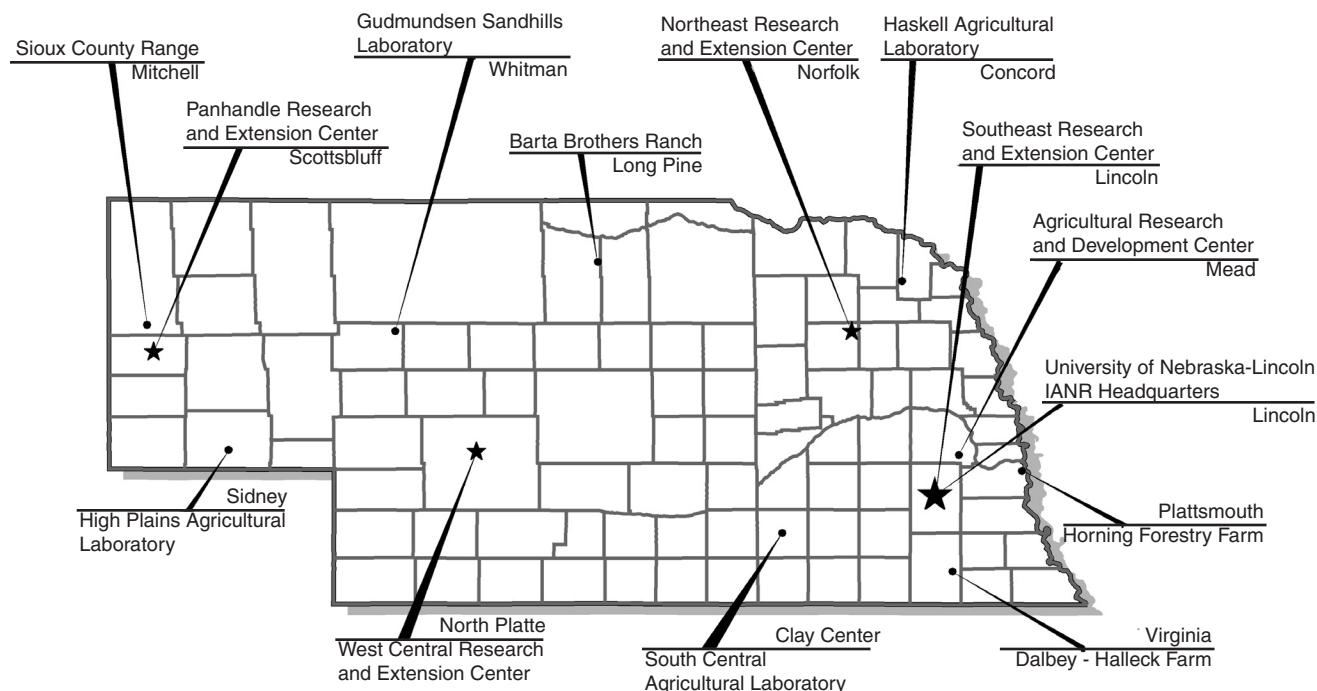
*IANR Communications  
and Information Technology*  
Brenda Caine, Director

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<sup>1</sup>Ended appointment during 2004-2005

<sup>2</sup>Began appointment during 2004-2005

## 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 Agricultural Laboratory, Great Plains Veterinary Educational Center, and the U.S. Meat Animal Research Center (USDA) — Clay Center
- Southeast Research and Extension Center — Lincoln
- West Central Research and Extension Center — North Platte

Approximately 264 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.

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 among 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 60 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 Department of Entomology has 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 2004-2005 departmental budgets.

## Agricultural/Natural Resources Units

	Rank	Rsch	Ext	Tch	Other	Area of Responsibility
<b>Agricultural Economics</b>						
Richard T. Clark	Professor	0.51	0.20	0.29		Interim Head
J. David Aiken	Professor	0.45	0.25	0.30		Agricultural and Natural Resources Law
John C. Allen	Professor	0.30	0.20	0.80	0.42	Director, Center for Applied Rural Innovation
Azzeddine Azzam	Professor	0.75		0.25		Research and Quantitative Methods, Industrial Organization of Food Processing
Dennis Conley	Professor	0.45		0.55		Agribusiness
Lilyan Fulginiti	Professor	0.75		0.25		Agricultural Policies/Production
Konstantinos Giannakas	Associate 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
Gary Lynne	Professor	0.75		0.25		Agricultural Finance Policy
Richard Perrin	Professor	0.75		0.25		Natural Resource Economics
E. Wesley F. Peterson	Professor	0.65		0.35		Production Economics
Jeffrey S. Royer	Professor	0.70		0.30		International Trade, Development and Policy
Raymond J. Suppalla	Professor	0.75		0.25		Agriculture Marketing Systems, Agribusiness Management, Organization and Performance of Ag and Food Industries
Amalia Yiannaka	Assistant Professor	0.50		0.50		Natural Resource Economics
						Intellectual Property Rights, Industrial Organization, Agricultural Marketing, Environment and Resource Economics

## Agricultural Leadership, Education and Communication

Susan M. Fritz	Associate Professor	0.37		0.54	0.09	Head, Leadership Development
John E. Barbuto Jr.	Associate Professor	0.50		0.50		Leadership Development
James W. King	Associate Professor	0.25		0.75		Distance Education
Daniel W. Wheeler	Professor	0.25	0.25	0.50		Leadership Development

<sup>1</sup>Ended research appointment during 2004-2005

<sup>2</sup>Began research appointment during 2004-2005



	Rank	Rsch	Ext	Tch	Other	Area of Responsibility
<b>Agronomy and Horticulture</b>						
Lowell E. Moser	Professor	0.35		0.65		Head
Bruce E. Anderson	Professor	0.25	0.75			Forage Specialist
Timothy J. Arkebauer	Associate Professor	0.85		0.15		Crop Environmental Physiologist
P. Stephen Baenziger	Professor	0.75		0.25		Small Grains Breeding and Genetics
Brian S. Beecher <sup>1</sup>	Assistant Professor	0.80	0.20			Cereal Chemist/Food Scientist
Kenneth G. Cassman	Professor	0.60	0.30	0.10		Systems Agronomist
Thomas E. Clemente	Associate Professor	0.40			0.60	Manager, Plant Transformation Core Resource Facility
Achim R. Dobermann	Associate Professor	0.70	0.30			Soil Fertility/Integrated Nutrient Management
John W. Doran <sup>1</sup>	Professor	1.00			USDA	Soil Biochemistry
Rhae A. Drijber	Associate Professor	0.75		0.25		Soil Microbial Ecologist
Ismail M. Dweikat	Assistant Professor	0.80		0.20		Sorghum Genetics
Jerry D. Eastin <sup>1</sup>	Professor	0.85		0.15		Environmental Crop Stress Physics
Bahman Eghball <sup>1</sup>	Associate Professor	1.00			USDA	Soil Scientist
Roger W. Elmore <sup>1</sup>	Professor	0.50	0.50			Crops Specialist
Thomas E. Elthon <sup>2</sup>	Associate Professor	0.62		0.08	0.03	Protein Researcher
Richard B. Ferguson	Professor	0.75	0.25			Soil Fertility Specialist
Charles A. Francis	Professor	0.43	0.37	0.20		Farming and Landscape Design
Roch E. Gaussoin	Professor	0.25	0.75			Turfgrass Management and Physiology
George L. Graef	Professor	0.85		0.15		Soybean Breeding and Genetics
Robert A. Graybosch	Professor	1.00			USDA	Wheat Genetics
Laurie Hodges	Associate Professor	0.25	0.75			Commercial Horticulture Production Specialist
Garald L. Horst	Professor	0.40		0.60		Turfgrass Physiology and Management
Donald J. Lee	Professor	0.25	0.15	0.60		Plant Geneticist
John L. Lindquist	Associate Professor	0.80		0.20		Crop/Weed Ecologist
Sally A. Mackenzie	Professor	0.50		0.10	0.40	Program Leader, Plant Science Initiative
Martha Mamo	Assistant Professor	0.25		0.75		Soil Chemist/Biochemistry
Alexander R. Martin	Professor	0.33	0.67			Integrated Weed Management/Reduced Herbicide Input
Stephen C. Mason	Professor	0.50		0.50		Cropping Systems
Martin A. Massengale	Professor	0.49	0.33	0.18		Grassland/Forages, Director, Center for Grassland Studies
Dennis L. McCallister	Professor	0.40		0.60		Soil Chemistry
Lenis A. Nelson	Professor	0.50	0.50			Crop Variety Evaluation/New Crops
Ellen T. Paparozzi	Professor	0.50		0.50		Urban Horticulture, Floriculture and Ornamental
Jeffrey F. Pedersen	Professor				USDA	Sorghum Genetics and Breeding
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		Turfgrass Plant Breeding
Fred W. Roeth <sup>1</sup>	Professor	0.50	0.50			Weed Specialist
W. Ken Russell	Assistant Professor	0.80		0.20		Plant Quantitative Genetics
Gautam Sarath	Professor				USDA	Molecular Biologist
Walter H. Schacht	Associate Professor	0.60		0.40		Range Science
James S. Schepers	Professor				USDA	Soil Chemistry
John F. Shanahan	Assistant Professor				USDA	Crop Physiology
Robert C. Shearman	Professor	0.65	0.15	0.20		Integrated Turfgrass Management

<sup>1</sup>Ended research appointment during 2004-2005

<sup>2</sup>Began research appointment during 2004-2005

	Rank	Rsch	Ext	Tch	Other	Area of Responsibility
<b>Agronomy and Horticulture (continued)</b>						
Roy F. Spalding	Professor	0.90		0.10		Hydrochemist, Director, Water Science Lab
James E. Specht	Professor	0.80		0.20		Soybean Physiologist-Geneticist
Paul E. Staswick	Professor	0.85		0.15		Plant Molecular Biologist
James L. Stubbendieck	Professor	0.25		0.25	0.50	Range Ecology/Director for Great Plains Studies
Jeanette A. Thurston	Assistant Professor				USDA	Environmental Microbiologist
Kim W. Todd <sup>2</sup>	Assistant Professor	0.25		0.75		Landscape Horticulture
Gary E. Varvel	Professor				USDA	Soil Management
Kenneth P. Vogel	Professor				USDA	Grass Breeding
Daniel T. Walters	Professor	0.65		0.35		Soil Management
Brian J. Weinhold	Assistant Professor				USDA	Soil Fertility
Wallace W. Wilhelm	Professor				USDA	Crop Physiology
Charles S. Wortmann	Assistant Professor	0.30	0.70			Nutrient Management Specialist

## Animal Science

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
Larry V. Cundiff	Professor				USDA	Beef Genetics
Andrea S. Cupp	Assistant Professor	0.70		0.30		Beef Physiology
Samar A. Elnagar	Professor				Academia	Physiology
Galen E. Erickson	Assistant Professor	0.50	0.40	0.10		Feedlot Nutrition
Calvin L. Ferrell	Professor				USDA	Nutrition
J. Joe Ford	Professor				USDA	Physiology
Kathryn J. Hanford <sup>2</sup>	Research Assistant Professor					
Thomas G. Jenkins	Professor				1.00	Statistical Genetics
Rodger K. Johnson	Professor				USDA	Genetics
Rodger K. Johnson	Professor	0.60		0.40		Swine Genetics
Steven J. Jones	Professor	0.35		0.65		Meats
Jeffrey F. Keown	Professor	0.30	0.70			Dairy Management
Roger J. Kittok <sup>1</sup>	Associate Professor	0.85		0.15		Reproductive Physiology
Terry J. Klopfenstein	Professor	0.70		0.30		Ruminant Nutrition
Richard K. Koelsch	Associate Professor	0.09	0.21		0.70	Livestock Waste Management
Paul J. Kononoff <sup>2</sup>	Assistant Professor	0.70	0.30			Dairy Nutrition
Mohammad Koohmaraie	Professor				USDA	Meats
Larry L. Larson	Associate Professor	0.40		0.60		Dairy Physiology
Kreg A. Leymaster	Professor				USDA	Genetics
Donald D. Lunstra	Professor				USDA	Physiology
Roger W. Mandigo	Professor	0.60		0.40		Meats
Phillip S. Miller	Professor	0.60		0.40		Swine Nutrition
C. Todd Milton <sup>1</sup>	Professor				Industry	Feedlot Nutrition
Jess L. Miner	Associate Professor	0.70		0.30		Nutritional Biochemistry
Merlyn K. Nielsen	Professor	0.60		0.40		Genetics
Daniel H. Pomp <sup>1</sup>	Professor	0.81		0.19		Genetics
Rick J. Rasby	Professor	0.25	0.75			Beef Management
Thomas A. Rathje	Professor				Industry	Swine Genetics

