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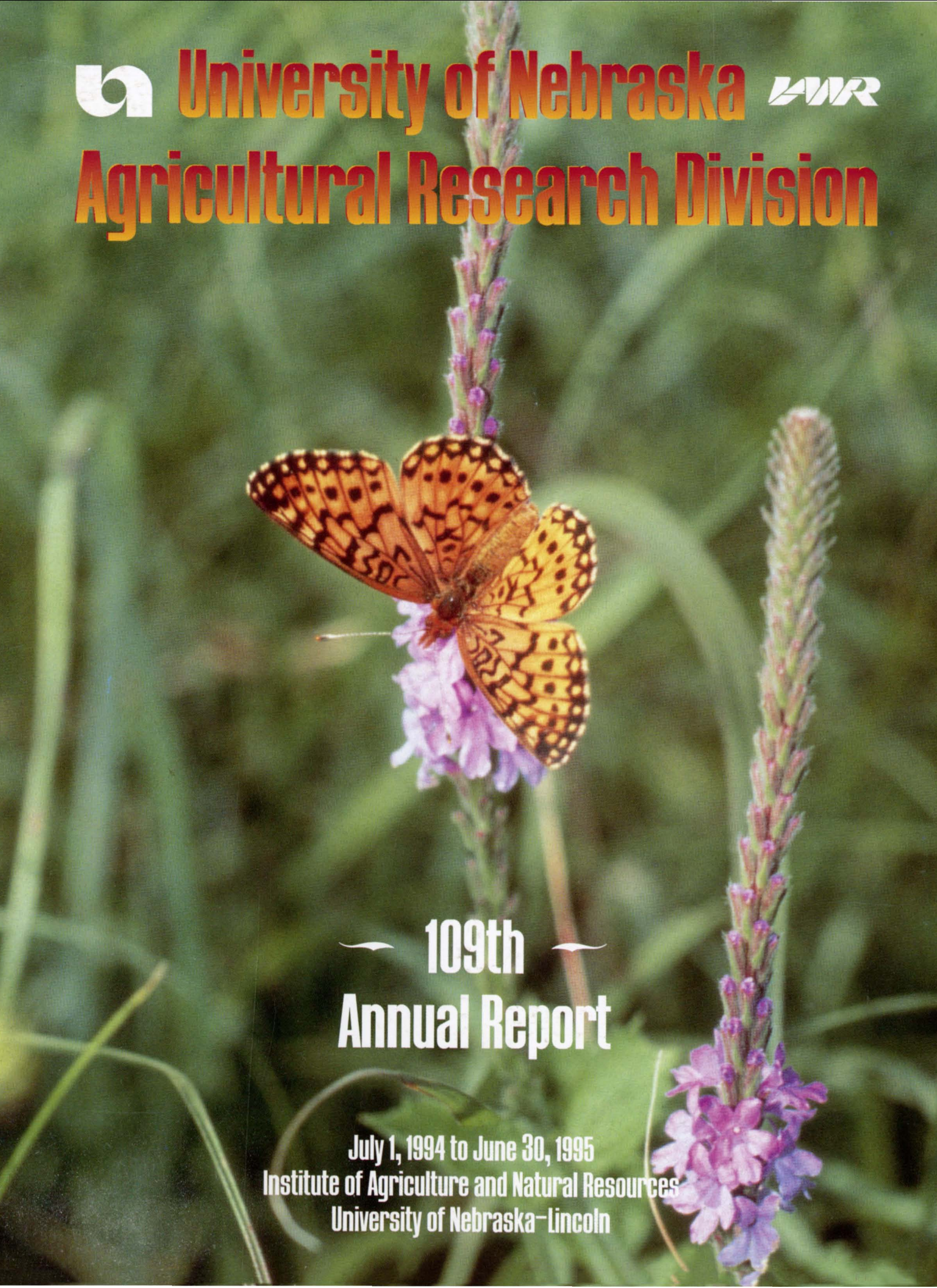
Agricultural Research Division 109th Annual Report 1995



University of Nebraska Agricultural Research Division

109th Annual Report

July 1, 1994 to June 30, 1995
Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln

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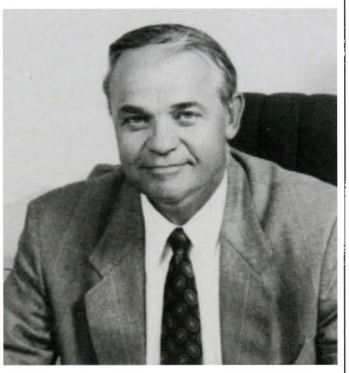
This publication is printed on recycled paper using soy ink.

Foreword



It is a pleasure to provide the 109th Annual Report of the University of Nebraska Agricultural Research Division (ARD). This report contains lists of current faculty, visiting scientists and research associates; active research projects; refereed journal articles, books and book chapters published; theses and dissertations written; germplasm/cultivars released; and awards received by faculty and graduate students. Also included are brief descriptions of accomplishments from selected research projects, information about the programmatic distribution of resources, and the financial report for the period July 1, 1994 to June 30, 1995.

This report was compiled in compliance with the intent of the law of the State of Nebraska that established the Nebraska Agricultural Experiment Station on March 31, 1887.

The mission of ARD is to conduct problem-solving and fundamental research that: (1) addresses priority issues facing Nebraska's agricultural and food industries; (2) provides a knowledge base for managing our natural resources that enhances the environment and ensures a sustainable base for food production; (3) promotes family well-being and community development; and (4) educates future scientists through hands-on experiences.

During the past five years, ARD has attempted to increase research investments related to biotechnology, value-added processing of agricultural commodities, natural resources including water science, human nutrition, integrated systems, rural policy analysis and efficient production of crops and livestock. These changes in emphasis were achieved by redirecting the research of continuing faculty and using vacancies to hire faculty with appropriate backgrounds. The ARD strategy has resulted in a more focused and strengthened program. Over this five year period, ARD grant and contract income increased by 58 percent, total research expenditures increased by 38 percent, written publications increased by 19 percent, students receiving advanced degrees increased by 18 percent, and the number of faculty decreased by 9 percent.

We are pleased that some of our facility needs have been addressed during the past few years. Cigarette tax funds were appropriated for swine research facilities at the West Central and Northeast Research and Extension Centers, a staff conference center at the Gudmundsen Sandhills Laboratory, a Research and Education Building at the Agricultural Research and Development Center (ARDC) , a research support building at the West Central Research and Extension Center, and a heating and cooling system upgrade for the Elliott Building at the Panhandle Research and Extension Center. Self-generated funds have been used to upgrade irrigation research facilities at the Panhandle, South Central, and Northeast Research and Extension Centers; improve cattle pens and working chutes at the Panhandle, Northeast and West Central Research and Extension Centers; enhance several research facilities at the ARDC, and fund a research support building at the Northeast Research and Extension Center. A partnership of federal, state and private funds were obtained to construct the George W. Beadle Center for Genetics and Biomaterials Research on the UNL campus.

It is increasingly important to effectively communicate research accomplishments to clientele. During the past few years, ARD has diligently sought to improve communications with the public through increased news releases; development and dissemination of *RESEARCH Nebraska!* and *Endeavors*, an ARD magazine and newsletter that highlight the breadth, diversity and accomplishments of ARD researchers; and enhanced visibility for our scientists. Hopefully, Nebraskans are more aware of the ARD research programs and the accomplishments of our scientists.

Readers of this annual report are encouraged to contact ARD with questions about our programs or to provide input regarding research needs. Bettering Nebraska's agriculture, environment, economic well-being and quality of life is the ultimate goal for ARD research programs.

Darrell W. Nelson
Dean and Director
Agricultural Research Division

Research Highlights

The Agricultural Research Division's diverse research endeavors represent a scientific investment in Nebraska's future. Nebraskans have long enjoyed high returns on their agricultural research investments. Current efforts by ARD scientists in the Institute of Agriculture and Natural Resources promise to continue yielding solid dividends.

Whether it's better understanding the needs of youth and families or finding ways to protect Nebraska's natural resources, IANR scientists provide innovative scientific leadership for Nebraska.

Rural Americans say they want training to keep up with, be part of Information Age

Rural Americans want to be active participants in the Information Age.

They already use a wide range of telecommunications technologies, and believe their access and use are important to their economic and social well-being.

These are among findings from the largest ever study of telecommunications technology's influence on rural quality of life and economic development. An IANR rural sociologist headed the six-state study for the Rural Policy Research Institute, a consortium of land-grant universities that explores rural implications of public policy issues.

Three-fourths of respondents viewed telecommunications as important or very important for educational and medical services. Nearly 65 percent rated telecommunications as important or very important to future economic growth. About 55 percent believed it is important for business retention and new business recruitment, while 54 percent said it was important for home-based businesses.

Findings show rural Americans want training and information on how to keep up with and exploit these technologies.

Those surveyed widely agreed that any community, regardless of size, should have access to the information highway. Respondents frequently expressed concern that rural areas might be bypassed or unplugged from the Information Age if access isn't provided or becomes too costly.

This information is being shared with decision-makers and others who deal with national and state telecommunications policy decisions.

State's cattle munching more byproduct feeds

Wet byproducts from Nebraska's ethanol and corn processing industry are showing up in more cattle feed bunks, thanks partly to IANR research.