	Rank	Rsch	Ext	Tch	Other	Area of Responsibility
<b>Animal Science (continued)</b>						
Gary A. Rohrer	Professor				USDA	Genetics
Sheila E. Scheideler	Professor	0.45	0.50	0.05		Poultry Management
Rick A. Stock	Professor				Industry	Ruminant Nutrition
Mike T. Van Koevering <sup>2</sup>	Professor				Industry	Ruminant Nutrition
L. Dale Van Vleck	Professor	0.05		0.15	USDA	Genetics
Vincent H. Varel	Professor				USDA	Bacterial Physiology
John S. Weber	Assistant Professor	0.80		0.20		Functional Geomics
Tommy L. Wheeler	Professor				USDA	Meats
Brett R. White	Assistant Professor	0.50		0.50		Swine Physiology
Jong-Tseng Yen <sup>1</sup>	Professor				USDA	Nutrition
<b>Biochemistry</b>						
Donald P. Weeks	Professor	0.55		0.10	0.35	Head, Plant Molecular Biology
Han H. Asard <sup>1</sup>	Associate Professor	0.85		0.15		Plant Biochemistry
Ruma Banerjee	Professor	0.85		0.15		Mechanistic Enzymology
Joseph J. Barycki	Assistant Professor	0.80		0.20		Protein Crystallography
Donald F. Becker	Assistant Professor	0.80		0.20		Protein Electrochemistry
Raymond Chollet	Professor	0.80		0.20		Photosynthesis
Dmitri Fomanko <sup>2</sup>	Research Assistant					
	Professor				1.00	Molecular Biology
Vadim N. Gladyshev	Professor	0.80		0.20		Protein Biochemistry, Selenium
Hwa-Young Kim <sup>2</sup>	Research Assistant					
	Professor				1.00	Redox Biology, Selenium Biochemistry
Jaekwon Lee	Assistant Professor	0.80		0.20		Metal Metabolism
John P. Markwell	Professor	0.25		0.25		Plant Biochemistry
Sergey V. Novoselov	Research Assistant					
	Professor				1.00	Molecular/Cell Biology
Stephen W. Ragsdale	Professor	0.85		0.15		Enzymes
Ashraf Raza	Assistant Professor				1.00	Proteomics/Metabolomics
Gautam Sarath	Adjunct Faculty	1.00				Protein Biochemistry
Javier Seravalli	Assistant Professor				1.00	Enzymology
Melanie Simpson	Assistant Professor	0.80		0.20		Cellular Biochemistry
Robert Spreitzer	Professor	0.85		0.15		Plant Molecular Genetics
Julie M. Stone	Assistant Professor	0.63		0.37		Plant Molecular Biology
Charles Wood	Professor	0.25			0.75	Virology

	Rank	Rsch	Ext	Tch	Other	Area of Responsibility
<b>Biological Systems Engineering</b>						
Ronald E. Yoder	Professor				1.00	Head, Irrigation and Water Resources Engineering
Viacheslav I. Adamchuk	Assistant Professor	0.40	0.50	0.10		Precision Agriculture
Alejandro Amezquita	Assistant Professor				Industry	Food Safety Engineering
Gregory R. Bashford	Assistant Professor	0.50		0.50		Biomedical Engineering
David Billesbach	Research Assistant					
	Professor				1.00	Gaseous Emissions
Rhonda M. Brand	Assistant Professor				Industry	Evanston Northwestern Healthcare Research Institute
Tami Brown-Brandl	Assistant Professor				USDA	Animal, Environmental and Waste Management
L. Davis Clements <sup>1</sup>	Professor				Industry	RPDL Company
Roger A. Eigenberg	Assistant Professor				USDA	Animal, Environmental and Waste Management
Dean E. Eisenhauer	Professor	0.50		0.50		Hydrology and Irrigation
Qi Fang	Assistant Professor				Industry	Industrial Ag Products
Sandun Fernando	Assistant Professor				Industry	Bioenergy, Biomaterials, Biolubricants
Thomas G. Franti	Associate Professor	0.25	0.75			Surface Water Management
Girish Ganjyal	Assistant Professor				Industry	Food and Bioprocess Engineering
Aris Gennadios	Associate Professor				Industry	Pharmaceutical Manufacturing
Viswas Ghorpade	Assistant Professor				Industry	Hill's Pet Nutrition, Inc.
John E. Gilley	Professor				USDA	Soil Erosion and Waste Management
Milford A. Hanna	Professor	0.75			0.25	Food and Bioprocess Engineering
Terry A. Howell	Professor				USDA	Irrigation Management
Keum Taek Hwang	Assistant Professor				Industry	Food Processing
Ayse Irmak	Research Assistant					
	Professor	1.00				Crop Modeling
Suat Irmak	Assistant Professor	0.40	0.60			Irrigation Management and Soil and Water Engineering
David D. Jones	Associate Professor	0.35		0.65		Engineering and Modeling of Biological Systems
Michael F. Kocher	Associate Professor	0.40		0.60		Sensors and Controls Engineering
Richard K. Koelsch	Associate Professor	0.21	0.49		0.30	Livestock Bioenvironmental Engineering
Derrel L. Martin	Professor	0.65	0.35			Irrigation and Water Resources Engineering
George E. Meyer	Professor	0.60		0.40		Sensors and Machine Vision
John A. Nienaber	Professor				USDA	Livestock Environment
Dennis D. Schulte	Professor	0.50		0.50		Pollution Control and Energy Systems
Jeyamkondan Subbiah <sup>2</sup>	Assistant Professor	0.80		0.20		Food and Bioprocess Engineering
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
Bryan Woodbury	Assistant Professor				USDA	Animal, Environment and Waste Management
Yiqi Yang	Professor	0.15			0.85	Textile Chemistry and Polymer and Fiber Sciences

<sup>1</sup>Ended research appointment during 2004-2005

<sup>2</sup>Began research appointment during 2004-2005



	Rank	Rsch	Ext	Tch	Other	Area of Responsibility
<b>Entomology</b>						
Z B Mayo <sup>1</sup>	Professor	0.62	0.29	0.09		Head, Aphid Genetics
Lisa M. Baird <sup>2</sup>	Professor				U San Diego	Insect/Plant Interactions
Frederick P. Baxendale	Professor	0.25	0.75			Interim Head, Turf Insects
Dennis R. Berkebile	Assistant Professor				USDA	Livestock Entomology
John D. Burd	Professor				USDA	Insect Plant Interactions
Stephen D. Danielson	Associate Professor	0.60		0.40		Field Crop Insect Ecology
Mary Ellen Dix <sup>1</sup>	Associate Professor				USDA	Shelterbelt Insects
Odair Fernandes <sup>2</sup>	Assistant Professor				FCAV/ UNESP	Insect Ecology
John E. Foster	Professor	0.50	0.50			Insect Genetics
Neal H. Haskell <sup>2</sup>	Professor				St. Joseph's	Forensic Entomology
E.A. Henrichs	Professor				1.00	Insect-Plant Interactions
Tiffany M. Heng-Moss	Assistant Professor	0.20	0.20	0.60		Plant Resistance to Insects, Insect/ Plant Interaction
Leon G. Higley	Professor	0.80		0.20		Insect Ecology
W. Wyatt Hoback	Associate Professor		0.12	0.13	UNK	Insect Ecology and Physiology
Scott H. Hutchins	Professor				Industry	Integrated Pest Management
David J. Isenhour	Professor				Industry	Lead for International Trade Integration
Shripat T. Kamble	Professor	0.36	0.64			Urban Pest Management
Wayne L. Kramer	Assistant Professor				State	Medical Entomology
Lance J. Meinke	Professor	0.80		0.20		Insect Ecology and Behavior
Daniel J. Moellenbeck	Assistant Professor				Industry	Plant Resistance to Insects
Frank B. Peairs	Professor				CSU	Insect-Plant Interactions
Robert K. D. Peterson	Associate Professor				MSU	Integrated Pest Management
Brett C. Ratcliffe	Professor & Curator	0.80		0.20		Systematics of Scarabaeidae
Gautam Sarath <sup>2</sup>	Professor				USDA	Biochemistry and Molecular Biology
Philip J. Scholl <sup>1</sup>	Professor				USDA	Ectoparasitology
Blair D. Siegfried	Professor	0.80		0.20		Insect Toxicology
Steven R. Skoda	Associate Professor				USDA	Livestock Entomology
C. Michael Smith <sup>1</sup>	Professor				1.00	Plant/Insect Interaction
David W. Stanley <sup>1</sup>	Professor	0.78		0.22		Insect Physiology
David B. Taylor	Associate Professor				USDA	Livestock Entomology
Robert J. Wright	Professor	0.50	0.50			Field Crops Entomology, Integrated Pest Management, Biological Control

## Food Science and Technology

David S. Jackson	Professor	0.60	0.30	0.10		Interim Head, Cereals/Oilseeds Processing
Andrew K. Benson	Associate Professor	0.60		0.40		Food Microbiology
Lloyd B. Bullerman	Professor	0.75	0.10	0.15		Food Microbiology/Mycology
Susan B. Cuppett	Professor	0.40		0.60		Food Lipids
Richard Goodman <sup>2</sup>	Research Professor				1.00	Food Allergy Research
Milford Hanna	Professor	0.20			0.80	Food and Bioprocess Engineering
Susan Hefle	Associate Professor	0.80	0.20			Food Allergy Research
Robert W. Hutkins	Professor	0.65		0.35		Food Biotechnology
Dojin Ryu <sup>1</sup>	Research Assistant Professor				1.00	Food Microbiology/Mycology
Vicki Schlegel	Assistant Professor	0.90		0.10		Quality Assurance

	Rank	Rsch	Ext	Tch	Other	Area of Responsibility
<b>Food Science and Technology (continued)</b>						
Durward A. Smith	Associate Professor	0.25	0.60	0.15		Horticultural Food Crops Processing
Jeyamkondan Subbiah	Assistant Professor	0.45			0.55	Food and Bioprocess Engineering
Steve L. Taylor	Professor	0.40	0.34	0.26		Food Toxicology, Food Allergens
Harsharvardhan Thippareddi	Assistant Professor	0.30	0.70			Food Safety/Food Microbiology
Randy L. Wehling	Professor	0.50		0.50		Food Analysis
Curtis L. Weller	Professor			0.20	0.80	Food and Bioprocess Engineering
Michael G. Zeece	Professor	0.75		0.25		Food Protein Chemistry
Chaomei Zhang	Research Assistant Professor	1.00				Food Microbiology
<b>Plant Pathology</b>						
Anne K. Vidaver	Professor	0.75	0.15	0.10		Head
James Alfano	Associate Professor				1.00	PSI Genetics of Plant-Bacterial Interactions
ShaoRong Chen	Research Assistant Professor				1.00	Plant Molecular Biology
Martin B. Dickman	Professor	0.85		0.15		Genetics of Host/Parasite Interactions
David Dunigan	Research Assistant Professor				1.00	Algal Viruses
Roy C. French	Professor				USDA	Viruses and Nucleic Acids
Deanna L. Funnell	Assistant Professor				USDA	Sorghum Pathology
Loren Giesler	Assistant Professor	0.25	0.75			Soybean, Alfalfa and Landscape Ornament
Steve Harris	Assistant Professor				1.00	PSI Genetics of Fungal Morphogenesis
Tamra A. Jackson <sup>2</sup>	Assistant Professor	0.25	0.75			Corn and Sorghum
Ming Kang	Research Assistant Professor				1.00	Algal Viruses
Leslie C. Lane <sup>1</sup>	Associate Professor	0.75		0.25		Virus Diseases
Amit Mitra	Associate Professor	0.90		0.10		Plant Vector/Plant Transformation
James E. Partridge <sup>1</sup>	Associate Professor			1.00		Host/Parasite Interactions/Stress
Thomas O. Powers	Associate Professor	0.90		0.10		Nematology
James R. Steadman	Professor	0.90		0.10		Epidemiology of Vegetable Diseases
Drake C. Stenger	Associate Professor				USDA	Wheat Virology
Karin van Dijk	Research Assistant Professor				1.00	Gene Silencing
James L. Van Etten	Professor	1.00				Molecular Virology
John E. Watkins	Professor	0.25	0.75			Small Grains, Turf and Alfalfa
Stephen Wegulo <sup>2</sup>	Assistant Professor	0.25	0.75			Small Grains, Forages, and Ornamental Plants
Gary Y. Yuen	Associate Professor	0.85		0.15		Soilborne Diseases
Yuanzheng Zhang	Assistant Professor				1.00	Molecular Biology

<sup>1</sup>Ended research appointment during 2004-2005

<sup>2</sup>Began research appointment during 2004-2005

	Rank	Rsch	Ext	Tch	Other	Area of Responsibility
<b>School of Natural Resources</b>						
Mark S. Kuzila <sup>2</sup>	Professor & Director	0.55	0.25	0.20		Soil Science/Survey
Craig R. Allen	Adjunct Assistant Professor				1.00	Unit Leader, Nebraska Cooperative Fish and Wildlife Research
Tala Awada	Assistant Professor	0.80		0.20		Plant Ecophysiology
Jerry F. Ayers	Associate Professor	0.75		0.25		Environmental Geophysics, Hydrogeology
Francis Belohlavy <sup>2</sup>	Instructor				1.00	Soil Science/Survey
James R. Brandle	Professor	0.70		0.30		Forestry/Windbreaks
Mark Burbach <sup>2</sup>	Assistant Geoscientist	0.75	0.25			Environmental Monitoring-Human Dimensions
Marvin Carolson <sup>2</sup>	Professor	0.60	0.40			Geology/Stratigraphy, Tectonics
Xun-Hong Chen	Associate Professor	1.00				Hydrogeology
Steven D. Comfort	Professor	0.75	0.15	0.10		Soil Environmental Chemistry
Kenneth Dewey <sup>2</sup>	Professor	0.90	0.16		0.75	Meteorology/Climatology, Climate Variations/Severe Weather
Dwane Eversoll <sup>2</sup>	Professor	0.50				Engineering and Environmental Geology
Patricia Freeman <sup>2</sup>	Professor	0.75	0.75			Mammalian Biology; Vertebrate Zoology
Anatoly A. Gitelson	Professor	0.75			0.25	Remote Sensing
James Goeke <sup>2</sup>	Professor	0.25	0.75			Groundwater Geology
David C. Gosselin	Professor	0.65	0.10	0.25		Earth Science
F. Edwin Harvey	Associate Professor	0.80		0.20		Hydrogeology
Michael J. Hayes	Associate Professor				1.00	Agricultural Climatology
Geoffrey M. Henebry	Associate Professor				1.00	Landscape Ecology/Remote Sensing
Scott E. Hygnstrom	Professor	0.25	0.50	0.25		Integrated Pest Management/Wildlife Damage Management
Kyle D. Hoagland	Professor	0.35		0.15	0.50	Limnology and Director, Water Center
John Holz	Assistant Professor	0.72	0.13	0.15		Limnology/Lake Management
Qi Hu	Associate Professor	0.55	0.10		0.35	Agricultural Climatology
Kenneth G. Hubbard	Professor	0.67	0.23	0.10		Agricultural Climatology
Robert M. Joeckel <sup>2</sup>	Assistant Professor	0.50	0.50			Geology/Regional Sedimentology and Stratigraphy
Ron J. Johnson	Professor	0.31	0.69			Wildlife Science
Scott J. Josiah <sup>1</sup>	Associate Professor	0.25	0.75			Forestry
Cody L. Knutson <sup>2</sup>	Assistant Geoscientist				1.00	Water Resources
Robert D. Kuzelka <sup>1</sup>	Associate Professor	0.58	0.26	0.16		Water Sciences
Susan Lackey <sup>2</sup>	Geoscientist	0.30	0.70			Groundwater Geology
Xiaomao Lin	Assistant Professor	0.80	0.20			Atmospheric Scientist
James W. Merchant	Professor	0.60		0.40		Geographic Information Systems
Sunil Narumalani <sup>2</sup>	Associate Professor	0.40			0.60	Remote Sensing/GSI
Rick Perk <sup>2</sup>	Assistant Geoscientist				1.00	Remote Sensing/GSI/Earth Science Education
Edward J. Peters <sup>1</sup>	Professor	0.25		0.75		Fisheries
Larkin A. Powell	Assistant Professor	0.40		0.60		Conservation Biology/Animal Ecology

<sup>1</sup>Ended research appointment during 2004-2005

<sup>2</sup>Began research appointment during 2004-2005

	Rank	Rsch	Ext	Tch	Other	Area of Responsibility
<b>School of Natural Resources (continued)</b>						
Karl Reinhard <sup>2</sup>	Professor	0.60	0.15		0.25	Human Dimensions, Environmental Archeology
Donald C. Rundquist	Professor	0.65		0.35		Remote Sensing
Michele M. Schoeneberge	Assistant Professor				USDA	Forestry
Patrick J. Shea	Professor	0.80	0.10	0.10		Environmental Chemistry of Xenobiotics
Steven Sibray <sup>2</sup>	Associate Geoscientist	0.75	0.25			Groundwater Geology
Rachel A. Simpson <sup>2</sup>	Assistant Professor	0.50				Natural Resources Data Specialist
Joseph M. Skopp	Associate Professor	0.50		0.50		Soil Physics
Daniel D. Snow	Assistant Professor	0.90		0.10		Hydrogeochemistry
Mary E. Spalding	Professor	1.00				Water Quality
Venkataramana Sridhar <sup>2</sup>	Research Assistant					
	Professor				1.00	Micrometeorology
Scott Summerside <sup>2</sup>	Associate Geoscientist	0.25	0.75			Groundwater Geology
Andrew E. Suyker <sup>2</sup>	Research Assistant					
	Professor				1.00	
James Swinehart <sup>2</sup>	Professor	0.85			0.15	Geology/Stratigraphy, Sedimentology
Jozsef Szilagyi <sup>2</sup>	Associate Professor	1.00				Water Science/Watershed Hydrology
Tsegaye Tadesse <sup>2</sup>	Assistant Geoscientist				1.00	Climatology
Brigitte Tenhumberg	Assistant Professor	0.50				Theoretical Ecology
Richard Andrew J. Tyre	Assistant Professor	0.60		0.40		Wildlife Population Ecology
Shashi B. Verma	Professor	0.85		0.15		Micrometeorology/Carbon Dioxide and Water Vapor Exchange
Elizabeth A. Walter-Shea	Professor	0.65		0.35		Agricultural Meteorology/Solar Radiation Interactions
David A. Wedin	Associate Professor	0.60		0.40		Ecology
Albert Weiss	Professor	0.85		0.15		Agricultural Meteorology
Donald A. Wilhite	Professor	0.90		0.10		Agricultural Climatology
C. William Zanner	Assistant Professor	0.60		0.10	0.30	Soil Geomorphology
Xinhua Zhou	Assistant Professor	1.00				Ecophysiological/Modeler

## Statistics

Walter W. Stroup	Professor	0.25		0.25	0.50	Chair, Statistical Consultant
Erin Blankenship	Associate Professor	0.55		0.45		Statistical Consultant
Kent Eskridge	Professor	0.60		0.40		Statistical Consultant
Stephen D. Kachma	Associate Professor	0.75		0.25		Statistical Consultant
David B. Marx	Professor	0.50		0.50		Statistical Consultant
Anne Parkhurst	Professor	0.50		0.50		Statistical Consultant



	Rank	Rsch	Ext	Tch	Other	Department (Area of Responsibility)
<b>Veterinary and Biomedical Sciences</b>						
John A. Schmitz <sup>2</sup>	Professor	0.41	0.15	0.20		Veterinary Pathology
Raul G. Barletta	Professor	0.90		0.10		Molecular Biology
Bruce W. Brodersen	Research Associate					
	Professor				1.00	Diagnostic Pathology
Michael P. Carlson	Lecturer				1.00	Analytical Toxicology
Jeffrey D. Cirillo	Associate Professor	0.85		0.15		Infectious Diseases
Subash C. Das <sup>1</sup>	Research Assistant					
	Professor				1.00	Molecular Virology
Alan R. Doster	Professor				1.00	Diagnostic Pathology
Gerald E. Duhamel	Professor	0.80		0.10	0.10	Diagnostic/Research Pathology
Roger W. Ellis	Lecturer				1.00	Beef Cattle Clinical Veterinarian
M. Rohan Fernando	Research Assistant					
	Professor				1.00	Molecular Biology/Biochemistry
Dicky D. Griffin	Professor	0.20	0.30	0.50		Beef Cattle Medicine
Clinton J. Jones	Professor	0.90		0.10		Molecular Virology
Clayton L. Kelling	Professor	0.65		0.35		Research Virology
Marjorie F. Lou	Professor	1.00				Research Biochemistry
Rodney A. Moxley <sup>2</sup>	Professor	0.90		0.10		Interim Head, Diagnostic/Research
						Pathology
Fernando A. Osorio	Professor	0.60			0.40	Diagnostic/Research Virology
Asit K. Pattnaik	Professor	1.00				Virology
Douglas G. Rogers	Professor	1.00				Diagnostic/Research Pathology
Gary P. Rupp	Professor	0.50	0.30	0.20		Director, GPVEC, Beef Cattle Medicine
Greg A. Somerville <sup>1</sup>	Assistant Professor	0.90		0.10		Microbiology
David J. Steffen	Associate Professor				1.00	Diagnostic Research Pathology
David R. Smith	Associate Professor	0.25	0.75			Dairy and Beef Cattle Health
Yange Zhang	Research Assistant					
	Professor	1.00				Molecular Biology
Joe Y. Zhou	Research Associate					
	Professor	1.00				Cell Biology/Bio-Imaging

<sup>1</sup>Ended research appointment during 2004-2005

<sup>2</sup>Began research appointment during 2004-2005

Rank		Rsch	Ext	Tch	Other	Department (Area of Responsibility)
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## Human Resources and Family Sciences Departments

### Family and Consumer Sciences

Julie M. Johnson	Professor	0.12	0.11		0.77	Chair
Douglas A. Abbott	Professor	0.25			0.75	Youth at Risk
Richard J. Bischoff	Associate Professor	0.25			0.75	Collaborative Health Care
Susan Churchill	Assistant Professor	0.25			0.75	Families' Economic Well-Being
Rochelle Dalla	Associate Professor	0.25			0.75	Migration
John D. DeFrain	Professor	0.25	0.75			Building Strong Families
Carolyn Edwards	Professor	0.25			0.75	Cultural Diversity/Early Childhood
Cathey Huddleston-Casas	Assistant Professor	0.25			0.75	Families' Economic Well Being
Li-Wen Lin <sup>1</sup>	Assistant Professor	0.25			0.75	Intergenerational Cultural Diversity
Kathy Prochaska-Cue	Associate Professor	0.25	0.75			Family Financial Management
Yan Xia	Assistant Professor	0.25			0.75	Risk and Resiliency of Youth

### Nutrition and Health Sciences

Marilyn Schnepf	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 <sup>1</sup>	Professor	0.50			0.50	Nutrition
Nancy M. Lewis	Professor	0.44			0.56	Nutrition
Kaye Stanek-Krogstr	Associate Professor	0.25			0.75	Nutrition
Janos Zempleni	Assistant Professor	0.50			0.50	Nutrition

### Textiles, Clothing and Design

Carol Thayer <sup>1</sup>	Professor		0.52		0.48	Interim Chair
Patricia Cox Crews	Professor	0.25			0.75	Textile Conservation and Science
Shirley M. Niemeyer	Professor	0.25	0.75			Home Environment
Yiqi Yang	Professor	0.35		0.50	0.15	Textile Sciences



Rank	Rsch	Ext	Tch	Other	Department (Area of Responsibility)
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## Off-Campus Research Centers

### Northeast Research and Extension Center

John F. Witkowski	Professor	0.25	0.75		Director
Michael C. Brumm	Professor	0.50	0.50		Animal Science (Swine Production)
Thomas E. Hunt	Associate Professor	0.50	0.50		Entomology (Entomologist)
Stevan Knezevic	Associate Professor	0.50	0.50		Agronomy and Horticulture (Weed Science)
William L. Kranz	Associate 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	Professor	0.50	0.50		Agronomy and Horticulture (Soils and Crop Nutrition)
David P. Shelton	Professor	0.50	0.50		Biological Systems Engineering (Soil Conservation)

### Panhandle Research and Extension Center

Charles A. Hibberd	Professor	0.45	0.55		Director
David D. Baltensperger	Professor	0.75	0.25		Agronomy/Horticulture (Crop Breeding)
Linda S. Boeckner <sup>2</sup>	Professor	0.25	0.75		Nutrition and Health Sciences (Nutrition and Dietetics)
Dillon M. Feuz	Professor	0.50	0.50		Agriculture Economics (Farm/Ranch Management)
Robert M. Harveson	Assistant Professor	0.50	0.50		Plant Pathology (Specialty Crop Disease)
Gary L. Hein	Professor	0.50	0.50		Entomology (Entomology)
Gary W. Hergert <sup>2</sup>	Professor	0.50	0.50		Agronomy/Horticulture
Drew J. Lyon	Professor	0.50	0.50		Agronomy/Horticulture (Dryland Crops)
Alexander D. Pavlista	Professor	0.25	0.75		Agronomy/Horticulture (Potatoes)
Patrick E. Reece	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)
Carlos A. Urrea <sup>2</sup>	Assistant Professor	0.75	0.25		Agronomy/Horticulture (Dry Bean Breeding)
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)

### West Central Research and Extension Center

Don C. Adams	Professor	0.50	0.50		Interim Director, Animal Science (Range Cattle Nutrition)
John B. Campbell	Professor	0.25	0.25		Entomology (Livestock/Crops)
Rick N. Funston	Assistant Professor	0.40	0.60		Animal Science (Reproductive Physiology)
Dale T. Lindgren	Professor	0.50	0.50		Agronomy and Horticulture (Ornamentals)
Jose' Payero	Assistant Professor	0.50	0.50		Biological Systems Engineering
David D. Tarkalson	Assistant Professor	0.50	0.50		Agronomy and Horticulture (Soils)
Jerry Volesky	Associate Professor	0.50	0.50		Agronomy and Horticulture (Range Management)
Gail A. Wicks <sup>1</sup>	Professor	0.50	0.50		Agronomy and Horticulture (Ecofarming/Weeds)

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Rank	Rsch	Ext	Tch	Other	Department (Area of Responsibility)
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## Interdisciplinary Activities

### Water Center

Kyle D. Hoagland	Professor	0.25		0.25	0.50	Director
J. Michael Jess	Lecturer				1.00	Acting Director

### Plant Science Initiative

Sally Mackenzie	Professor	0.60			0.40	Director, Plant Genomics
James R. Alfano	Associate Professor	0.88		0.12		Microbial Genetics
Han H. Asard	Associate Professor	0.46			0.54	Plant Biochemistry
Thomas Clemente	Assistant Professor	0.40			0.60	Plant Transformation
Michael Fromm	Professor	0.52			0.48	Biochemical Genetics
Steven Harris	Assistant Professor	1.00				Fungal Genetics
Julie M. Stone	Assistant Professor	0.63			0.37	Plant Molecular Biology

### Agricultural Research Division

Darrell W. Nelson <sup>1</sup>	Professor	1.00				Dean and Director
Majorie J. Kostelnik	Professor	0.12	0.13		0.75	Assistant Director
Nancy Betts <sup>1</sup>	Professor	0.50			0.5	Interim Associate Director

### Biotechnology Center

Michael Fromm	Professor	0.48			0.52	Director
Thomas Clemente	Associate Professor	0.60			0.40	Plant Transformation

### Center for Applied Rural Innovation

John Allen III <sup>1</sup>		0.04	0.30	0.01	0.65	Rural Society
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### Industrial Agricultural Products Center

Milford Hanna		0.25			0.75	Director
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### Center for Grassland Studies

Martin Massengale		0.25			0.75	Director
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<sup>1</sup>Ended research appointment during 2004-2005

<sup>2</sup>Began research appointment during 2004-2005



# Visiting Scientists and Research Associates

**T**he Agricultural Research Division hosted 51 visiting scientists and 30 research associates to the campus in 2004-2005. 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.