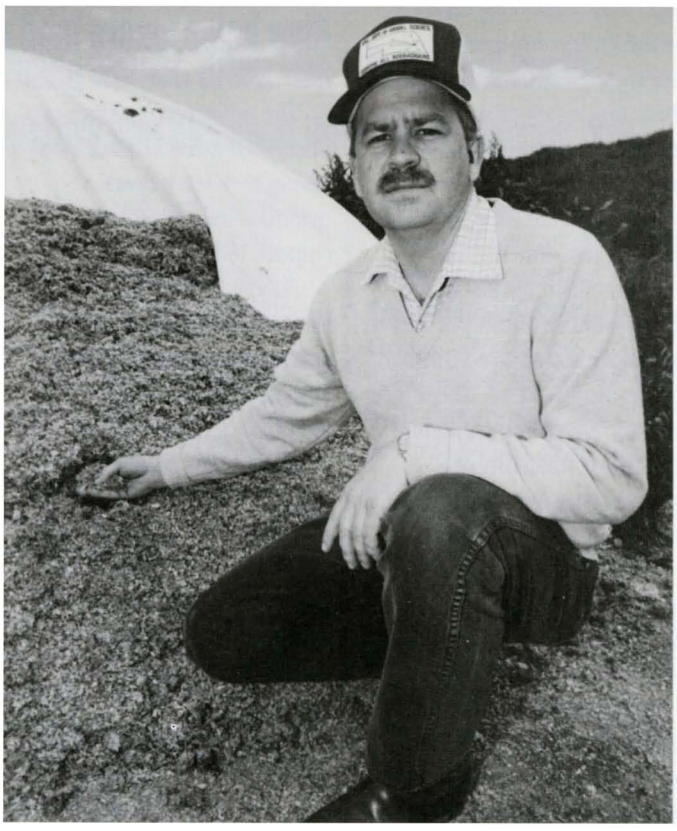
These feeds were largely unknown and unavailable to Nebraska feeders only a few years ago. Wet corn gluten from wet milling plants and wet distillers' grains and solubles from dry milling plants traditionally are dried before use, but they're being fed wet in Nebraska these days.

Five years of IANR animal science research revealed that feeding these byproducts wet saves drying costs and provides better nutrition than the dried product. The cattle industry is using research results, which provided important information about these feeds' potential and performance.

Research shows these feeds require more vigilant management, but either could reduce costs $5 to $12 per head compared with conventional corn-based rations.

The animal scientists say they think cattle feeders, corn growers, ethanol and corn processors and their communities all should benefit from expanded use of these Nebraska-produced byproducts.

Research on how best to use these new feeds continues.



Mark Hansen

Animal Scientist Rick Stock checks wet corn gluten feed, which comes from wet milling operations and resembles wet sawdust.

Modified irrigation system used for groundwater cleanup

A modified sprinkler irrigation system being tested near Hastings, Neb., could offer a safe, powerful and inexpensive groundwater cleanup tool.

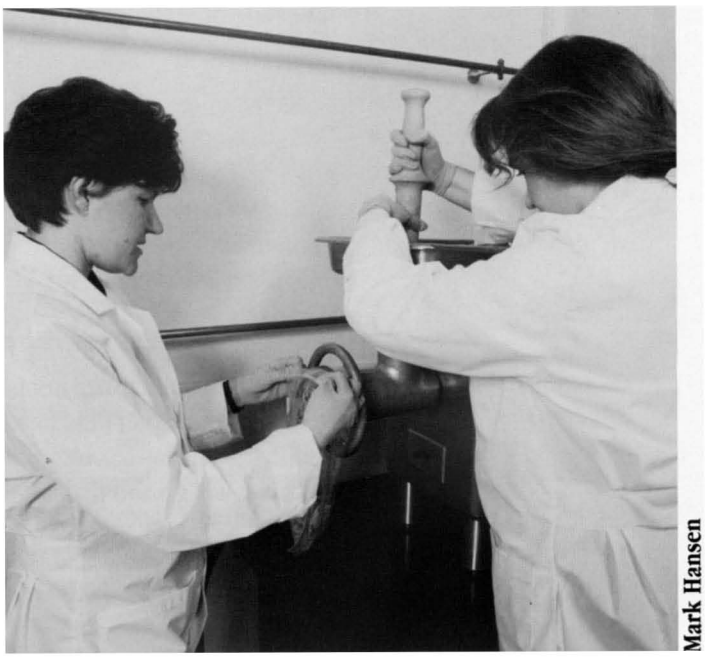
Preliminary NU research results show that pumping groundwater contaminated with volatile organic compounds through a modified irrigation system cleans it. This technique could simultaneously irrigate crops and save communities millions in cleanup costs.

An interdisciplinary team of NU researchers developed and is testing the technique. Tests are under way at two U.S. Environmental Protection Agency Superfund sites near Hastings where groundwater is contaminated with volatile organic compounds, which easily vaporize into the air when treated this way, and pose no risk.

Contaminated water at the sites is pumped through a well to a sprinkler and sprayed through nozzles against a pad. The impact turns the water into a thin film from which small droplets emerge, releasing contaminates into the atmosphere.

Initial results indicate this technique essentially restores water quality with minimal risk to people or the environment.

Average Superfund site cleanup cost is $27 million to $30 million. Researchers estimate that the NU-developed sprinkler technique would cost $500,000 or less.



Mark Hansen

Food Scientist Susan Sumner (left) and graduate student Reann Panchev do a test run grinding meat in a laboratory meat grinder. For their research, they use E. coli *0157:H7 modified with DNA that instills luminescence to track the troublemaker.*

Glow helps locate food poisoning culprit

The molecular makings of a firefly's glow are helping IANR researchers track down a nefarious food poisoning culprit's hideouts.

Food scientists give *E. coli* 0157:H7 a slight glow by genetically inserting Luciferin DNA as a tell-tale marker. The modified organism doesn't light up like fireflies in July, but its slight luminescence betrays its trail. With help from detection equipment, researchers track the troublemaker to learn how and where it might grow or spread during ground beef processing.

They run meat inoculated with modified *E. coli* 0157:H7 through a laboratory meat grinder and test samples from different locations on equipment. They're testing commercial sanitizers, and studying equipment cleaning techniques and timing to learn how best to quell the organism.

The marker technique makes detection faster and easier. It reveals *E. coli's* presence in two hours, instead of the two days required for traditional lab tests. More importantly, it detects significantly lower contamination levels and should help answer previously elusive questions about the microbe.

Modified *E. coli* 0157:H7 is a laboratory tool that helps researchers see how the bacteria behaves at realistic levels. Researchers aim to mimic actual processing conditions to provide solid scientific information for commercial processors.

Diversified cropping cuts farmers' costs

Diversified cropping eases time pressures, thereby reducing machinery and labor costs, IANR agricultural economists found.

Growing two or more crops a year means everything doesn't have to be done at once. Each crop is planted, tended and harvested at slightly different times.

IANR research shows that reducing timeliness pressure is a major, often unrecognized benefit of diversification.

Quantifying machinery and labor cost benefits of growing crops together is challenging but important to developing more realistic crop production cost estimates.

Agricultural economists developed a complex computer model to compare machinery and labor costs for growing one crop with costs for growing multiple crops. In this simulation, diversified farms grew a two- or three-crop mix of corn, soybeans, grain sorghum or oats. Researchers analyzed different crop combinations on 160- to 1,600-acre dryland farms.

Diversification reduces machinery and labor costs for both small and large farms, results show. Even a relatively small amount of diversification eases timeliness pressure.

Machinery and labor savings for growing two or three crops each year instead of a single crop ranged from about $54.75 per acre for 160 acres to $17.75 per acre on 1,600 acres.

Team is exploring food processing's effect on corn mold to help assure safe food supply

IANR food science research should provide information to help control potentially harmful molds in corn and assure food safety.

While most molds are harmless, some produce mycotoxins that can pose human health hazards. Food scientists are concentrating on fumonisins, a type of mycotoxin that several Fusarium mold species can produce.

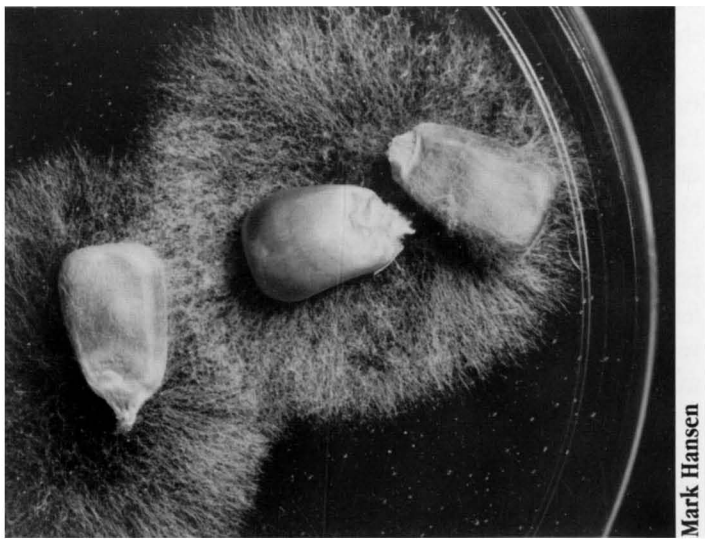
They're studying fumonisins' fate during food processing. Little is known about how processing affects mycotoxins. This research should provide information to help grain and food industries control mycotoxins and assure food safety, and to aid agencies assessing mycotoxins' food safety significance.

Scientists aren't sure how big a hazard fumonisins are. They're studying mycotoxins to increase understanding and to avert problems before they develop.

The team's recent work provides basic information about the extent of Fusarium and fumonisin contamination in corn, and shows Fusarium infection can vary yearly, depending on weather, cultural practices and other factors.

They found that boiling or heating corn inoculated with Fusarium doesn't eliminate fumonisins. Now, they're studying whether higher processing temperatures reduce or eliminate toxicity.

They're also examining how different processing techniques, such as baking, canning, frying and extrusion, affect fumonisins and their fate in processed foods.



Mark Hansen

Mold grows from corn kernels in a dish coated with nutrients specially selected to encourage growth of a specific mold species. Researchers can detect or grow a specific type of mold by using the right growing medium.

Mark Hansen

Kim Schalch (left), graduate research assistant, and Nutrition Scientist Nancy Lewis demonstrate the skin fold test that helps determine body fat levels. Lewis marks the proper spot before measuring with the skin fold calipers in her hand. Skin fold readings were part of the assessments for Lewis' research that found many young women with an early family history of heart disease don't realize they face an increased risk of developing the disease.

Young women often don't know that family history can increase their heart disease risk

Many young women with a family history of early heart disease don't realize they face increased risk, IANR nutrition research shows.

They eat about the same amount of dietary fat as their peers without a family history and have similar body fat levels, results show. The study explored the perceptions, behaviors and diets of 20- to 29-year-old women at risk of heart disease because a close relative developed the disease before 55. A family history of the disease and diets high in fat, especially saturated fat, are well-documented risk factors.

Sixty-five percent of the family history group perceived themselves at average or below average heart disease risk. Twenty-seven percent said they faced above average risk; 8 percent said they didn't think about it.

The College of Human Resources and Family Sciences scientist who headed this study says these results indicate young women need nutrition information and education because heart disease can begin early in life.

Veterinary scientist's work could have human significance

An IANR veterinary scientist has characterized a disease-causing bacterium that could have public health significance as a separate species.

He has proposed the name *Serpulina coli* for the bacterium.

The researcher compared bacterial strains and intestinal changes in people with AIDS, puppies, pigs and monkeys infected with a diarrheal disease called intestinal spirochetosis (IS). His conclusion: the same bacterium species caused the disease in all four groups.

That means people may be able to get the disease from animals and that could have public health significance.

While working on a spirochete, or spiral-shaped bacterium, that causes swine dysentery, the NU researcher decided to compare spirochete strains from pigs with those in other hosts, including humans.

Structural, biochemical and DNA analysis comparisons revealed that samples from young dogs, monkeys, humans and pigs matched.

Samples from humans carrying the spirochete were from people with AIDS. People can carry *S. coli* in their intestines and not become ill, but people with AIDS have weakened immune systems and are far more likely to develop chronic diarrhea and wasting caused by the spirochete.

Because the bacteria is identical in dogs and humans, it may pass from one to the other through fecal contact.

IS alone isn't fatal but it contributes to diarrhea which, in combination with other diseases, is dangerous for young children and immuno-compromised adults.

Mark Hansen

Veterinary Scientist Gerald Duhamel is studying a bacterium species he believes causes the diarrheal disease intestinal spirochetosis in people with AIDS, young dogs, pigs and monkeys. If the disease can pass between animals and people, it could have public health significance.

Light test-weight corn holds own in feeding trials

Contrary to popular belief, light test-weight corn is no lightweight in cattle feed performance, IANR research shows.

Feeding trials at NU's Panhandle Research and Extension Center showed no difference in energy value between light test-weight and normal test-weight corn on a pound-for-pound basis. Steers fed light test-weight corn in two years of growing and finishing trials performed as well as steers fed normal weight corn.

Cattle feeders and corn growers could benefit from this study's results.

Light test-weight corn typically sells at a discount. Feeders who pay less for light corn should be able to reduce their cost of gain a bit.

Corn producers facing a stiff discount if they sell their lightweight corn might instead feed it to livestock without sacrificing performance.

Microbes' power to convert carbon monoxide probed

An IANR biochemist is exploring ways to give some anaerobic, or oxygen-shunning, microorganisms a boost. If he succeeds, these enhanced microbes might become environmental cleanup or fuel production tools.

Carbon monoxide (CO), which poisons people and animals, fuels some anaerobes' life-sustaining processes and helps build their cellular structure. Along the way, they convert CO into acetic acid, the main acid in vinegar, and methane.

The scientist wants to capitalize on this appetite for CO and other toxic substances. He works to understand the fundamental biochemical reactions by which these anaerobes convert CO. If he unravels these intricacies, he or other scientists might enhance and harness the microbes.

This is basic and complex research, but he envisions using super-efficient anaerobes or fertilizing native anaerobes to spur growth to reduce local CO levels or produce fuel.

New test to help dry bean growers detect white mold

Nebraska dry bean producers suffer a perennial dilemma: whether to spray to prevent deadly white mold disease or take the chance that this will be a year the disease doesn't strike their fields.

IANR plant pathologists may have solved this dilemma. They've developed a way to detect in fields the spores that cause white mold. It could become a simple, accurate predictor of a farmer's risk from one of the state's most destructive dry bean diseases.

White mold is unpredictable and infection rates vary year-to-year. Fungicides control it but treatment is expensive, costing up to $25 per acre. Fungicides must be applied before growers know the disease will appear, so predicting the disease is an educated guess.

Researchers developed a culture medium to detect ascospores, the seeds of this fungal disease. When a spore lands on the blue gel-like medium and begins to grow, it appears as a yellow spot.

Bean growers could place dishes of the medium in their fields at blossoming. If spots appear, the grower would still have time to beat the disease by spraying. The technique could pay off for Nebraska's dry bean growers, who produced more than 1.8 million hundredweight of dry edible beans valued at nearly $43.7 million in 1993.

Mark Hansen

Turfgrass Physiologist Garald Horst checks turf atop undisturbed columns of soil carved from the surrounding area and encased in concrete. The 24-inch long soil columns provide a micro-profile of field conditions for studies on the fate of turf pesticides in soil.

Team tracking fate of pesticides in turfgrass

Pesticides help keep lawns green and healthy but they aren't healthy in the groundwater, where they can end up after leaching through the soil.

Results of an IANR study tracking the fate of pesticides applied to turfgrass offer homeowners and professional turf managers insights on ways to reduce the environmental threat to groundwater.

Farmers often take the heat for pesticide overuse, yet 2,400 tons of pesticides are applied annually to Nebraska lawns, golf courses, recreational areas and commercial landscapes.

An IANR horticulturist and an agronomist traced the movement and degradation rates of seven common pesticides under golf course management conditions. They applied pesticides to Kentucky bluegrass turf, then analyzed turf and soil samples to determine how much remained at various soil depths.

In the greenhouse researchers measured pesticide amounts in water that leached through soil encased in concrete columns.

Results were a pleasant surprise: overall amounts of pesticide leaching through the soil were smaller and degradation was faster than researchers would have predicted.

Researchers recommend homeowners and turf managers can reduce the pesticides moving into soil by careful selection and application and by monitoring when and how much they irrigate.

Ethics said key to family violence

Anger and emotion get a lot of attention when family violence erupts.

An IANR family scientist thinks focusing on ethical dimensions of family violence could be more revealing. He's exploring relational ethics, or basic fundamental values people hold about relationships.

He developed a theoretical framework, which he uses to study the relational ethics of perpetrators of intimate partner violence. The framework focuses on: fairness, reciprocity and equity; respect for others' worth and rights; caring, concern and commitment.

Using this framework and standardized assessment tools, he interviews NU Family Resource Center clients in violent relationships and focuses on perpetrators. Analysis is revealing how different perpetrators view relational ethics.

He'll use his ethics framework and interview findings to develop a tool to classify different types of abusers. Police, therapists and others working with family violence eventually could use such information.

Ultimately, he hopes his relational ethics research yields new prevention, intervention and prediction procedures for intimate partner violence.

Quick, accurate technique identifies sorghum seedlings with potential to handle the heat

If it can't stand the heat, a sorghum variety should get out of the field. Sorghum breeders soon should be able to identify which plants can and can't stand the heat before they ever get into the field.

An IANR plant pathologist has developed a quick, accurate method to identify sorghum seedlings with high heat tolerance potential. This ultimately could speed development of improved varieties.

Heat stress causes normal plant functions, such as grain filling, to shut down. Yields decrease, costing growers. That's why sorghum breeders seek heat-tolerant plants to help breed new varieties.

The new technique speeds and simplifies selection. Scientists can screen week-old plants for heat tolerance in the lab instead of relying on traditional season-long field studies.

This method pinpoints the temperature that triggers a plant's heat-stress reaction. The higher the reaction temperature, the more heat tolerant the plant.

Researchers take plant samples at different temperatures and times of day and extract specialized molecules called messenger RNAs. These molecules carry genetic information cells need to create heat-stress proteins.

Further tests reveal the amount of heat-stress proteins produced. A good measure of a plant's stress threshold is the temperature at which protein production begins.

Borrowed genes may give plants disease resistance

Milk, bacteria and tobacco don't seem to have much in common, but all play a part in an IANR researcher's quest for broad-spectrum disease resistance in crop plants.

Broad-spectrum resistance could reduce growers' guesswork about which treatments are needed to protect crops each season and decrease the need for chemical pesticides.

Using a biotechnology technique called genetic transformation, an NU plant pathologist inserted genes from human milk and bacteria into tobacco plants. The new genes made the tobacco plants resistant to specific bacterial and viral diseases.