## Agronomy and Horticulture

*Visiting Scientist:* Ugur Bilgili  
*State/Country:* Turkey  
*Expertise/Discipline:* Buffalograss and line-leaved fescues research

*Visiting Scientist:* Willie Chishimba  
*State/Country:* Zambia  
*Expertise/Discipline:* Tissue culture in potatoes

*Visiting Scientist:* Seong-Soo Kang  
*State/Country:* Korea  
*Expertise/Discipline:* Monitoring crop stresses, especially nitrogen

*Visiting Scientist:* Tewodros Mesfin  
*State/Country:* Ethiopia  
*Expertise/Discipline:* Occasional tillage and starter fertilizer

## Animal Science

*Visiting Scientist:* Maria Lundesjö Ahnström  
*State/Country:* Sweden  
*Expertise/Discipline:* Meats

*Visiting Scientist:* Gloria Munoz  
*State/Country:* Spain  
*Expertise/Discipline:* Animal genetics

*Visiting Scientist:* Hans Stein  
*State/Country:* South Dakota/USA  
*Expertise/Discipline:* Protein and amino acid nutrition

*Visiting Scientist:* Mikaela Vuorisalmi  
*State/Country:* Finland  
*Expertise/Discipline:* Animal genetics

## Biological Systems Engineering

*Visiting Scientist:* Joseph Mpagalile  
*State/Country:* Tanzania  
*Expertise/Discipline:* Solar-powered, small-scale vegetable oil extraction system

*Visiting Scientist:* Cezar de Mello Mesquita  
*Country:* Brazil  
*Expertise/Discipline:* Soybean harvesting/reducing field losses

## Entomology

*Visiting Scientist:* Muhammad F. Chaudhury  
*State/Country:* Texas/USA  
*Expertise/Discipline:* Insect physiology

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

## Plant Pathology

*Visiting Scientist:* David Carter  
*State/Country:* Kansas/USA  
*Expertise/Discipline:* Molecular assessment

*Visiting Scientist:* Cafer Eken  
*State/Country:* Turkey  
*Expertise/Discipline:* Mycology and plant pathology

*Visiting Scientist:* Graciela Godoy-Lutz  
*State/Country:* Dominican Republic  
*Expertise/Discipline:* Plant pathology

*Visiting Scientist:* Sebastien Graziani  
*State/Country:* France  
*Expertise/Discipline:* Chlorella viruses

*Visiting Scientist:* Jigang Han  
*State/Country:* China  
*Expertise/Discipline:* Gene silencing

*Visiting Scientist:* Miki Kusano  
*State/Country:* Japan  
*Expertise/Discipline:* Plant tissue culture

*Visiting Scientist:* Govindappa Melappa  
*State/Country:* India  
*Expertise/Discipline:* Genetic engineering

*Visiting Scientist:* Ji-Young Min  
*State/Country:* Korea  
*Expertise/Discipline:* Fungal biochemistry

*Visiting Scientist:* Hyoun-Hyang Park  
*State/Country:* South Korea  
*Expertise/Discipline:* Plant molecular biology

*Visiting Scientist:* Koichi Toyama  
*State/Country:* Japan  
*Expertise/Discipline:* Plant transformation

*Visiting Scientist:* Paola Valbuzzi  
*State/Country:* Italy  
*Expertise/Discipline:* Chlorella viruses

## School of Natural Resources

*Visiting Scientist:* Russell Bigley  
*State/Country:* Colorado/USA  
*Expertise/Discipline:* Climate impacts, economic drought impacts in the West

*Visiting Scientist:* Xi Chen  
*State/Country:* China  
*Expertise/Discipline:* Hydrology

*Visiting Scientist:* Hyo Seop Cho  
*State/Country:* Korea  
*Expertise/Discipline:* Engineering technology

*Visiting Scientist:* Martin Dubrovsky  
*State/Country:* Czech Republic  
*Expertise/Discipline:* Atmospheric physics

*Visiting Scientists:* Scott A. Field  
*State/Country:* Australia  
*Expertise/Discipline:* Terrestrial ecology/ecological monitoring

*Visiting Scientist:* Jenny Grigg  
*State/Country:* Australia  
*Expertise/Discipline:* Cooperatives for community/economic development

*Visiting Scientist:* Fengqin Jiang  
*State/Country:* China  
*Expertise/Discipline:* Environmental ecology

*Visiting Scientist:* Jang-Eok Kim  
*State/Country:* Republic of Korea  
*Expertise/Discipline:* Environmental chemistry

*Visiting Scientist:* Je Han Kim  
*State/Country:* Korea  
*Expertise/Discipline:* Civil engineering

*Visiting Scientist:* Jong Sung Kim  
*State/Country:* Republic of Korea  
*Expertise/Discipline:* Environmental chemistry

*Visiting Scientist:* Grace Koshida  
*State/Country:* Canada  
*Expertise/Discipline:* Drought impacts, high-impact weather events

*Visiting Scientist:* Joo Heon Lee  
*State/Country:* Korea  
*Expertise/Discipline:* Civil engineering

*Visiting Scientist:* David Maidment  
*State/Country:* Texas/USA  
*Expertise/Discipline:* GIS in water resources, surface water hydrology

*Visiting Scientist:* Hyun Jin Park  
*State/Country:* Korea  
*Expertise/Discipline:* Hydraulic engineering

*Visiting Scientist:* Keith Paustian  
*State/Country:* Colorado/USA  
*Expertise/Discipline:* Soil and crop science

*Visiting Scientist:* Miroslav Trnka  
*State/Country:* Czech Republic  
*Expertise/Discipline:* Agricultural meteorology

*Visiting Scientist:* Zdenek Zalud  
*State/Country:* Czech Republic  
*Expertise/Discipline:* Agricultural meteorology

## Veterinary and Biomedical Sciences

*Visiting Scientists:* Ayala Livneh  
*State/Country:* Israel  
*Expertise/Discipline:* *Mycobacterium paratuberculosis*

*Visiting Scientists:* Sebastian Aguirre  
*State/Country:* Argentina  
*Expertise/Discipline:* Porcine reproductive respiratory syndrome virus (PRRSV)

*Visiting Scientists:* Marcelo de Lima  
*State/Country:* Brazil  
*Expertise/Discipline:* Veterinary virology

*Visiting Scientists:* Esther Alvarez Garcia  
*State/Country:* Spain  
*Expertise/Discipline:* Porcine respiratory and reproductive syndrome

*Visiting Scientists:* Stefan Löfgren  
*State/Country:* Sweden  
*Expertise/Discipline:* Effects of ultraviolet radiation on ocular tissues

## Family and Consumer Sciences

*Visiting Scientist:* Iftakar Hassan  
*State/Country:* Pakistan  
*Expertise/Discipline:* Reference to gender, rural development, clinical psychology, distance learning

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## Textiles, Clothing and Design

*Visiting Scientist:* Janet Evenson

*State/Country:* Illinois/USA

*Expertise/Discipline:* Textile science

*Visiting Scientist:* Wenlong Zhou

*State/Country:* China

*Expertise/Discipline:* Textile engineering

*Visiting Scientist:* Daesik Yun

*State/Country:* South Korea

*Expertise/Discipline:* Textile chemistry

*Visiting Scientist:* Abdus Salam

*State/Country:* Bangladesh

*Expertise/Discipline:* Textile chemistry

## Panhandle Research and Extension Center

*Visiting Scientist:* Carl Childers

*State/Country:* Florida/USA

*Expertise/Discipline:* Eriophyid mite study techniques

Each faculty member with an ARD appointment has a federally-approved research project. A number of faculty have multiple projects. There are 309 research projects that were active for all or part of the 2004-2005 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 52 multi-

state research projects in which they conduct cooperative research with scientists at other universities, addressing problems of regional and national importance. They also participate in approximately 49 multi-state 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 2004-2005.

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 (multi-state)	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
Cooperative Agreement		ca
Other Grant		og

**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 (multi-state):** 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.

**Cooperative Agreement:** Funds from USDA agencies other than CSREES.

Agricultural/  
Natural  
Resources Units

Agricultural  
Economics

**10-132\*      hm**  
Agricultural water management technologies, institutions and policies affecting economic viability and environmental quality (R.J. Supalla)

**10-138      ha**  
Measurement of competitiveness of U.S. beef, soybean, wheat, and corn production (L.E. Fulginiti)

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

**10-141      ha**  
Legal aspects of Nebraska agricultural and natural resources policy (J.D. Aiken)

**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)

**10-148      hm**  
Impact analysis and decision strategies for agricultural research (R.K. Perrin)

**10-149      ha**  
Enhancing public understanding of the U.S. beef market through industrial organization research and education (A.M. Azzam)

**10-150      ha**  
Economic analysis of Nebraska cropping systems (G.A. Helmers)

**10-151      ha**  
Economic impacts of changes in trade arrangements, bio-terrorism threats and renewable fuels requirements on U.S. grain and oilseed sector (D.M. Conley)



**10-152 ha**  
Strategic behavior and optimal regulation in industrialized agricultural markets: patents, biotechnology and organic agriculture (A.Yiannaka)

**10-153 ha**  
Analysis of agricultural real estate market dynamics in Nebraska (B.B. Johnson)

**10-154 hm**  
NC-1016, Economic assessment of changes in trade arrangements, bio-terrorism threats and renewable fuels requirements on U.S. Grain and Oilseed Sector (D.M. Conley)

**10-155 ha**  
Vertical integration, contract coordination and market power in agricultural raw product market (J. Royer)

**10-156 ha**  
Economic analysis of international agricultural trade issues before the World Trade Organization (E.W. Peterson)

**10-157 hm**  
W-1190, Interfacing technological, economic, and institutional principles for managing inter-sector mobilization of water (R. Supalla, D. Martin)

**13-157 hm**  
NC-1119, Management systems to improve the economic and environmental sustainability of dairy enterprises (H.D. Jose)

## Agricultural Leadership, Education and Communication

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

**24-035 st**  
Surveying and characterizing distance education interventions in Nebraska rural communities (J.W. King)

**24-036 st**  
Relationship of servant leadership to other leadership theories and role in explaining follower behavior and organizational effectiveness in NE (D.W. Wheeler)

## Agronomy and Horticulture

**12-002 ha**  
Genetics, breeding and evaluation of winter small grains crops for Nebraska (P.S. Baenziger, B.E. Beecher)

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

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

**12-204 hm**  
NC-202, Characterizing weed population variability for improved weed management decision support systems to reduce herbicide use (J.L. Lindquist, S.Z. Knezevic)

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

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

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

**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.L. Graef)

**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 and grain sorghum (S.C. Mason)

**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)

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

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

**12-275 hm**  
NC-213, Marketing and delivery of quality cereals and oilseeds (B. Beecher)

**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)

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

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

**12-283 ha**  
Utilizing biotechnology for sorghum and pearl millet improvement (I.M. Dweikat)

**12-286 og**  
Application of geospatial and precision technologies (A. Dobermann, R.M. Caldwell, V.I. Adamchuk, R.B. Ferguson)

**12-288 ha**  
Identification and analysis of jasmonic acid signal transduction components in plants (P.E. Staswick)

**12-289 ha**  
Precise nutrient management in corn-based systems (A.R. Dobermann)

**12-290 ha**  
Relationship of organic phosphorus bioavailability and PH to plant growth, phosphorus uptake, and mycorrhizal establishment (M. Mamo)

**12-291 ha**  
Improved soil productivity and environmental quality on non-irrigated land in southeastern Nebraska (C.S. Wortmann)

**12-292 cg**  
Characterization of Ds transposition in the soybean genome (T.E. Clemente)

**12-293 hm**  
NC-218, Assessing nitrogen mineralization and other diagnostic criteria to refine nitrogen rates for crops and minimize losses (D.T. Walters)

**12-294 ha**  
Detection and assessment of genetic variation in economically important weed species (D.J. Lee)

**12-295 st**  
Soil and water management for improving sorghum production in eastern Africa (C.S. Wortmann, M. Mamo)

**12-296 ha**  
Cultural practices to minimize environmental stress on horticultural crop production (L. Hodges)

**12-297\* ha**  
Improving the end-use performance characteristics of wheat and other cereal grains (B. Beecher)

**12-298 ha**  
Development of a transposon tagging system for soybean (Glycine max Merr) (T.E. Clemente)

**12-299 ha**  
Development of stress resistant/high yield sorghum germplasm for release and use in investigation of contributing physiological mechanisms (J.D. Eastin)

**12-301 cg**  
Pollution and economic decision support tool for impaired watershed management plans in Eastern Nebraska (D. Ginting, G.A. Helmers, M. Mamo, C. Wortmann, B. Eghball)

**12-302 ha**  
Proteomic dissection of the mitochondrial DNA metabolism apparatus in *arabidopsis* (S.A. Mackenzie)

**12-303 ha**  
Investigating the relationship between leaf re-greening and leaf senescence in a novel model system (E.T. Paparozzi)

**12-304 ha**  
Development of a transformation system for sorghum (Sorghum bicolor L.) (I. Dweikat, T. Clemente)

**12-305** **cg**  
The genetic basis of agronomic traits controlled by chromosome 3A in wheat (S. Baenziger, K. Eskridge, I. Dweikat)

**12-306** **st**  
A phenological network for ecological viticulture (P. Read, F. Baxendale, J. Hruskoci, J. Peake, J. Schold, B. Ramamurthy, J. Watkins, C. Zanner)

**12-307** **ha**  
Seasonal dynamics of annual forage crops to enhance grazing livestock systems (B. Anderson)

**12-308** **ha**  
Turfgrass Landscape BioSensing (G. Horst)

**12-309** **ha**  
Improving efficiency of corn breeding and developing alternative breeding methods (K. Russell)

**20-040** **hm**  
W-150, Genetic improvement of beans (*Phaseolus vulgaris* L.) for yield, disease resistance and food value (J. Steadman)

**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)

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

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

**34-001** **ha**  
Mechanisms of Plant Cell Signaling (M.E. Fromm)

**44-065** **hm**  
Conservation, management, enhancement and utilization of plant genetic resources (K. Vogel, D. Baltensperger)