Wheat streak mosaic virus, a serious wheat disease, and bacterial diseases of dry beans are the pathologist's research targets. Tobacco plants are used as models for testing the foreign genes because tobacco cells are easily transformed and grown into whole plants.

The next big step is getting the genes into the target crop plants and testing them against different diseases.

Universal test may sort good nematodes from harmful ones

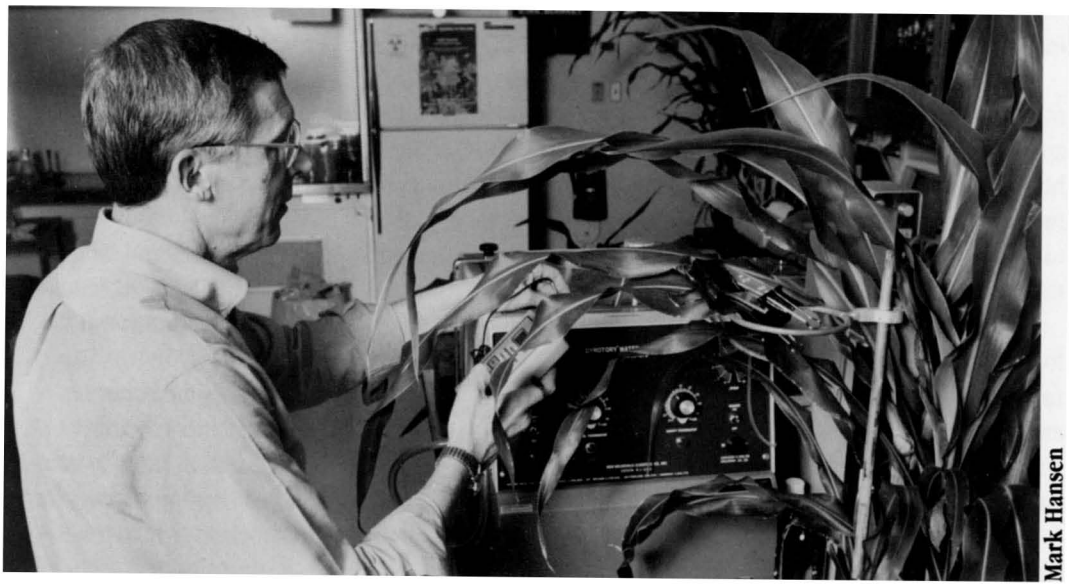
When it comes to nematodes, or tiny worms, telling the good guys from the bad can be tough.

That's a dilemma for regulatory personnel who inspect agricultural commodity shipments and must halt a shipment if they suspect it harbors harmful nematodes.

Regulators now must err on the conservative side if they suspect a troublemaker, but quarantines can mean economic losses for producers.

An IANR nematologist is trying to help. He's using DNA fingerprinting and other genetic techniques to develop a universal test that detects all quarantinable nematodes.

He aims to provide a simple, accurate tool regulatory personnel could use to determine whether shipments of citrus, potatoes, corn or other ag commodities are infested with one of several harmful nematodes.



Mark Hansen

Plant Pathologist Jim Partridge checks the temperature of water used to heat a portion of a sorghum plant's leaf surface. Partridge developed a way to quickly and accurately identify sorghum seedlings' heat tolerance potential.

Equipment switch might cut ethanol production costs

An NU researcher thinks he has found a less expensive way to gelatinize starch, a key step in ethanol processing.

The IANR chemical engineer's research shows dry milling plants could cut ethanol production costs by using different equipment for gelatinization, which turns starch into a slurry as a precursor to fermentation.

Processors now use jet cookers, which gelatinize starch at 68 to 70 percent moisture. Energy researchers designed a modified extruder that gelatinizes starch at 40 to 45 percent moisture.

The reduced moisture content means less energy is expended heating water along with the starch. That translates into a savings, research showed.

Initial estimates indicate a 50 million-gallon per year dry milling ethanol plant could save $300,000 to $500,000 annually in operating costs using an extruder instead of a jet cooker.

While an extruder's purchase price is significantly higher than a jet cooker's, researchers estimate a roughly 12 to 18 percent total return on investment with an extruder.

Finding ways to reduce ethanol production costs ultimately should benefit Nebraska's economy and its corn producers.

Mark Hansen

Entomologist Lance Meinke demonstrates a natural corn rootworm beetle feeding stimulant he uses as part of a more environmentally friendly control system. Beetles feed on the yellow block (right) that contains the stimulant but seem less interested in the white untreated block.

Corn rootworm beetles chomp on fatal feast

Researchers are setting the scientific table for a corn pest dining disaster both farmers and the environment should appreciate.

An IANR entomologist is exploring the most effective ways to combine small amounts of insecticide with naturally-occurring compounds, called semiochemicals, in baits that stimulate a corn rootworm beetle feeding frenzy. It's an irresistible but deadly combination for the beetles, which cost Nebraska farmers millions annually in yield losses and treatment costs.

This approach requires up to 90 percent less insecticide than conventional sprays because it triggers rootworm beetles to eat the insecticide. Soil insecticides and broadcast sprays rely on contact to kill beetles, so they must be more powerful and used in greater volume.

The bait system also spares beneficial insects because the feeding stimulant attracts only corn rootworm beetles and their close relatives. It actually repels some desirable species, such as lady beetles.

The team is now evaluating a commercial sprayable formulation containing insecticide and the semiochemical. The company tapped IANR's basic research on semiochemicals in developing the product.

Researchers also are studying corn rootworm beetle movements and behavior in hopes of optimizing the semiochemical's effectiveness under field conditions.

Husker Red takes national spotlight

Go Husker Red!

Another Husker is claiming national honors. It's Husker Red penstemon, an IANR-developed perennial flower cultivar.

Husker Red, developed by a horticulturist at NU's West Central Research and Extension Center, has been named Perennial Plant of the Year for 1996 by the Perennial Plant Association.

The designation is made well before the 1996 growing season so nurseries can grow enough plants to meet the consumer demand the honor generates.

Husker Red sports attractive dark red foliage in spring and fall and bears dainty white flowers on 24- to 36-inch stems in summer. Blooms make excellent cut flowers and seed pods are useful for dried arrangements. This versatility is one reason Husker Red beat 50 rivals in competition for perennial plant of the year.

NU officially released Husker Red in 1984. It became generally available at nurseries by 1987 and has since steadily grown in popularity.

A few more glimpses at ARD research

- Dairy producers looking to reduce forage fiber replacement costs can find an economical alternative close to home. IANR animal science research shows that a soybean/soyhull/sodium bicarbonate combination is an effective, economical alternative to whole cottonseed, the most commonly used forage fiber replacement. Switching from cottonseed to soybean/soyhull/sodium bicarbonate combination should reduce feed costs at least 10 percent per cow per day. This is part of research exploring how best to use abundant byproducts as economical dairy feeds.

- New plants for Nebraska could grow from a scientific exchange program between IANR and Hungarian horticulturists. They're swapping ideas, plants, information and visits. Finding new, stress-tolerant trees and shrubs for Nebraska landscapes and making them available through the nursery industry is the ultimate goal. Scientists first must test the newcomers' adaptability to Nebraska conditions.

- Cody, a newly released NU seeded turf-type buffalograss, became available to Nebraskans for the first time in 1995. IANR turf scientists have released several improved turf-type buffalograsses in recent years, but Cody is the first available from seed. Planting seed typically costs less than sod or plugs. Like NU's other improved buffalograsses, Cody is denser, lower-growing and darker green than conventional buffalograsses. It needs less water, fertilizer and mowing than conventional cool-season turfgrasses. Seed from another recent NU buffalograss release, Tatanka, should be available in 1996.

- A USDA Agricultural Research Service plant pathologist at UNL has developed a genetic technique to positively identify different strains of wheat streak mosaic virus. By analyzing and comparing viral genetic samples from different diseased wheat plants, he now can determine which strains are causing infection. This is helping scientists answer questions about how the virus spreads and could improve their ability to predict epidemics of this serious wheat disease.

- Three new proso millet varieties developed by IANR and USDA agronomists offer larger seeds and higher yields than earlier NU releases of the crop. Most of this Panhandle crop is sold for bird seed. Seed size is important because large seeds are eye-catchers for consumers who buy bird seed.

- Weather seems to play a role in calf birth weights. NU West Central Research and Extension Center animal scientists' research indicates warmer winters lead to lighter birth weight calves while colder winters produce heavier calves. Heavier birth weights cause more calving difficulty. Researchers found 58 percent of 2-year-old heifers had calving difficulty following the severe winter of 1993 when calf birth weights averaged 82 pounds. By comparison 35 percent of heifers had calving difficulty last winter, when temperatures averaged 5 degrees above normal and birth weights averaged 71 pounds.

- Accurate, uniform seed spacing is a major factor in sugar beet yields. IANR biological systems engineers have devised a computerized sensor system to diagnose planter accuracy woes in laboratories or service centers. Their system assesses a planter's seed spacing performance faster and more accurately than existing systems and provides more information. The system will aid research but also could be used by sugar beet companies, implement dealers, repair shops and seed companies. It also might help speed new planter design and testing.

- Eastern redcedars are akin to weeds when they invade grasslands. They reduce rangeland productivity and increase livestock handling costs. IANR range science research shows fire is an effective, low-cost way to control redcedar on grasslands. Combining burning with intensive follow-up treatments such as cutting or herbicides, cuts costs of those treatments by 50 percent. Results should help landowners decide which treatment suits their needs.

- IANR animal scientists have developed a temperature humidity index to help turkey growers identify conditions that trigger profit-robbing heat stress in their birds. The index combines temperature and humidity into a single number that pinpoints where bird heat stress begins. The index can be used for everything from constructing economic models to designing turkey houses to making production predictions. That's good news for Nebraska's turkey industry, which has doubled production in the past six years.

- IANR nutrition scientists' research shows healthy Nebraska men who chew or smoke tobacco have lower blood levels of major antioxidant nutrients than those who don't. Antioxidants are believed to help protect against disease. The study shows smokers and chewers need to consume more antioxidant nutrients just to maintain levels similar to nonusers, so an antioxidant nutrient supplement may be helpful.

Faculty Awards and Recognition

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 awards for their work in the past year.

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

ARD faculty members honored for their work during fiscal year 1994-1995 include:

Agronomy

David J. Andrews received the Doreen Margaret Mashler Distinguished Scientific Achievement Award, 1994. This award was given for collaborative breeding of higher yielding, disease resistant pearl millet cultivars in several countries by the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), India.

Alice J. Jones received the Certificate of Merit from the United States Department of Agriculture-CSRS.

David A. Mortensen received the Distinguished Young Scientist Award from the North Central Weed Science Society.

James F. Power received the Agronomic Service Award from the American Society of Agronomy

David R. Shelton received the Achievement Award from the Nebraska Wheat Growers Association.

James S. Schepers received the Werner L. Nelson Award for Diagnosis of Yield-Limiting Factors from the American Society of Agronomy.

James S. Schepers received the Fellow Award from the Soil Science Society of America.

Roy F. Spalding received the Progress Award for Leadership of the Management State Evaluation Area (MSEA) project near Shelton, Neb. as one of five national projects designated for water quality research, and for demonstrating best management practices for both water and nitrogen fertilizer in production of irrigated crops from the Nebraska Water Conference Council in cooperation with the Institute of Agriculture and Natural Resources.

James E. Specht received the Agronomic Achievement Award-Crops from the American Society of Agronomy.

Animal Science

Dennis R. Brink received the Livestock Service Award from the Walnut Grove Products Company.

Robert A. Britton received the Service Award from the Nebraska Grain Sorghum Producers Association.

Richard J. Grant received the Junior Faculty Recognition for Excellence in Research Award from the Agricultural Research Division.

Terry J. Klopfenstein was inducted into membership in the Nebraska Hall of Agricultural Achievement.

Thomas W. Sullivan received the Fellow Award from the Poultry Science Association.

Biometry

Linda J. Young received the Fellow Award from the American Statistical Association.

Entomology

Blair D. Siegfried received the Outstanding Young Scientist Award from Sigma Xi, University of Nebraska Chapter.

David W. Stanley-Samuelson received the Outstanding Scientist Award from Sigma Xi, University of Nebraska Chapter.

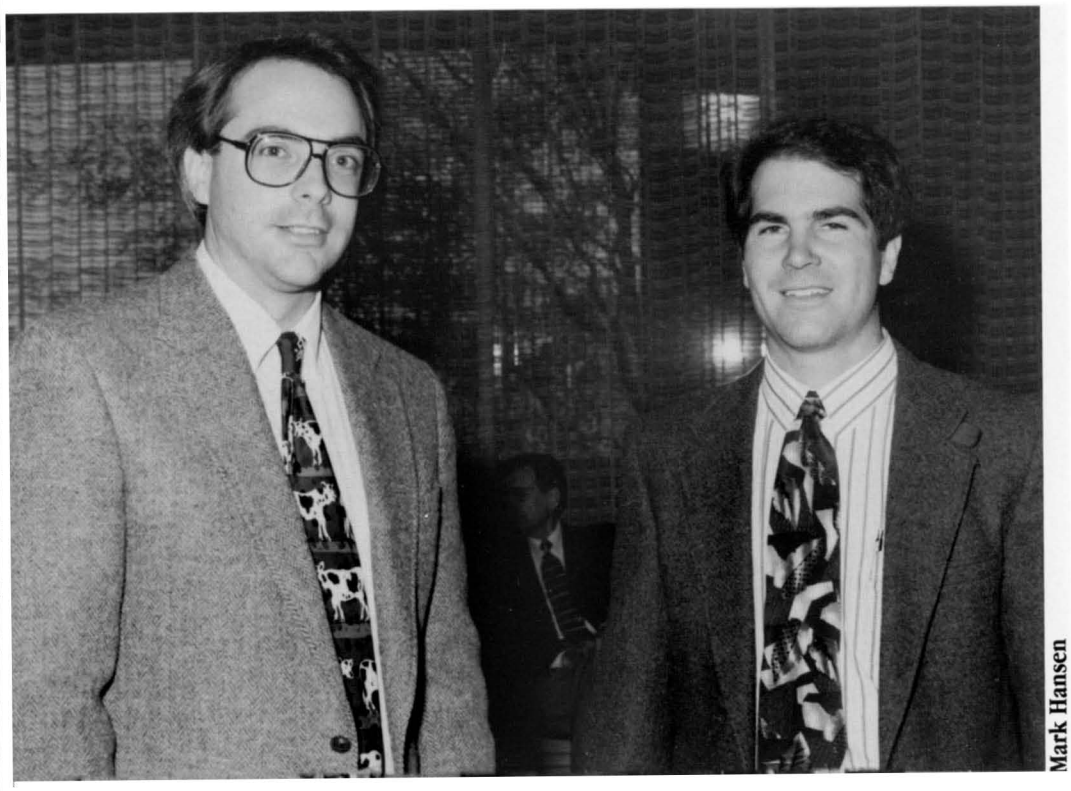
Horticulture

Dermot P. Coyne received the Medallion for Outstanding Research and Creative Activity from the University of Nebraska.

Ellen T. Paparozzi received the YWCA Tribute to Women – Science and Technology Category from the YWCA.

Terrance P. Riordan received the Fellow Award from the American Society of Agronomy.

Robert C. Shearman received the Education and Research Person of the Year Award from the Nebraska Fertilizer and Ag-Chemical Institute.



Mark Hansen

Richard J. Grant (left), dairy nutritionist in animal science, and Drew J. Lyon, dryland crops agronomist at the Panhandle Research and Extension Center in Scottsbluff, both received Junior Faculty Recognition for Excellence in Research Awards from the Agricultural Research Division.

Plant Pathology

Thomas O. Powers was named a Fulbright Scholar, Lecture/Research at St. Patricks College, Maynooth, Ireland.

Anne K. Vidaver received the Award of Merit for Distinguished Service to Agriculture from Gamma Sigma Delta, University of Nebraska-Lincoln Chapter.

Veterinary and Biomedical Sciences

Marjorie F. Lou received the Senju Cataract Research Award from the Senju Cataract Company of Japan.

Debora Hamernik received the Watkins Life Science Young Investigator Award from the Department of Biological Sciences, Wichita State University.

Family and Consumer Sciences

Douglas A. Abbott received the Margaret Killian Distinguished Professorship from the College of Human Resources and Family Sciences.

Craig W. Smith received the Psi Chi Award from the National Psychological Honor Society.

Pauline D. Zeece received the IANR Team Effort Award from the Institute of Agriculture and Natural Resources.

Nutritional Science and Dietetics

Judy Driskell received the Outstanding Paper Award from The American Oil Chemists' Society.

Textiles, Clothing and Design

Joan Laughlin received the Honor Award from the United States Department of Agriculture.

Rita C. Kean received the Distinguished Scholarly Activity Award from the College of Human Resources and Family Sciences.

Northeast Research and Extension Center

David P. Shelton received the Outstanding Reviewer for the Soil and Water Division of ASAE Award from the Soil and Water Division of the American Society of Agricultural Engineers.

Michael C. Brumm received the Pork Booster Award from the Cedar County Pork Producers.

Panhandle Research and Extension Center

Drew J. Lyon received the Junior Faculty Recognition for Excellence in Research Award from the Agricultural Research Division.

West Central Research and Extension Center

Paul T. Nordquist received a Special Award in Recognition of Contributions in Agriculture from the Nebraska Crop Improvement Association.

Gene H. Deutscher received an IANR Team Effort Award from the Institute of Agriculture and Natural Resources.

Graduate Student Awards and Recognition

One of the primary missions of the ARD research program is to develop the scientists of tomorrow. We are committed to providing exceptional graduate students with the opportunity to work with and learn from our research faculty. ARD is among the national leaders in research in food production and processing, natural resources management, and family sciences. Approximately 550 graduate students are pursuing advanced degrees with ARD faculty. The quality of our graduate students is reflected in the recognition they receive.

Agricultural Meteorology

Andrew E. Suyker received a Widaman Distinguished Graduate Assistant Award from the Agricultural Research Division.

Elena A. Tsvetsinskaya was a special visiting student in the Global Climate Dynamics Program at the National Center for Atmospheric Research, Boulder, Colo.

Agronomy

Zhengming Li received a Widaman Distinguished Graduate Assistant Award from the Agricultural Research Division.

John Ortmann received the Arthur William Sampson Fellowship Award from the Agricultural Research Division (University of Nebraska Foundation).

Animal Science

Kristin L. Barkhouse received a Widaman Distinguished Graduate Assistant Award from the Agricultural Research Division.

Ellen G. Bergfeld received a Widaman Distinguished Graduate Assistant Award from the Agricultural Research Division.