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

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

**48-029** **ha**  
Resource-efficient cropping systems research for South Central Nebraska's irrigated agro-ecological zone (R.W. Elmore)

## Animal Science

**13-055\*** **hm**  
NE-127, Biophysical models for poultry production systems (M.M. Beck)

**13-110** **hm**  
NC-131, 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)

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

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

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

**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)

**13-153** **ha**  
Measuring and improving the quality, consistency, and uniformity of traits that influence meat value (C.R. Calkins, R.W. Mandigo)

**13-154** **ah**  
Role of paracrine growth factors in bovine ovarian follicular development (A.S. Cupp)

**13-156** **hm**  
W-112, Reproductive performance in domestic ruminants (A.S. Cupp)

**13-157** **hm**  
NC-1119, Management system to improve the economic and environmental sustainability of dairy enterprises (H.D. Jose, T. Klopfenstein)

**13-158** **hm**  
S-1008, Genetic selection and cross-breeding to enhance reproduction and survival of dairy cattle (J.F. Keown)

**13-159** **ha**  
Transcriptional regulation of the porcine gonadotropin releasing hormone (GnRH) receptor gene (B.R. White)

**13-161** **ha**  
Genetic variation in feed energy utilization (M.K. Nielsen)

**13-162** **hm**  
NC-1004, Genetic and functional genomic approaches to improve production and quality of pork (R.K. Johnson, D. Pomp, J.S. Weber)

**13-163** **ha**  
Improving profitability and sustainability of beef feedlot production through nutrient management and corn milling co-product utilization (G.E. Erickson)

**13-164** **ha**  
Alternative growing-finishing beef systems (T.J. Klopfenstein)

**13-165\*** **st**  
Role of hyaluronan during the ovulatory process in the beef cow (A.S. Cupp, M.A. Simpson)

**13-166** **cg**  
Transcriptional regulation of the porcine GnRH receptor gene (B.R. White)

**13-167** **ha**  
A genetic approach to uncovering mammalian genes important in sepsis induced multiple organ failure (J.S. Weber)

**13-168** **og**  
Validating and implementing *Listeria Monocytogenes* controls in ready to eat meat products produced by rural meat plants in the Great Plains (D. Burson, H. Thippareddi)

**13-169\*** **ha**  
Evaluating heat stress effects on reproduction in laying hens (M.M. Beck, R.J. Kittok)

**13-170** **ha**  
Expression analysis of GnRH stimulated pituitary genes in lines of swine divergent for ovulation rate (B.R. White)

**13-171** **hm**  
NE-1022, Poultry production systems: Optimization of production and welfare using physiological, behavioral and physical assessments (M. Beck)

**13-172** **ah**  
Metabolic bone disease in laying hens: Etiology and genomics (M. Beck)

**13-173** **ha**  
Management systems to increase profit potential in the cow-calf enterprise using forages and grain co-products (R. Rasby)

**13-174** **ha**  
Impact of animal welfare guidelines for laying hen cage space allowance on laying hen in a cage system (S. Scheideler)

**13-175** **st**  
Impact of biotin supplementation on early embryonic development (B. White, J. Zempleni)

**13-176** **ha**  
Physiological responses of growing calves to stable fly bites (D. Brink)

**31-006\*** **sg**  
Integrated crop/livestock/agroforestry research for sustainable systems in Nebraska (T.J. Klopfenstein, J.R. Brandle, C.A. Francis, D.T. Walters)

## Biochemistry

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

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

**15-092\*** **st**  
Plant Proteomics (J.P. Markwell, R. Cerny, S. Madhavan, G. Sarath, M.G. Zeece)

**15-096** **cg**  
Rubisco selection and correction (R.J. Spreitzer)

**15-098** **ha**  
Genetic modification of chloroplast rubisco (R.J. Spreitzer)

**15-099** **st**  
Engineering plants for increased photosynthetic efficiency: introduction of the CO<sub>2</sub> concentration mechanism from C<sub>4</sub> plants into C<sub>3</sub> plants (D.P. Weeks, T. Clemente)

**15-100** **hm**  
NC-1142, Regulation of photosynthetic processes (R. Chollet, J. Markwell, R.J. Spreitzer)

**15-101 ha**  
Variation C metabolism in plants: biochemical and physiological characterization of cytochromes b561 (H. Asard)

**15-102 ha**  
Transcriptional regulation of programmed cell death (PCD) in plant development and response to pathogens (J.M. Stone)

**15-103 ha**  
Biochemistry of anaerobic CO<sub>2</sub> fixation and chlorophenol metabolism (S.W. Ragsdale)

**15-104 ha**  
Regulation of the multifunctional proline utilization A (Put A) flavoprotein and proline metabolism in bacteria (D.F. Becker)

**15-105 ha**  
Directed evolution of plant foremate dehydrogenase (J.P. Markwell)

**15-106 st**  
Role of hyaluronan matrix in prostrate cancer progression (M.A. Simpson)

**15-107 ha**  
Evolution of animal lentiviruses/HIV (C. Wood)

**15-108 ha**  
Regulatory mechanisms of glutathione metabolic enzymes (J. Barycki)

**15-109 ha**  
Mammalian copper transporters and systemic copper homeostasis (J. Lee)

## Biological Systems Engineering

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

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

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

**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)

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

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

**11-122 og**  
Control of agrichemical loading to streams using grassed buffers in Great Plains watersheds (D.E. Eisenhauer, R.F. Spalding, T.G. Franti, D.D. Snow, M.G. Dosskey)

**11-123 ha**  
Improved acquisition of thematic soil maps (V.I. Adamchuk)

**11-124 ha**  
Storm runoff simulator to evaluate conservation buffers (T.G. Franti, D.P. Shelton, D.E. Eisenhauer, J.E. Gilley)

**11-125 hm**  
S-1007, The science and engineering for a biobased industry and economy (D. Jones, Y. Yang, M.A. Hanna, C.L. Weller)

**11-126 ha**  
Integrated research and extension education program addressing livestock air quality issues (R.M. Koelsch)

**11-127 cg**  
Purification process influences on structural and nutritional function of grain sorghum lipids (C. Weller, T. Carr, V. Schlegel, S. Cuppett, K. Hwang, L. Wang)

**11-128 ha**  
Adaptive management of groundwater supply systems using soft computing approaches (W. Woldt)

**11-129 hm**  
NE 1017, Developing and integrating components for commercial greenhouse production system (G. Meyer)

**11-130 ha**  
Improved prediction and measurement of crop evapotranspiration (S. Irmak)

**11-131 og**  
A national learning center for animal agricultural water quality issues (R. Koelsch, J. Harrison, M. Risse, F. Hammerik)

**11-132 ha**  
Three-dimensional volume blood flow measurements by ultrasonic feature tracking (G. Bashford)

## Entomology

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

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

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

**17-077\* hm**  
NC-226, Development of pest management strategies for forage alfalfa persistence (L.G. Higley, T.E. Hunt)

**17-078 ha**  
Plant resistance to sap-feeding insects (T.M. Heng-Moss)

**17-079 hm**  
Dynamic soybean pest management for evolving agricultural technologies and cropping systems (L.G. Higley, T.E. Hunt)

**17-080 ha**  
Mechanisms and management of arthropod injury to plants (L.G. Higley)

**17-081 ha**  
Conservation of insect predators of alfalfa insect pests using harvest management, vegetative landscape features, and artificial honeydew (S.D. Danielson)

**17-082 ha**  
Management of subterranean termites in urban/rural environments (S.T. Kamble)

**17-083 st**  
Synchronizing habitat enhancement practices with predator mobility for control of alfalfa insect pests (S.D. Danielson, J.R. Brandle, T.E. Hunt, E.E. Blankenship)

**17-084 ha**  
Host-plant resistance, insect-plant interactions, and insect genetics (J.E. Foster)

**17-085\* ha**  
Differential gene expression of barley in response to aphid injury (T.M. Heng-Moss, L.G. Higley, G. Sarath)

**17-086\* og**  
Development and delivery of user friendly IPM tools for use with PC and PDA (L.G. Higley, T.E. Hunt, W.W. Hoback, D.A. Golick)

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

## Food Science and Technology

**16-044 hm**  
NC-131, Molecular mechanisms regulating skeletal muscle growth and differentiation (M.G. Zeece)

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

**16-082 hm**  
NC 213, Management of grain quality and security in world markets (D.S. Jackson)

**16-083 hm**  
NC 213, Marketing and delivery of quality cereals and oilseeds (L.B. Bullerman)

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

**16-090 hm**  
S-295, Enhancing food safety through control of foodborne disease agents (C.L. Weller)

**16-094\* og**  
Second Governor's conference on ensuring meat safety *E. coli* 0157:H7 progress and challenges (R.W. Hutkins, A.K. Benson, R.A. Moxley)

**16-095 cg**  
HACCP training and research to assist meat processors with process deviations for lethality and stabilization (H. Thippareddi, D.E. Burson)

**16-096 cg**  
Population genomics of *Listeria monocytogenes* (A.K. Benson, M. Wiedmann)

- 16-097** **ha**  
Physical, chemical and biological control of molds and mycotoxins in foods and the environment (L.B. Bullerman)
- 16-098** **ha**  
Near infrared spectroscopic applications for food quality measurement and process control (R.L. Wehling)
- 16-099** **cg**  
Stability and functional activity of prebiotic oligosaccharides in foods (R.W. Hutkins, R.L. Wehling)
- 16-100** **og**  
Food safety: Life-long learning through teacher training (R.W. Hutkins, J.H. Rupnow, G. Whipple, H. Thippareddi, L. Durso)
- 16-102** **ha**  
Development of predictive models for the growth of foodborne pathogens in meat and poultry products (H. Thippareddi)
- 16-103** **ha**  
Development of metabolic profiling and metabolic fingerprinting as analytical tool for educating food safety and quality (H. Thippareddi, L. Wang, V.K. Juneja, C.L. Weller, C.N. Cutter, D.E. Burson)
- 16-104** **og**  
HACCP assistance to small and very small processors with development and validation of safe meat chilling processes (H. Thippareddi, L. Wang, V.K. Juneja, C.L. Weller, C.N. Cutter, D.E. Burson)
- 16-105** **ha**  
Evaluation of natural compounds, nutraceuticals, bioavailability and antioxidant activity in the CACO-2 cell model system (S. Cuppett)
- 16-106** **cg**  
Functional consequences of genome evolution in *Listeria monocytogenes* (A. Benson)
- 19-003** **st**  
Development and evaluation of food products, processes and markets (S. Taylor, D. Smith)
- 19-016\*** **sg**  
Midwest Advanced Food Manufacturing Alliance (S. Taylor)
- 19-017** **sp**  
Alliance for Food Protection (S. Hefle)

## Plant Pathology

- 21-022\*** **hm**  
Biocontrol of soil and residue-borne plant pathogens (G.Y. Yuen)
- 21-058\*** **hm**  
Persistence of *Heterodera glycines* and other regionally important nematodes (T.O. Powers)
- 21-064** **hm**  
NC-129, *Fusarium* mycotoxins in cereal grains (M.B. Dickman)
- 21-069** **ha**  
Characterization of wheat leaf rust virulence in Nebraska and its implication for breeding for resistance (J.E. Watkins)
- 21-070** **ha**  
Mitigation of diseases of dry edible bean and stem rot of soybean by managed plant resistance (J.R. Steadman)
- 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.J. Giesler)
- 21-081** **ha**  
Characterization and use of bacterial endophytes from cereals (A.K. Vidaver)
- 21-082\*** **ha**  
Detection and properties of Nebraska plant viruses with emphasis on soybean viruses (L.C. Lane)
- 21-083** **ha**  
Biological control of grass and cereal diseases in Nebraska (G.Y. Yuen)
- 21-084\*** **cg**  
Utilization of direct repeat induced gene silencing in plant functional genomics (A. Mitra)

- 21-085** **ha**  
The fungal response to genotoxic stress (S.D. Harris)
- 21-086** **cg**  
Chaperones of the type III protein secretion system of *Pseudomonas syringae* tomato DC 3000 (J.R. Alfano)
- 21-087\*** **hm**  
NC-504, Soybean rust: A new pest of soybean production (L.J. Giesler)
- 21-088** **st**  
The type 111 protein secretion system of *Psuedomonas syringae* tomato DC 3000 (J.R. Alfano)
- 21-089** **ha**  
Development of allergen free wheat using gene silencing (A. Mitra, S. Baenziger, T. Powers)
- 21-090** **hm**  
W-1186, Genetic variability in the cyst and root-knot nematodes (T.O. Powers)
- 21-091** **ha**  
Characterization of large algal viruses and their genes (J.L. VanEtten)
- 21-100** **st**  
Evaluation of airborne remote sensing and the advanced vegetation index suite for crop disease detection: The case of dry bean rust (J.R. Steadman)
- 21-101** **cg**  
Genomics of the necrotrophic fungal phytopathogen *Sclerotinia sclerotiorum* (M. Dickman)
- 21-102** **ha**  
Development of direct repeat induced gene (A. Mitra)
- 20-040** **hm**  
W-150, Genetic improvement of beans (*Phaseolus vulgaris* L.) for yield, pest resistance and food value (J.R. Steadman)
- 48-027\*** **ha**  
Microbial management of plant diseases in sustainable production systems: microbial diversity habitat receptivity and pathogen populations (J.P. Stack)
- 27-007** **ha**  
Drought: response and policy implications (D.A. Wilhite, M.J. Hayes)
- 27-012** **hm**  
NRSP-3, The national atmospheric deposition program (NADP) (S.B. Verma)
- 40-002** **ha**  
Remediating organic contaminants in soil and water through natural and accelerated destruction (S.D. Comfort)
- 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**  
Ecosystem consequences of woody species establishment in the Great Plains (D.A. Wedin)
- 40-008\*** **ha**  
Interannual and interdecadal variation of precipitation and temperature in Nebraska and surrounding states (Q. Hu)
- 40-011** **ms**  
Windbreak shelter effects (J.R. Brandle, L. Hodges, S.J. Josiah)
- 40-013** **ha**  
Rapid estimation of soil hydraulic properties (J.M. Skopp)
- 40-017** **ms**  
Impacts of *Pinus ponderosa* establishment on ecosystem functions in the Sandhills of Nebraska (T.N. Awada and D. Wedin)
- 40-018** **ha**  
Agrochemicals in Nebraska groundwater: occurrence, trends, and health associations (M. Exner-Spalding)
- 40-019** **ha**  
Evaluation and remediation of chemically compromised soil environments (P.J. Shea)
- 40-020** **ha**  
Development of an optimal conjunctive use plan during irrigation seasons for a Nebraska river valley (Xun Chen)
- 40-021\*** **ms**  
Epidemiology and control of pine wilt in Nebraska (M.O. Harrell)

## School of Natural Resources

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



<p><b>40-023 ha</b> Determining time of recharge (AGE) of groundwater resources in Nebraska using water chemistry and environmental isotopes (F.E. Harvey)</p> <p><b>40-024 st</b> State-wide groundwater resource assessment: focus on arsenic (D.C. Gosselin)</p> <p><b>40-025 st</b> Remote sensing of the biophysical characteristics of agricultural vegetation (R.C. Rundquist, A. Gitelson)</p> <p><b>40-026 ha</b> Landscape-level mechanisms influencing population dynamics of birds (L.A. Powell)</p> <p><b>40-027 ha</b> Radiative transfer in vegetative canopies with emphasis on canopy structure (E.A. Walter-Shea)</p> <p><b>40-028 ha</b> Improving the simulation of winter wheat (<i>Triticum aestivum</i> L.) responses to the environment (A. Weiss)</p> <p><b>40-029* ha</b> Drought effects on bird dispersal transmission in Nebraska wetlands (L.A. Powell)</p> <p><b>40-030* sg</b> Developing drought mitigation and preparedness technologies for the U.S. (D. Wilhite)</p> <p><b>40-031 st</b> Woody species expansion in the Nebraska Sandhills: Ecological and Socio-Economic consequences (T.N. Awada, A. Yiannaka, F.E. Harvey, X. Zhou, W. Schacht, S.J. Josiah)</p> <p><b>40-032 hm</b> NC-1005, Landscape ecology of white tailed deer in agroforest ecosystems: A cooperative approach to support management (S.E. Hygnstrom)</p> <p><b>40-033 cg</b> Drought monitoring, planning, and mitigation (D. Wilhite)</p> <p><b>40-034 ha</b> Characterization of land cover for improved numerical weather prediction modeling (J. Merchant, G. Henebry)</p> <p><b>40-035 hm</b> NC-1018, Impact of climate and soils on crop selection and management (K. Hubbard, S. Hu)</p>	<p><b>40-036 og</b> Drought monitoring planning and mitigation (D. Wilhite)</p> <p><b>40-037 ha</b> Identification of the triggering mechanisms of increased flood risk in the lower Missouri River (J. Szilagyi)</p> <p><b>40-038 ha</b> Decision-making for wildlife under severe uncertainty (A. Tyre)</p> <p><b>40-039 ha</b> Integrating biological diversity into managed land-use systems (R. Johnson)</p> <p><b>40-040 ha</b> Multidecadal alternation of sources affecting interannual summer rainfall variations in the central U.S. (S. Hu)</p> <p><b>40-041 st</b> Evolution, biomechanics and function in the teeth, jaws and skulls of insectivorous mammals (P. Freeman)</p>	<p><b>14-108 ah</b> Molecular genetic analysis of <i>Mycobacterium paratuberculosis</i> and related mycobacterial pathogens (R.G. Barletta)</p> <p><b>14-109 ha</b> Epidemiology of <i>Escherichia coli</i> 0157:H7 and <i>salmonella</i> in feedlot beef cattle (D.R. Smith, R.A. Moxley, T.J. Klopfenstein)</p> <p><b>14-115 hm</b> Porcine reproductive and respiratory syndrome (PRRRS) (F.A. Osorio, A. Pattnaik, R. Johnson, J. Weber)</p> <p><b>14-117* cg</b> Role of A/E proteins in <i>E. coli</i> 0157:H7 intestinal colonization of adult cattle (R.A. Moxley)</p> <p><b>14-118 ah</b> Pathobiology of porcine colonic spirochetosis caused by <i>Brachyspira pilosicoli</i> (G.E. Duhamel)</p> <p><b>14-119 cg</b> Functional genomic analysis of bovine viral diarrhea (R.O. Donis)</p> <p><b>14-120 cg</b> Mapping of <i>Mannheimia (pasteurella) haemolytica</i> leukotoxin binding site(s) on bovine CD18 (S. Srikumaran)</p> <p><b>14-121 hm</b> NC-107, Evolving pathogens, targeted sequences, and strategies for control of bovine respiratory disease (S. Srikumaran)</p> <p><b>14-122 cg</b> Functional analysis of bICPO, a bovine herpesvirus 1 gene that is a promiscuous trans-activator (C.J. Jones, Y. Zhang)</p> <p><b>14-123 og</b> Develop pre-harvest version of the USDA-FSIS fast antibiotic screening test and antibiotic residue avoidance education (D.D. Griffin)</p> <p><b>14-124* cg</b> Immunity against porcine reproductive and respiratory syndrome virus infections (F.A. Osorio, O.J. Lopez)</p> <p><b>14-125 hm</b> NC-1007, Enteric diseases of swine and cattle: prevention, control and food safety (R.A. Moxley, G.E. Duhamel, D.R. Smith)</p> <p><b>14-126 ah</b> Pathogenesis of bovine viral diarrhea virus and bovine respiratory syncytial virus infections (C.L. Kelling)</p>	<p><b>14-127 cg</b> Intervention strategies to reduce <i>Escherichia coli</i> 0157:H7 in beef feed-yards (D.R. Smith, G.E. Erickson, R.A. Moxley, T.J. Klopfenstein, S. Hinkley)</p> <p><b>14-128 cg</b> Regulation of the latency-reactivation cycle by the bovine herpesvirus (BHV-1) latency related gene (C.J. Jones, A.R. Doster)</p> <p><b>14-129 cg</b> Molecular analysis of a mycobacterium paratuberculosis colony-morphology attenuated mutant (R.G. Barletta)</p> <p><b>14-130 ah</b> Regulation of the latency reactivation cycle by the bovine herpesvirus 1 (BHV-1) latency related (LR) gene (C.J. Jones)</p> <p><b>14-131 st</b> Veterinary field disease research program (D.R. Smith)</p> <p><b>14-132 ha</b> Examination of attenuation and virulence determinants of porcine reproductive and respiratory syndrome virus (A. Pattnaik, F. Osorio)</p> <p><b>14-133 cg</b> Analyses of virulence and attenuation determinants of porcine reproductive and respiratory syndrome virus using reverse genetics approach (A. Pattnaik, F. Osorio)</p> <p><b>14-134 cg</b> Influence of exotoxins on virulence and colonization of the porcine intestine by <i>Escherichia coli</i> (R. Moxley)</p> <p><b>14-136 ha</b> Tricarboxylic acid cycle mediated regulation of staphylococcus aureus virulence factors (G. Somerville)</p> <p><b>14-137 st</b> Genetic basis of resistance to food-borne bacterial pathogen (G. Duhamel, J. Weber)</p> <p><b>14-138 cg</b> Functional analysis of bICPO, the major transcriptional regulatory gene of bovine herpesvirus (C.J. Jones)</p> <p><b>14-139 cg</b> Use of an eGFP-expressing strain of FRRSU for the study of viral pathogenesis and tropins (F. Osorio, A. Pattnaik)</p>
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## Statistics

- 23-001 st**  
Applications of statistics to research in agriculture (D.B. Marx, W.W. Stroup, A.M. Parkhurst, K.M. Eskridge)
- 23-003 hm**  
W-173, Stress factors of farm animals and their effects on performance (A.M. Parkhurst)

## Veterinary and Biomedical Sciences

- 14-039 st**  
VBMS research laboratories and animal care facility (J.A. Schmitz)
- 14-059 st**  
Veterinary diagnostic lab system: Diagnostic surveillance and disease investigation in Nebraska livestock and poultry (J.A. Schmitz, A.R. Doster)
- 14-103 ah**  
Pathogenic mechanisms of bacterial respiratory pathogens (J.D. Cirillo)

# Human Resources and Family Sciences Departments

## Family and Consumer Sciences

**92-036**      **ha**  
Outcomes in the collaborative management of mental health treatment within a primary care medical setting (R.J. Bischoff, C.W. Smith)

**92-037\***     **ha**  
Couple relationships in the latter half of life (L. Lin)

**92-038**      **ha**  
Great marriages: a qualitative study (J.D. DeFrain)

**92-039**      **ha**  
Risk and resiliency for substance abuse and behavioral health among immigrant adolescents in Nebraska (Y. Xia)

**92-040**      **ha**  
Redefining working poor: factors associated with the concurrence of work and unmet basic needs (C.A. Huddleston)

**92-041**      **hm**  
NC-1011, Rural low income families: tracking their well-being function in an era of welfare reform (K. Prochaska-Cue, S.L. Churchill)

**92-042**      **ha**  
Individual, familial and community factors impacting the psycho-social well-being of rural immigrant Latinos and their non-Hispanic peers (R.L. Dalla)

**92-043**      **ha**  
Parent engagement and child learning birth to five (C.P. Edwards)

**92-058**      **st**  
Attitudinal and behavior factors related to adolescent sexual abstinence (D.A. Abbott)

## Nutritional Science and Dietetics

**91-045**      **hm**  
NC-219, Using stages of change model to promote consumption of grains, vegetables and fruits by young adults (N.M. Betts)

**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.L. Hamouz)

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

**91-053**      **ha**  
The essential role of biotin in cell proliferation (J. Zempleni)

**91-056**      **hm**  
W-1002, Nutrient bioavailability - phytonutrients and beyond (J.A. Driskell)

**91-057**      **ha**  
Regulatory mechanisms of intestinal cholesterol absorption (T.P. Carr)

**91-058**      **hm**  
NC-1167, N-3 polyunsaturated fatty acids and human health and diseases (N.M. Lewis)

**91-059**      **ha**  
Dietary quality and BM1 and the influence of the parent-child relationship and ethnicity of young children on these variables (K.L. Stanek-Krogstrand)

**91-060**      **ha**  
Identification and characterization of grain sorghum, lipid compounds responsible for lowering cholesterol levels in hamsters (T.P. Carr, V.L. Schlegel, C.L. Weller, S.L. Cuppett)

**91-061**      **ha**  
The use of inulin as a functional food ingredient (M. Schnepf)

## Textiles, Clothing and Design

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

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

**94-028**      **ha**  
Process and property investigations of fibers synthesized from Nebraska's agricultural products and by-products (Y. Yang)

**94-029**      **hm**  
New technologies for the utilization of textile materials (P. Crews)

**94-030**      **hm**  
New technologies for the utilization of textile materials (Y. Yang)

**94-031**      **ha**  
Housing issues in Nebraska communities: Older population needs (S. Niemeyer)

## Off-Campus Research Centers

## Northeast Research and Extension Center

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

**42-024**      **ha**  
Environmentally sound utilization of 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)

**42-028**      **hm**  
NC-205, Ecology and management of European corn borer and other stalk-boring lepidoptera (T.E. Hunt)

**42-029**      **ha**  
Conservation buffer designs, establishment, growth, and performance (D.P. Shelton)

**42-030**      **ha**  
Management causes of variation in the wean-to-finish growth process of pigs (M. Brumm)

## Panhandle Research and Extension Center

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

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

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

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

**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 in 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.M. Blumenthal)

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

**44-062      ha**  
Improvement of proso millet and other crops for adaptation to western Nebraska (D.D. Baltensperger)

**44-063      ha**  
Irrigation management with limited water supplies (C.D. Yonts)

**44-064      hm**  
W-1177, Enhancing the competitiveness of U.S. meats (D.M. Feuz, C.R. Calkins)

**44-065      hm**  
NC-007, Conservation, management, enhancement and utilization of plant genetic resources (D.D. Baltensperger, K.P. Vogel)

**44-066      st**  
Interactions among life-forms in secondary succession on restored wetlands (P.E. Reece, J. Johnson, R.A. Tyre, E.E. Blankenship, A.E. Koehler, A. Cariveau, C. Carmine, G. Steinauer)

**44-067      ha**  
Planting and harvesting systems for sugarbeets, dry edible beans and chicory (J. Smith, M. Kocher)

**44-068      ha**  
Improving fertilizer management and recommendations for precision agriculture (G. Hergert)

**43-075      sg**  
Genetic variability of field populations of wheat curl mite and the impact on virus epidemiology (G.L. Hein)

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

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

## West Central Research and Extension Center

**43-065\*      ha**  
Integrated weed management in reduced tillage systems in low rain-fall environments (G.A. Wicks)

**43-066      ha**  
Selection, development and propagation of native herbaceous landscape plants (D.T. Lindgren)

**43-068\*      ha**  
Improving fertilizer management and recommendations for precision agriculture (G.W. Hergert)

**43-069\*      ha**  
Environmental impact of land application of animal manure as fertilizer for irrigated corn (J.O. Payero, S. Ensley, G.W. Hergert)

**43-070      hm**  
S-1005, Sources, dispersal and management of stable flies on grazing cattle and dairy cattle (J.B. Campbell)