Brian P. Demos received:

- a Widaman Distinguished Graduate Assistant Award from the Agricultural Research Division;
- a Vincent H. Arthaud Travel Award from the Animal Science Department.

Scott J. Eilert received:

- the Procter and Gamble Company Fellowship from the Institute of Food Technologists;
- a Vincent H. Arthaud Travel Award from the Animal Science Department;
- was named the Ph.D. Graduate Student Poster Competition Session Winner by the American Meat Science Association.

David T. Hickok received the Tony J. Cunha Award for Research Proposal from the Salt Institute.

Steve M. Lonergan received the Milton E. Mohr Biotechnology Fellowship from the Center for Biotechnology.

Wesley N. Osburn received:

- the Victor W. Henningsen, Sr. Graduate Fellowship from Henningsen Foods (administered by the Food Science and Technology Department);
- a Widaman Distinguished Graduate Assistant Award from the Agricultural Research Division;
- the John Hallman Memorial Award from the Animal Science Department.

Drew H. Shain received a Vincent H. Arthaud Travel Award from the Animal Science Department.

Biological Systems Engineering

Xiaoli Bi received a Widaman Distinguished Graduate Assistant Award from the Agricultural Research Division.

Howard Clyma received a Widaman Distinguished Graduate Assistant Award from the Agricultural Research Division.

David B. Parker received a Widaman Distinguished Graduate Assistant Award from the Agricultural Research Division.

Aristippos Gennadios was named a Graduate Student of the Year by the American Society for Agricultural Engineering (ASAE) Mid-Central Conference.

Entomology

Felix Aikhionbare received the Richard H. Larson Minority Fellowship from UNL Graduate Studies.

Odair Fernandes received a Scholarship Grant from the Florida Entomological Society.

Paula Gouveia-Marcon received:

- the Burkey Memorial Fund Fellowship from UNL Graduate Studies;
- the Graduate Student Award for M.S. Research Presentation from the North Central Branch Entomology Society of America.

Jennifer Gray received the Richard H. Larson Minority Fellowship from the UNL Graduate Studies.

Midori Ono received a Widaman Distinguished Graduate Assistant Award from the Agricultural Research Division.

Robert K.D. Peterson received:

- the Hardin Distinguished Graduate Fellowship from the Agricultural Research Division;
- the J.H. Comstock Graduate Student Award from the North Central Branch Entomological Society of America;
- the Maude Hammond Fling Fellowship from UNL Graduate Studies.

Ramnath Subramanian received:

- the Mabel J. Reichenbach Fellowship from UNL Graduate Studies;
- the Grants-in-Aid Research Award from Sigma Xi.

Food Science and Technology

Yusuf Ali was named a Graduate Student of the Year by the American Society for Agricultural Engineering (ASAE) Mid-Central Conference.

Roberto Buffo received the General Mills Fellowship from General Mills.

Doug Christensen received:

- the Tyson Foods Outstanding Graduate Student award from Tyson Foods;
- the Institute of Food Technologists Graduate Fellowship from Florasynth, Inc.;
- a Widaman Distinguished Graduate Assistant Award from the Agricultural Research Division;
- the Mabel J. Reichenbach Fellowship from the Center for Biotechnology.

Gerald Zirnstein received the Institute of Food Technologist Graduate Fellowship from the Kraft General Foods Foundation.

Horticulture

Loren J. Giesler received a Widaman Distinguished Graduate Assistant Award from the Agricultural Research Division.

Veterinary and Biomedical Sciences

Eduardo Flores received the Susan Mills Graduate Student Award from the Veterinary and Biomedical Sciences Department.

Wei Lu received:

- the MVP Laboratories - Research Most Beneficial to the Animal Health Industry Award from the UNMC Student Research Forum;
- the SmithKline Beecham Animal Health Research Award from the UNMC Student Research Forum;
- the Best Graduate Student Presentation at the 15th Annual Western Food Animal Disease Research Conference from the Veterinary and Biomedical Sciences Department.

Luis Schang received the Best Graduate Student Seminar Award from the Veterinary and Biomedical Sciences Department.

Nutritional Science and Dietetics

Jeffrey Hampl received a Widaman Distinguished Graduate Assistant Award from the Agricultural Research Division.

Sharon Davis received the National Pork Fellowship Award from the National Pork Industry Foundation of the National Pork Producers Council.

Monica Hargens received a Distinguished Graduate Assistant Award from the College of Human Resources and Family Sciences.

Kristine Richert received a Distinguished Graduate Assistant Award from the College of Human Resources and Family Sciences.

Donna Handley received an Award for Outstanding Scholarly Activity by a Masters Recipient from the College of Human Resources and Family Sciences.

Textiles, Clothing and Design

Karen Baumert received the Student Research Award from the American Association of Textile Chemists and Colorists.

Mary Jane Furgason received an Award for Outstanding Scholarly Activity by a Masters Recipient from the College of Human Resources and Family Sciences.

Variety and Germplasm Releases

ARD faculty involved in plant breeding and genetics research make important contributions to the improvement and development of agricultural and horticultural crops. Public breeding programs such as ARD's are essential to the continued enhancement of plant germplasm. These programs provide the resources and flexibility to pursue long-term breeding programs in crops that may not have a current commercial interest. They also can address genetic, cultural, and management interactions characteristics of today's agriculture, as well as the future.

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 1994.

Agronomy

Crop: Corn (*Zea mays* L.)

Germplasm Release: N209

Scientists: W.A. Compton, D. Galusha, W.C. Youngquist, and S.M. Kaeppler

Characteristics: N209 was developed by self-pollination directly from NSS1(6), the sixth cycle of per se selection in the Nebraska Stiff Stalk synthetic. It is a medium short, S5 line with a prolific tendency. It is strong and vigorous, maintaining plant health late in the season. Ears are medium to large with deep, but soft kernels light yellow in color. The tassel is relatively small but does shed ample amounts of pollen. N209 requires approximately 1460 heat units for flowering and is a genotype requiring 110-120 days to relative maturity. Hybrids of N209 would be best adapted to southeast and south central Nebraska, and east toward the central Corn Belt.

Crop: Corn (*Zea mays* L.)

Germplasm Release: N211

Scientists: W.A. Compton, D. Galusha, W.C. Youngquist, and S.M. Kaeppler

Characteristics: N211 was derived by self-pollinating a CLN tolerant S2 line selected from NCLNA, a non-Stiff Stalk synthetic. This S2 line was one of the 10 component lines of NCLNAC1 in which both disease tolerance and topcross yield performance were evaluated. N211 is a medium tall, S5 line and has excellent staygreen characteristics, maintaining plant health late in the season. N211 was specifically selected for combining ability and tolerance to corn lethal necrosis (CLN). N211 has a large tassel with 3-5 branches that sheds ample pollen, and has produced acceptable yield in combination with B73/N28 type lines. It requires approximately 120 days to relative maturity. This hybrid would be best adapted to southeast and south central Nebraska, and north central Kansas.

Crop: Corn (*Zea mays* L.)

Germplasm Release: N215

Scientists: W.A. Compton, D. Galusha, W.C. Youngquist, and S.M. Kaeppler

Characteristics: N209 was developed by self-pollination directly from NB(S)RF1(5), the fifth cycle of per se selection in the Nebraska B synthetic. It is a medium short, S6 line with some prolific tendency. The plant is average in height and has medium-sized ears. The tassel of N215 is relatively large and sheds pollen well. It requires approximately 1460 heat units for flowering and is a genotype requiring 115-120 days to relative maturity. N215 has excellent yield in hybrid combination with Stiff-Stalk lines. The yield advantage is particularly evident under dryland conditions, and the hybrids show good tolerance to stalk and root lodging. Hybrids of N215 would be best adapted to southeast and south central Nebraska, and east toward the central Corn Belt.

Crop: Corn (*Zea mays* L.)

Germplasm Release: NSS(8), NBS(8), NS(B)(8), NB(S)(8)

Scientists: W.A. Compton and S.M. Kaeppler

Characteristics: NS(B)(8) and NB(S)(8) are the products of eight cycles of full-sib reciprocal recurrent selection for yield and lodging resistance in the Nebraska Stiff Stalk (NSS) and Nebraska B (NBS) synthetics, respectively. The last release of this material was the 1987 release of cycle 6. These populations have improved substantially for per se and testcross yield, as well as lodging resistance since cycle 0. Preliminary testcross data indicate that cycles 7 and 8 of these populations will be an excellent source of high-yielding, and lodging and drought tolerant inbred lines. Lines selected from these populations would be best adapted to southeast and south central Nebraska, and east toward the central Corn Belt.

Crop: Proso Millet (*Panicum miliaceum* L.)

Variety Name: Earlybird

Scientist: D. D. Baltensperger

Characteristics: Earlybird is an increase of a white proso F3 derived F4 line from the cross Minco /NE76010 / Rise/NE79017. Earlybird has a white seed coat (lemma and palea) and a compactum (closed) type panicle. The foliage is green in color and is similar to Sunup. Cool growing conditions increase the incidence of red pigmentation in the foliage. Relative yield is expected to be better than other cultivars when growing season is limited by cropping system, climate or other reasons. It is intermediate in maturity. Seed size of Earlybird is larger than all previously released cultivars (684 seeds per 5g). Straw strength is similar to Sunup and better than other cultivars with similar plant height. Earlybird has shown no susceptibility to Russian wheat aphid. No observations have been made of relative resistance to other insects or disease.