**43-071      ha**  
Improving irrigation management to conserve water resources in west central Nebraska (J.O. Payero)

**43-072      ha**  
Soil nutrient and manure management for crop production in west central Nebraska (D.D. Tarkalson)

**43-073      ha**  
Enhancing reproductive efficiency in beef cattle (R.N. Funsten)

**43-074      ha**  
Nutritional management systems for grazing beef cattle (D.C. Adams)

**43-076      ha**  
Grazing management strategies and forage systems for western Nebraska (J.D. Volesky)

## Interdisciplinary Activities

### Administration

**01-001**  
General administration of federal fund research (D.W. Nelson)

**01-004      hm**  
Multistate research coordination, North Central Region (D.W. Nelson)

## Agricultural Research and Development Center

**45-001      st**  
Field laboratory development (D.J. Duncan)

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

## Center for Biotechnology

**34-001      ha**  
Mechanisms of plant cell signaling (M.E. Fromm)

## Center for Grassland Studies

**33-001      st**  
Center for Grassland Studies (M.A. Massengale)

**33-003      hm**  
NC-1020, Beef cattle grazing systems that improve production and profitability while minimizing risk and environment impacts (T. Klopfenstein)

**33-004      hm**  
NC-1021, Nitrogen cycling, loading and use efficiency in forage-based livestock (W. Schacht, T. Klopfenstein)

## Food Processing Center

**19-003      st**  
Development and evaluation of food products, processes and markets (S.L. Taylor)

**19-013\*      sg**  
Midwest Advanced Food Manufacturing Alliance (S.L. Taylor)

**19-015      sg**  
Midwest Advanced Food Manufacturing Alliance (S.L. Taylor)

**19-016      sg**  
Midwest Advanced Food Manufacturing Alliance (S.L. Taylor)

**19-017      sg**  
Alliance for Food Protection (S. Hefle)

## Industrial Agricultural Products Center

**29-012\*      sg**  
Industrial Agricultural Products Center (M.A. Hanna)

**29-013      og**  
Post award management of biomass R & D Initiative projects (M.A. Hanna)

## Plant Science Initiative

**35-001      cg**  
Mitochondria and Chloroplasts Gordon Conference (S.A. Mackenzie)

## Sustainable Agriculture Research and Education (SARE) Program

**32-007\*      sg**  
North Central Region Sustainable Agriculture Research and Education Program (W. Wilcke)

**32-008      sg**  
North Central Region Sustainable Agriculture Research and Education Program (W. Wilcke)

**32-009      og**  
Soil science and forest health management research-natural resources facility (D. Vanderholm)

**32-010      sg**  
FY02 NCR SARE Plan of Work (W. Wilcke)

**32-011      sg**  
North Central Region Sustainable Agriculture Research and Education Program (W. Wilcke)

**32-012      sg**  
North Central Region Sustainable Agriculture Research and Education Program (W. Wilcke)

**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 six 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 2004-05. 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 disserta-

## Journals in which faculty have published during 2005

### Agricultural Economics

AgBio Forum  
Agribusiness: An International Journal  
Agricultural Economics  
American Journal of Agricultural Economics  
Applied Engineering in Agriculture  
Ecological Economics  
Information Economics and Policy  
Journal of Agricultural and Resource Economics  
Journal of Productivity Analysis  
Nebraska Law Review

### Agricultural Leadership, Education and Communication

Journal of Agricultural Education  
Journal of Leadership Education  
Psychological Reports

## Agronomy and Horticulture

Agricultural and Forest Meteorology  
Agricultural Systems  
Agroforestry Systems  
Agronomy Journal  
Biochemica et Biophysica Acta  
Canadian Journal of Plant Sciences  
Cereal Chemistry  
Climate Research  
Crop Science  
Ecological Modeling  
Environmental and Experimental Botany  
Euphytica  
Field Crops Research  
Genome  
HortScience  
International Journal of Systematic and Evolutionary Microbiology  
Journal of Dairy Science  
Journal of Economic Entomology  
Journal of Environmental Quality  
Journal of Nutrition  
Journal of Plant Nutrition  
Journal of Range Management  
National Academy of Science  
Physiological and Molecular Plant Pathology  
Planta  
Plant Cell  
Poultry Science  
Precision Agriculture  
Rangeland Ecology Management  
Scientia Horticulturae  
Soil Science Society of America Journal  
Theoretical and Applied Genetics



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Transactions of the American Society of Agricultural  
Engineering  
Weed Science  
Weed Technology

## Animal Science

Animal Reproduction Science  
Applied and Environmental Microbiology  
Applied Animal Behaviour Science  
Australian Journal of Agricultural Research  
Crop Science  
Dairy Science  
Epidemiology Infection  
European Journal of Nutrition  
Genetics  
Genetics and Molecular Research  
Journal of Animal Science  
Journal of Dairy Science  
Journal of Environmental Quality  
Livestock Production Science  
Mammalian Genome  
Obesity Research  
Poultry Science  
Statistical Applications in Genetics and Molecular Biology  
Tecnica Pecuaria en Mexico  
The Professional Animal Scientist  
Vaccine

## Biochemistry

Applied Environmental Microbiology  
Biochemical and Biophysical Research Communications  
Biochemistry  
Journal of Biological Chemistry  
Journal of Experimental Botany  
Journal of Medical Microbiology  
Physiologia Plantarum  
Planta  
Poultry Science

## Biological Systems Engineering

Agronomy Journal  
Applied Engineering in Agriculture  
Carbohydrate Polymers  
Cereal Chemistry  
Computers and Electronics in Agriculture  
Energy and Fuels  
Engineering in Agriculture  
Food Science and Biotechnology  
Industrial Crops and Products  
Journal of American Oil Chemists Society  
Journal of Applied Polymer Science  
Journal of Environmental Quality

Journal of Food Processing Engineers  
Journal of Food Science  
Journal of Polymers and the Environment  
Precision Agriculture  
Scientia Horticulturae  
Starke  
Transactions of the American Society of Agricultural  
Engineers

## Entomology

Agronomy Journal  
Brasilia  
Comparative Biochemistry and Physiology  
Journal of Economic Entomology  
Journal of Entomological Science  
Journal of Medical Microbiology  
Journal of Pest Management Science  
Journal of Invertebrate Pathology  
Chemosphere  
Genome  
Medical and Veterinary Entomology  
Naturwissenschaften  
Parasitology International  
Pesticide Biochemistry and Physiology  
Scarabs  
The Florida Entomologist  
Zootaxa

## Food Science and Technology

Applied and Environmental Microbiology  
Biochemica et Biophysica Acta  
Carbohydrate Polymers  
Cereal Chemistry  
Clinical and Experimental Allergy  
Current Microbiology  
Energy and Fuels  
Food Science and Biotechnology  
Industrial Crops and Products  
International Journal of Agriculture and Biology  
Journal of AOAC International  
Journal of Agricultural and Food Chemistry  
Journal of Allergy and Clinical Immunology  
Journal of the American Oil Chemists' Society  
Journal of Applied Polymer Science  
Journal of Bacteriology  
Journal of Food Process Engineering  
Journal of Food Protection  
Journal of Food Science  
Journal of Polymers and the Environment  
Planta  
Starke  
Transactions of the American Society of Agricultural  
Engineers

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## Plant Pathology

Agronomy Journal  
Annual Review Phytopathology  
Archives of Virology  
Biological Control  
Biotechnology Letters  
Canadian Journal of Plant Science  
Cellular Microbiology  
Crop Science  
InfoMusa  
Gene  
Genome  
Journal of Agriculture and Biology  
Journal of Agriculture of the University of Puerto Rico  
Journal of Bacteriology  
Journal of Biological Chemistry  
Journal of Experimental Botany  
Journal of General Virology  
Journal of Nematology  
Microbial Ecology  
Molecular Microbiology  
Molecular Plant-Microbe Interaction  
National Academy of Science USA  
Nucleic Acids Research  
Physiological and Molecular Plant Pathology  
Phytopathology  
Plant Disease  
Plant Journal  
Plant Physiology  
Virology

## School of Natural Resources

Agricultural and Forest Meteorology  
Agroforestry Systems  
Agronomy Journal  
American Meteorological Society  
Annals of Forest Science  
Canadian Journal of Forest Research  
Chemosphere  
Climate Research  
Computers and Electronics in Agriculture  
Condor  
Conservation Biology  
Crop Science  
Ecological Modelling  
Ecology  
Environmental and Experimental Botany  
Environmental Pollution  
International Journal of Agricultural Biology  
Field Crops Research  
Geophysical Research Letters  
Ground Water  
HortScience

IEEE Geoscience and Remote Sensing Letters  
International Journal of Climatology  
Journal of Agricultural Biology  
Journal of Applied Meteorology  
Journal of the American Water Resource Association  
Journal of Atmospheric and Oceanic Technology  
Journal of Climate  
Journal of Environmental Quality  
Journal of Insect Behavior  
Journal of HortTechnology  
Journal of Hydrology  
Journal of Hydrometeorology  
Journal of Kansas Entomological Society  
Journal of Plant Physiology  
Journal of Sustainable Agriculture  
International Journal of Climatology  
Langmuir  
Natural Hazards Review  
North American Agroforestry Systems  
Revista Brasileira de Agrometeorologia  
Theoretical and Applied Climatology  
Wildlife Society Bulletin

## Statistics

Agriculture, Ecosystems and Environment  
Crop Science  
Dairy Science  
Euphytica  
HortScience  
International Journal of Biometeorology  
Journal of Animal Science  
Journal of Economic Entomology  
Journal of Food Science  
Journal of Medical Microbiology  
Journal of Polymers  
Journal of the Kansas Entomological Society  
Journal of Virological Methods  
Nutrition Research  
Plant Disease  
Statistical Applications in Genetics and Molecular Biology  
Wildlife Society Bulletin

## Veterinary and Biomedical Sciences

American Journal of Respiratory Cell and Molecular Biology  
Annual Review of Microbiology  
Applied and Environmental Microbiology  
Biomedica  
Epidemiology and Infection  
Eukaryotic Cell  
Experimental Eye Research  
Food Animal Practice  
Foodborne Pathogens and Disease

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Infections and Immunity  
Investigative Ophthalmology and Visual Science  
Journal of Clinical Microbiology  
Journal of Medical Microbiology  
Journal of Veterinary Diagnostic Investigation  
Journal of Virological Methods  
Vaccine  
Veterinary Immunology Immunopathology

## **Human Resources and Family Sciences Departments**

### **Family and Consumer Sciences**

College Student Journal  
Contemporary Family Therapy  
Complexity of Family Life Among Low Income and  
Working Poor  
Gender and Society  
Journal of Family and Economic Issues  
Strengths and Challenges  
The American Journal of Family Therapy

### **Nutrition and Health Sciences**

Ecology of Food and Nutrition  
European Journal of Biochemistry  
Food Science Central  
Journal of the American Dietetic Association  
Journal of Food Science  
Journal of Nutrition  
Journal of Nutritional Biochemistry  
Journal of Nutrition Education and Behavior  
Nutrition in Clinical Care  
Nutrition Research  
Today's Dietitian

### **Textiles, Clothing and Design**

American Association of Textile Chemist and Colorist Review  
Coloration Technology  
Family and Consumer Sciences Research Journal  
Journal of Applied Polymer Science  
Journal of Textile Institute

## **Off-Campus Research Centers**

### **Northeast Research and Extension Center**

Agronomy Journal  
Applied Engineering in Agriculture  
Australian Journal of Agriculture Research  
International Journal of Biometerology  
Journal of Animal Science  
Weed Technology

### **Panhandle Research and Extension Center**

Crop Science  
Journal of Agricultural and Resource Economics  
Journal of Animal Science  
Journal of Rangeland Ecology and Management  
Journal of Sugar Beet Research  
Plant Health Progress  
Professional Animal Scientist  
Rangeland Ecology and Management  
Review of Agricultural Economics  
Weed Science  
Weed Technology

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

Agronomy Journal  
Applied Engineering in Agriculture  
Communications in Soil and Plant Analysis  
Journal of Animal Science  
Journal of Environmental Quality  
Journal of Range Management  
HortScience  
The Professional Animal Scientist

# Research Publications (2005)

## Agricultural/Natural Resources Units

## Agricultural Economics

### Journal Articles

- Aiken, J.D. 2004.  
The western common law of tributary ground water: Implications for Nebraska. *Nebraska Law Review* 83:541-595. (J. Series No. 14662)
- Azzam, A.M., E. Lopez, and R. Lopez. 2004.  
Imperfect competition and total factor productivity growth. *Journal of Productivity Analysis* 23:173-184. (J. Series No. 14300)
- Azzam, A.M. and S. Salvador. 2004.  
Information pooling and collusion: An empirical test. *Information Economics and Policy* 16:275-286. (J. Series No. 14299)
- Fulginiti, L.E., R.K. Perrin, and B. Yu. 2004.  
Institutions and agricultural productivity in sub-Saharan agriculture. *Agricultural Economics* 31:169-180. (J. Series No. 14353)
- Fulton M. and K. Giannakas. 2004.  
Inserting GM products into the food chain: The market and welfare effects of different labeling and regulatory regimes. *American Journal of Agricultural Economics* 86:42-60. (J. Series No. 14108)
- Giannakas K. and A. Yiannaka. 2004.  
The market potential of a new high-oleic soybean: An ex ante analysis. *AgBioForum* 7:101-112. (J. Series No. 14905)

- Hayes, W.M. and G.D. Lynne. 2004.  
Towards a centerpiece for ecological economics. *Ecological Economics* 49:287-301. (J. Series No. 13543)
- Klocke, N.L., J.P. Schneekloth, S.R. Melvin, R.T. Clark, and J.O. Payero. 2004.  
Field scale limited irrigation scenarios for water policy strategies. *Applied Engineering in Agriculture* 20:623-631. (J. Series No. 14312)

- Rezek, J. and R.K. Perrin. 2004.  
Environmentally adjusted agricultural productivity in the Great Plains. *Journal of Agricultural and Resource Economics* 29:167-184. (J. Series No. 14354)
- Schroeter, J.R. and A.M. Azzam. 2004.  
Captive supplies and cash market prices for fed cattle: The role of delivery timing incentives. *Agribusiness: An International Journal* 20:347-362. (J. Series No. 14301)

### Book Chapters

- Perrin, R.K. and L.E. Fulginiti. 2004.  
Dynamic pricing of GM crop traits, p. 183-189. *In: R. Evenson and V. Santaniello (eds.), The Regulation of Agricultural Biotechnology*. CABI Publishing, Wallingford, UK.
- Royer, J.S. 2004.  
Finance and taxation, p. 123-144. *In: C. Merrett and N. Walzer (eds.), Cooperatives and Local Development: Theory and Applications for the 21st Century*. M.E. Sharpe, Armonk, NY.
- Supalla, R.J., O. Yeboah, B. Klaus, J.C. Allen, D.E. Jelinski, V.B. Serveiss, and R.J.F. Bruins. 2004.  
Seeking solutions for an interstate conflict over water and endangered species: Platte river watershed, p. 291-340. *In: R. Bruins and M. Heberling (eds.), Economics and Ecological Risk Assessment: Applications to Watershed Management*. CRC Press, Boca Raton, FL.
- Yiannaka, A. 2004.  
The market and welfare effects of the new national organic program, p. 21-35. *In: G. Baourakis (ed.), Marketing Trends for Organic Food in the Advent of the 21st Century*. World Scientific Publishing Co., Singapore.