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

Germplasm Release: N148A and N148B

Scientists: D.J. Andrews, J.F. Rajewski, P.T. Nordquist, A.J. Heng, R.G. Goll, and J.D. Harris

Characteristics: Seed parent N148A and its maintainer N148B are medium, early dwarf, pale yellow grained sorghums. The seed parent line is in A1 cms (milo cytoplasm). These lines provide new genetic variability for hybrid production. N148A and B are 95-105 cm tall (5-10 cm taller than N122A) and flower 1-3 days earlier than N122A. Plant reaction color is purple, heads are awned and well exerted. Seed is hard, pale yellow with a translucent pericarp and a non-pigmented testa. Seed size ranges from 21 to 30 g/1000, depending on location. N148A and B have not been evaluated for reaction to pests and diseases.

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

Germplasm Release: NP26

Scientists: J. F. Pedersen, R.R. Duncan, and B.E. Johnson

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

Characteristics: NP26 sorghum population is selected from the broadly based random mating population NP20BR. NP20BR is a composite of several populations with different grain quality attributes including high protein content, high lysine, and yellow endosperm, and was subjected to one cycle of selection for metabolizable energy prior to release. NP20BR contains a small frequency of the antherless gene (al), but the primary gene for recombination was ms3. The antherless trait has not been observed in NP26, but a small frequency of al could still be present. Frequency of the ms3 gene is approximately 2:1 in NP26. NP26 should have value as a source of high grain quality in an anthracnose resistant background.

Crop: Soybean [*Glycine max* (L.) Merr.]

Variety Name: Saturn

Scientists: G. L. Graef and J. E. Specht

Characteristics: This cultivar is released for use in specialty markets because of its superior seed size and its desirability for the vegetable soybean market (edamame). Saturn is derived from an F4 plant selected from the cross Hobbit X Jogun, and was evaluated for yield, seed size, and seed composition in Nebraska from 1990 through 1993. It is a late Maturity Group III cultivar with white flowers, gray pubescence, tan pods, and a determinate stem growth habit. Seeds are dull yellow with yellow hila, and an average seed size of 280 mg seed-1. Saturn has not been evaluated for specific disease resistances, but is not known to possess any specific genes for resistance.

Crop: Soybean [*Glycine max* (L.) Merr.]

Variety Name: Mercury

Scientists: G. L. Graef and J. E. Specht

Characteristics: This cultivar is released for use in specialty markets because of its small seed size and its desirability for the natto and sprouts markets. Mercury is derived from an F4 plant selected from the cross T208 X Hobbit, and was evaluated for yield, seed size, and seed composition in Nebraska from 1990 through 1993. It is a late Maturity Group II cultivar with purple flowers, gray pubescence, tan pods, and a determinate stem growth habit. Seeds are dull yellow with light buff hila, and an average seed size of 75 mg seed-1. Mercury has not been evaluated for specific disease resistances, but is not known to possess any specific genes for resistance.

Crop: Soybean [*Glycine max* (L.) Merr.]

Germplasm Release: Mapping Population NE-SMP-1

Scientist: J. E. Specht

Characteristics: This population was developed for the purpose of integrating classical genetic markers (i.e., pigmentation, development, morphology, isozymes, etc.) and molecular genetic markers (i.e., RFLPs, RAPDs, SSRs, etc.) into a common genetic linkage map. The NE-SMP-1 population was created by researchers from the mating of two near-isogenic lines (NILs) of the soybean cultivars Clark and Harosoy in 1990-91. Generation advance during the next five years will be conducted to eventually generate 59 F2.10 seed progenies, at which point a single F10 seed can be selected from each of the 59 progenies to create 60 recombinate inbred lines. The mapping of additional molecular markers in this population is continuing, which should make this population useful to many researchers who wish to integrate classical linkage group markers into molecular maps.

Crop: Hard Red Winter Wheat [*Triticum aestivum* (L.) em Thell]

Variety Name: Alliance

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

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

Characteristics: Alliance is an increase of a hard red winter wheat F3-derived line from the cross Arkan/Colt/Chisholm sib which was made in 1982. It is a white chaff, awned, semi-dwarf wheat with medium maturity. In Nebraska, it is 1.5 days later than TAM107 and 1.5 days earlier than Arapahoe and Redland. It is similar in plant height to Arapahoe and Redland, taller than Vista, and has moderate straw strength. Alliance has a heterogeneous reaction to the Great Plains biotype of Hessian fly. Alliance is susceptible to leaf rust and soil-borne mosaic virus. Its reaction to wheat streak mosaic virus needs further testing, however, it appears to be less susceptible than many Nebraska-released cultivars. Alliance is a genetically lower test weight wheat, superior to Redland and similar to Arapahoe. The recommended growing area for Alliance is the dryland wheat production areas of the Nebraska Panhandle. It has a short coleoptile so care should be taken for planting it too deep in dry years.

Horticulture

Crop: Buffalograss [*Buchloë dactyloides* (Nutt.) Engelm.]

Variety Name: '315'

Scientists: T.P. Riordan, F.P. Baxendale, R.E. Gaussoin, G.L. Horst, and R.C. Shearman

Characteristics: Cultivar '315' establishes at a slower rate than more aggressive buffalograsses that are more adapted to the southern United States. This slower establishment rate is not considered a significant problem, since planting recommendations can take this into consideration. Cultivar '315' is a warm-season turfgrass, and it will green up later in the spring and go dormant earlier in the fall than cool-season grasses. Although this characteristic may be negative in the North, '315' will have a longer growing season than other warm-season grasses in the South. Although dependent upon temperature, '315' greens up and goes dormant earlier than other commercially available buffalograsses. It is believed that this earlier dormancy imparts increased winter hardiness. In tests in the North and South '315' had a darker green color than other buffalograsses early in the growing season, and a comparable color during the rest of the season. In the 1992 National Buffalograss Trial, '315' had an outstanding turfgrass quality average. Cultivar '315' produces a fine, dense, low growing, attractive turf.

Crop: Buffalograss [*Buchloë dactyloides* (Nutt.) Engelm.]

Variety Name: '378'

Scientists: T.P. Riordan, F.P. Baxendale, R.E. Gaussoin, G.L. Horst, J.E. Watkins, and R.C. Shearman

Characteristics: Cultivar '378' buffalograss has a moderate rate of establishment and is slower than the more aggressive buffalograsses, which are more adapted to the southern United States. This moderate rate of establishment is not considered a significant problem, since adjustments can be made in planting recommendations. New sod harvesting technologies also have made it possible to harvest weaker sod through the use of netting while rolling the sod. Cultivar '378' has an excellent dark green color during most of the growing season. In the 1992 National Buffalograss Trial, '378' had the darkest green genetic color of all entries. '378' has an earlier spring greenup than other buffalograsses, but it does go dormant in early fall as a possible dormancy mechanism. Cultivar '378' has excellent overall turf quality, ranking second in the National Trial in tests over the entire United States. '378' also has a low growth habit, is uniform, and has excellent density. '378' has shown tolerance to insects and diseases, resulting in a cultivar which requires little water, fertilizer, mowing, or pesticides.

Panhandle Research and Extension Center

Crop: Proso Millet (*Panicum miliaceum* L.)

Variety Name: Huntsman

Scientists: D. D. Baltensperger, L. A. Nelson, G.B. Frickel, and R. A. Anderson

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

Characteristics: Huntsman is an increase of a white proso millet derived F3 derived F4 line from the cross NE79012/NE79017/3/Cope/Dawn/Common. Huntsman has a white seed coat (lemma and palea) and a compactum (closed) type panicle. The foliage is green in color and is similar to Sunup. Relative yield is expected to be better than other cultivars when growing season is not limited by cropping system, climate or other reasons. Huntsman is intermediate in maturity between Cope and Sunup, and is later in maturity than all previous Nebraska releases. Seed size (711 seeds per 5g) is larger than all previously released cultivars except Dawn. Straw strength is similar to Sunup and better than other cultivars with similar plant height, and is less susceptible to lodging than Panhandle, Cope, Abarr, or Snowbird. Huntsman has shown no susceptibility to Russian wheat aphid. No observations have been made of relative resistance to other insects or disease.

West Central Research and Extension Center

Crop: Prairie Petite Lilac [*Syringa vulgaris* L.]

Variety Name: Prairie Petite

Scientists: D. T. Lindgren and G. Viehmeyer[1]

Characteristics: The light pink/lavender colored florets (0.9 cm wide) and inflorescence (5 cm x 5 cm) are sparse. The parent plant at the University of Nebraska West Central Research and Extension Center is 94 cm tall by 114 cm wide at 23-years old. Several 6-year old plants at the West Central Research and Extension Center average 38 cm in height and 70 cm in width. Leaf blades on the original parent plant average 4.9 cm wide by 6.9 cm long while leaves on the 6-year old plants averaged 4.5 cm wide by 6.2 cm long.

Crop: Prairie Pink (*Dianthus plumarius* L.)

Variety Name: Prairie Pink

Scientists: D. T. Lindgren and R.D. Uhlinger[1]

Characteristics: The average height of Prairie Pink is 39.3 cm, average stalks per plant 11.8, average flower diameter 4.6 cm, average petals per bloom 29.1 and average buds per plant 30.2 at the West Central Research and Extension Center. The plant blooms for two to four weeks beginning in early June and reflowers in late summer. Plants normally live an average of three to four years. Prairie Pink is vegetatively propagated from stem cuttings. Plants from seed do not breed true. Prairie Pink is being recommended for release because of its winter survival tendency, compact growth, attractive pink double flowers and repeat blooming.