## Research Bulletin

- Clark, R.T., R.K. Wilson, D.C. Adams, J.D. Volesky, and R.E. Sandberg. 2004.  
Breeding and feeding management practices used by cow-calf producers in Western and North Central Nebraska. *Research Bulletin* 346. University of Nebraska Agricultural Research Division.

## Refereed Proceedings

- Adamchuk, V.I., C. Wang, D.B. Marx, R.K. Perrin, and A. Dobermann. 2004.  
Assessment of soil mapping value - potential profitability (Part II). *In: Mulla, D. (ed.), International Conference on Precision Agriculture and Other Resource Management Proceedings*. CD-ROM. Bloomington, MN.
- Conley, D.M., D. Larson, F. Declerck, and F. Braga. 2004.  
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The management challenge of team formation in an agribusiness. <http://www.ifama.org/conferences/2004Conference/default.htm>. *In: International Food and Agribusiness Management Association Annual Meeting Proceedings*, www.ifama.org. Montreux, Switzerland.

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Out of sample forecasting of agricultural land values, p.16-18. *In: Southeast Decision Sciences Institute Proceedings*, Charleston, SC.
- Shaik, S., G.A. Helmert, and J.A. Atwood. 2004.  
Agricultural policy impacts on land values, p. 19-21. *In: Southeast Decision Sciences Institute Proceedings*, Charleston, SC.

## M.S. Theses

- Guan, H. 2004.  
The impact on China's agricultural products imports from the United States after its accession to the WTO: A bilateral trade model analysis. (E.W.F. Peterson, Advisor)

- McCabe, L.G. 2004.  
Strategic and risk hedging in a Cournot duopoly with forward input contracts. (A.M. Azzam and A. Yiannaka, Advisors)
- Veyssiere, L. 2004.  
Strategic labeling and trade of GMOs. (K. Giannakas, Advisor)

## Agricultural Leadership, Education and Communication

### Journal Articles

- Barbuto, J.E., S.K. Trout, and L.L. Brown. 2004.  
Identifying the sources of motivation of adult rural workers. *Journal of Agricultural Education* 45:11-21. (J. Series No. 14285)
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- Fritz, S.M., A. Boren, and V. Egger. 2004.  
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- Gage, A.J., S. Mumma, and S.M. Fritz. 2004.  
Exploring the Bermuda Triangle: Review of gender, societal, team and individual leadership theories. *Journal of Leadership Education*. [www.fhsu.edu/jole/issues/JOLE\\_3\\_2.pdf](http://www.fhsu.edu/jole/issues/JOLE_3_2.pdf). (J. Series No. 14471)

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A review of gender and full-range leadership and suggestions for future research. *Journal of Leadership Education*. [www.fhsu.edu/jole/issues/JOLE\\_3\\_2.pdf](http://www.fhsu.edu/jole/issues/JOLE_3_2.pdf). (J. Series No. 14440)

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The effects of LMX and differential treatment on work unit commitment: Distinguishing between neutralizing and moderating effects. *Psychological Reports* 94: 495-500. (J. Series No. 13828)

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Barbuto, J.E. 2004.

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Barbuto, J.E. and D.W. Wheeler. 2004.

Putting some steak on the sizzle: Development and preliminary validation of new scales to measure servant leadership. *In: Eastern Academy of Management*, Providence, RI. [www.eaom.org](http://www.eaom.org).

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A framework to explain the role of leadership in the development and sustainability of hope. *In: 41st Annual Meeting of the Eastern Academy of Management*, Providence, RI. [www.eaom.org](http://www.eaom.org).

## Ph.D. Dissertations

Burbach, M.E. 2004.

Testing the relationship between emotional intelligence and full-range leadership as moderated by cognitive style and self-concept. (J.E. Barbuto, Advisor)

Trout, S.K. 2004.

Motivation as an antecedent to positive environmental behaviors of agricultural leaders. (J.E. Barbuto and C.A. Francis, Advisors)

Trudeau, D.A. 2004.

Toward a conceptual model of executive coaching practices in organizations in the United States: A modified delphi forecasting study. (D.W. Wheeler, Advisor)

## Agronomy and Horticulture

### Journal Articles

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Registration of N-Si-6, N-Si-7, N-Si8 foxtail millet germplasm. *Crop Science* 44:1030. (J. Series No. 14031)

Auclair, J., G. Boland, E. Cober, G. Graef, J. Steadman, J. Zilka, and I. Rajcan. 2004.

Development of a new inoculation technique to assess partial resistance in soybean to *Sclerotinia sclerotiorum*. *Canadian Journal of Plant Sciences* 84:57-64. (J. Series No. 14135)

Baenziger, P.S., B. Beecher, R. Graybosch, D. Baltensperger, L. Nelson, J. Krall, D. McVey, J. Watkins, J. Hatchett, and M.S. Chen. 2004.

Registration of 'Goodstreak' wheat. *Crop Science* 44:1473-1474. (J. Series No. 14024)

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Baenziger, P.S., G. McMaster, W. Wilhelm, W. Weiss, and C. Hayes. 2004.

Putting genetics into genetic co-efficients. *Field Crops Research* 90:133-143. (J. Series No. 14569)

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Budak, H., P.S. Baenziger, B. Beecher, R. Graybosch, B. Campbell, M. Shipman, M. Erayman, and K. Eskridge. 2004.

The effect of introgressions of wheat D-genome chromosomes into "Presto" triticale. *Euphytica* 137:261-270. (J. Series No. 14032)

Budak, H., R. Shearman, I. Parmaksiz, and I. Dweikat. 2004.

Application of sequence-related amplified polymorphism (SRAP) markers for characterization of turfgrass species. *HortScience* 39:955-958. (J. Series No. 14052)

Budak, H., R. Shearman, R. Gaussoin, and I. Dweikat. 2004.

Comparative analysis of seeded and vegetative biotype buffalograss based on phylogenetic relationship using ISSRs, SSRs, RAPDs, and SRAPs. *Theoretical and Applied Genetics* 109:280-288. (J. Series No. 14398)

Budak, H., R. Shearman, I. Parmaksiz, R. Gaussoin, T. Riordan, and I. Dweikat. 2004.

Molecular characterization of buffalograss germplasm using sequence-related amplified polymorphism markers. *Theoretical and Applied Genetics* 108:328-334. (J. Series No. 14046)

Campbell, B., P.S. Baenziger, K. Eskridge, H. Budak, N. Streck, A. Weiss, K. Gill, and M. Erayman. 2004.

Using environmental covariates to explain genotype x environments and QTL x environment interactions for agronomic traits on chromosome 3A of wheat. *Crop Science* 44:620-627. (J. Series No. 14053)

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Latitudinal adaptation of switchgrass populations. *Crop Science* 44:293-408. (J. Series No. 14184)

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Leaching and sorption of nitrogen and phosphorus by crop residue. *Transactions of the American Society of Agricultural Engineers* 47:113-118. (J. Series No. 13806)

Dobermann, A. 2004.

A critical assessment of the system for rice intensification (SRI). *Agricultural Systems* 79:261-281. (J. Series No. 14080)

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Geostatistical integration of yield monitor data and remote sensing improves yield maps. *Agronomy Journal* 96:285-297. (J. Series No. 14190)

- Eghball, B., D. Ginting, and J.E. Gilley. 2004. Residual effects of manure and compost applications on corn production and soil properties. *Agronomy Journal* 96:442-447. (J. Series No. 14066)
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- Frank, K., R. Gaussoin, T. Riordan, R. Shearman, J. Frey, E. Miltner, and J. Johnson. 2004. Nitrogen rate and mowing height effects on turf-type buffalograss. *Crop Science* 44:1615-1621. (J. Series No. 14034)
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Ferguson, R., A. Dobermann, C. Wortmann, D. Walters, C. Shapiro, D. Tarkalson, and D. Baltensperger. 2004.

Developing recommendations for site-specific nitrogen management of irrigated maize. *In*: *Proceedings of the 7th International Conference on Precision Agriculture and Other Resource Management*. CD-ROM. American Society of Agronomy-Crop Science Society of America-Soil Science Society of America, Madison, WI.

## M.S. Thesis

Bauer, B.D. 2004.

Yield and forage quality of cool and warm-season plant communities on subirrigated meadows. (J.D. Volesky and W.H. Schacht, Advisors)

## Ph.D. Dissertations

K.W. Creighton. 2004.

Heifer development systems for March-born heifers and improving pregnancy rates in June-calving cows. (D.C. Adams, Advisor)

Macedo, P.A. 2004.

Population profiles of stable flies from eastern Nebraska and the impact of weather variables on their seasonal trends. (J.B. Campbell and P.J. Scholl, Advisors)

ARD receives funding from federal formula funds, industry grants, federal grants and state appropriations. During fiscal year 2004-2005, faculty with ARD appointments obtained grant and contract funds that totaled \$46,527,606. This amount represents 35.8% 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, 2004 through June 30, 2005

<b>Federal Formula Funds:</b>	
Hatch Formula .....	\$ 2,284,736
Regional Research .....	\$ 878,693
McIntire-Stennis .....	\$ 174,720
Animal Health .....	\$ 149,363
<b>Total Federal Formula Funds .....</b>	<b>\$ 3,487,512</b>
<b>State-Appropriated Funds .....</b>	<b>\$33,381,998</b>
<b>Nebraska Research Initiative Funds .....</b>	<b>\$ 2,958,470</b>
<b>Contracts and Grants:</b>	
USDA Cooperative Agreements .....	\$ 1,327,668
USDA Special and Competitive Grants .....	\$ 5,639,827
Federal Grants - (NSF, NIH, USEPA, AID, DOE) .....	\$12,183,884
Industry Grants .....	\$ 9,582,891
<b>Total Grants and Contracts .....</b>	<b>\$28,734,270</b>
<b>Product Sales .....</b>	<b>\$11,402,414</b>
<b>Total Expenditures .....</b>	<b>\$79,964,664</b>

## Agricultural Research Division

### Research Investments by Category and Funding Source FY 2005

<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>
	<i>% of total within source</i>				
<b>Salaries, Wages and Benefits</b>					
Administrative/Faculty	40.4	9.4	7.4	3.4	22.6
Managerial/Professional	12.5	7.0	8.7	8.0	9.9
Office/Service	9.9	3.6	8.2	16.1	9.1
Hourly Wages	0.4	1.7	3.6	3.5	1.7
GRA Stipends	4.9	13.0	10.9	1.9	7.3
Benefits	15.0	7.8	8.5	7.9	11.3
<b>Subtotal:</b>	83.1	42.5	47.2	40.9	61.8
<b>Operating</b>					
Supplies and Expenses	9.6	52.6	43.5	46.5	30.4
Travel	0.7	2.4	5.1	3.4	2.1
Equipment	6.7	2.5	4.1	9.2	5.7
<b>Subtotal:</b>	16.9	57.5	52.8	59.1	38.2
<b>Total:</b>	100.0	100.0	100.0	100.0	100.0

## Agricultural Research Division Selected Research Program Information

Category	FY 2003	FY 2004	FY 2005
<b>Project Information:</b>			
Projects at beginning of year	386	371	330
Projects terminating	74	81	41
Projects revised	10	13	3
New projects	59	40	20
Projects at the end of the year	371	330	309
<b>Faculty full-time equivalents (FTE)</b>	124.5	126.5 <sup>1</sup>	131.9 <sup>2</sup>
<b>Expenditures for budgeted research faculty:</b>			
Federal formula and state approp., \$/FTE <sup>3</sup>	\$287,964	\$297,557	\$301,956
Grant and contracts, \$/FTE	\$186,794	\$211,728	\$217,849
Product sales, \$/FTE	\$ 76,562	\$ 76,147	\$ 86,447
<b>Outputs from research programs<sup>4</sup>:</b>			
Refereed journal articles	311	304	401
Research bulletins	0	3	5
Books and book chapters	38	69	88
M.S. and Ph.D. theses	108	120	145
Cultivars and germplasm released	35	15	30
Patents obtained	3	2	1

<sup>1</sup>Includes research FTE in Plant Science Initiative.

<sup>2</sup>Includes former Conservation and Survey faculty transferred to ARD appropriated account.

<sup>3</sup>Includes cost of administration and expenditures from the Nebraska Research Initiative by ARD-affiliated faculty.

<sup>4</sup>A large number of abstracts, technical reports, and other non-refereed articles also are published by faculty each year.