[1]Deceased

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

Germplasm Release: N134 through N147 A/B germplasms

Scientists: P. T. Nordquist, B. Skates, C. Pierson, D. J. Andrews, G. Frickel, T. Hoegemeyer, K. Kofoid, B. Schatz, and J. F. Rajewski

Characteristics: These A/B germplasms were developed and selected from the North Platte sorghum breeding program. All were derived from random mating populations of B X R germplasms. The fertile lines are non-restorers (B lines) to milo male sterile (A1) cytoplasm. None of the fertile lines have been test mated to any other cytoplasmic sterile cytoplasms. Days from planting to anthesis range from about 7 days earlier to about 3 days later than the mean of TX3042, KS57 and CK60.

Patent

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 or specialized processes. These patents often are licensed by private industry, with royalties being reinvested in future ARD research. The following patent was awarded in 1994.

Plant Pathology

Title: *Olpidium* zoospores as vectors of recombinant DNA to plants

Patent No: 5,416,010

Scientists: W. G. Langenberg and L. Zhang

Description: The primitive fungus *Olpidium brassicae* is an obligate plant parasite that acts as a natural virus vector transmitting tobacco necrosis virus and certain other viruses to roots of many monocotyledonous and dicotyledonous plants. Plasmid pAM981, carrying the chloramphenicol acetyltransferase (CAT) gene, was packaged by dissociated capsid protein of tobacco necrosis virus. The resulting nucleoprotein complexes were acquired by *O. brassicae* zoospores and transmitted to wheat roots. Transient expression of CAT in wheat roots was detected, indicating that transformation can be achieved if plants can be regenerated from root tissue.

Administration

ARD is one of five divisions within the Institute of Agriculture and Natural Resources (IANR) at the University of Nebraska. IANR was established by the Nebraska legislature in 1973 and has its headquarters on the University of Nebraska–Lincoln East Campus.

The University of Nebraska system has four campuses: University of Nebraska–Lincoln, University of Nebraska Medical Center, University of Nebraska at Omaha and the University of Nebraska at Kearney. The University of Nebraska system is governed by an elected Board of Regents and administered by a system and campus administration.

Administrative Personnel (June 1995)

University of Nebraska Board of Regents

Robert M. Allen, Hastings
Don S. Blank, McCook
Chuck Hassebrook, Walthill
Drew Miller, Papillion
Nancy O'Brien, Waterloo
Margaret Robinson, Norfolk
Rosemary Skrupa, Omaha
Charles S. Wilson, Lincoln

Student Regents

UNMC – Kory Barr
UNO – Shawntell Hurtgen
UNL – David Bargen
UNK – Jennifer Prince

Administrative Officers

L. Dennis Smith, President, University of Nebraska

Graham S. Spanier, Chancellor, University of Nebraska–Lincoln

Irvin T. Omtvedt, Vice Chancellor, Institute of Agriculture and Natural Resources, and Vice President, University of Nebraska

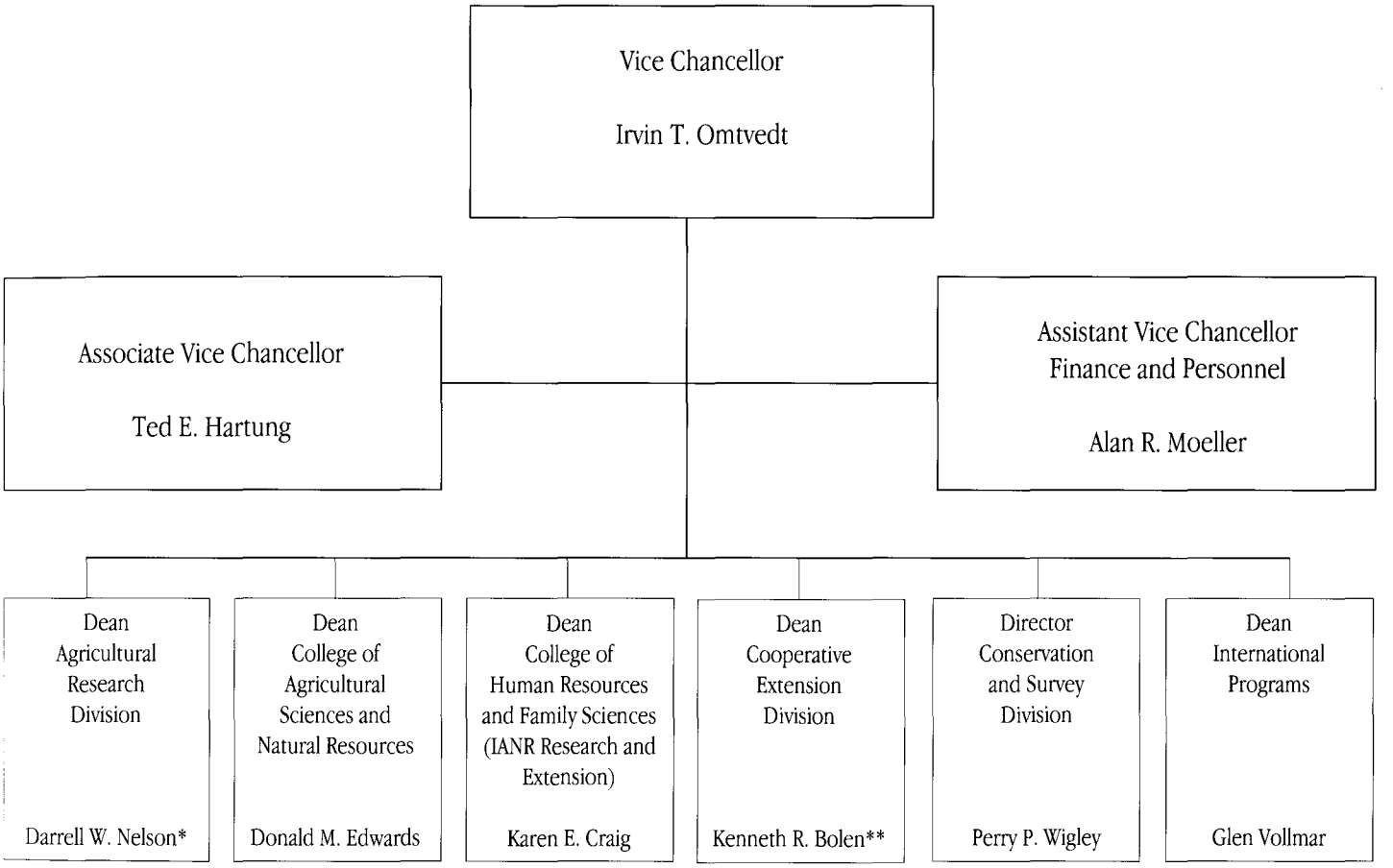
Agricultural Research Division

Darrell W. Nelson, Dean and Director
Dale H. Vanderholm, Associate Dean and Director
Karen E. Craig, Assistant Director/Home Economics
Steven S. Waller, Assistant Dean and Director
David W. Stanley-Samuelson[1], Administrative Intern
Dora Dill, Staff Assistant
Diane Mohrhoff, Clerical Assistant III
Nelvie Lienemann, Staff Secretary III
Mary Jacobs[1], Temporary/On Call

[1]Temporary appointment

Organizational Chart

Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln



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

Administrative Units Reporting to Deans and Directors

Institute of Agriculture and Natural Resources
The University of Nebraska–Lincoln
June 1995

Agricultural/Natural Resources Departments

Agricultural Economics
Sam Cordes[1], Head
Roy Frederick[1], Interim Head
Gary Lynne[2], Head

Agricultural Leadership, Education and Communication
Allen Blezek, Head

Agricultural Meteorology
Blaine Blad, Head

Agronomy
Steve Baenziger, Head

Animal Science
Elton D. Aberle, Head

Biochemistry
Marion O'Leary, Head

Biological Systems Engineering
Glenn Hoffman, Head

Biometry
David Marx, Head

Entomology
Z B Mayo, Head

Food Science and Technology
Steve Taylor, Head

Forestry, Fisheries and Wildlife
Gary Hergenrader, Head

Horticulture
Paul Read, Head

Plant Pathology
Anne Vidaver, Head

Veterinary and Biomedical Sciences
Jack Schmitz, Head

College of Human Resources and Family Sciences

Family and Consumer Sciences
Shirley Baugher, Chair

Nutritional Science and Dietetics
Marilynn Schnepf, Chair

Textiles, Clothing and Design
Rita Kean, Chair

Off-Campus Research Centers

Agricultural Research and Development Center
Ithaca–Daniel Duncan, Director

Northeast Research and Extension Center
Concord–Robert Fritschen, Director

Panhandle Research and Extension Center
Scottsbluff–Charles Hibberd, Director

South Central Research and Extension Center
Clay Center–Charles Stonecipher, Director

Southeast Research and Extension Center
Lincoln–Loyd Young[1], Director
DeLynn Hay[1], Interim Director
Randy Cantrell[2], Director

West Central Research and Extension Center
North Platte–Pete Jacoby, Director

Interdisciplinary Centers

Biotechnology Center
Don Weeks, Director

Food Processing Center
Steve Taylor, Director

Center for Grassland Studies
Martin Massengale, Director

Great Plains Regional Center for Global Environmental Change
William Easterling, Director

Industrial Agricultural Products Center
Milford Hanna, Director

International Trade Policy Center
Robert McGeorge, Director

Center for Rural Community Revitalization and Development
Sam Cordes, Director

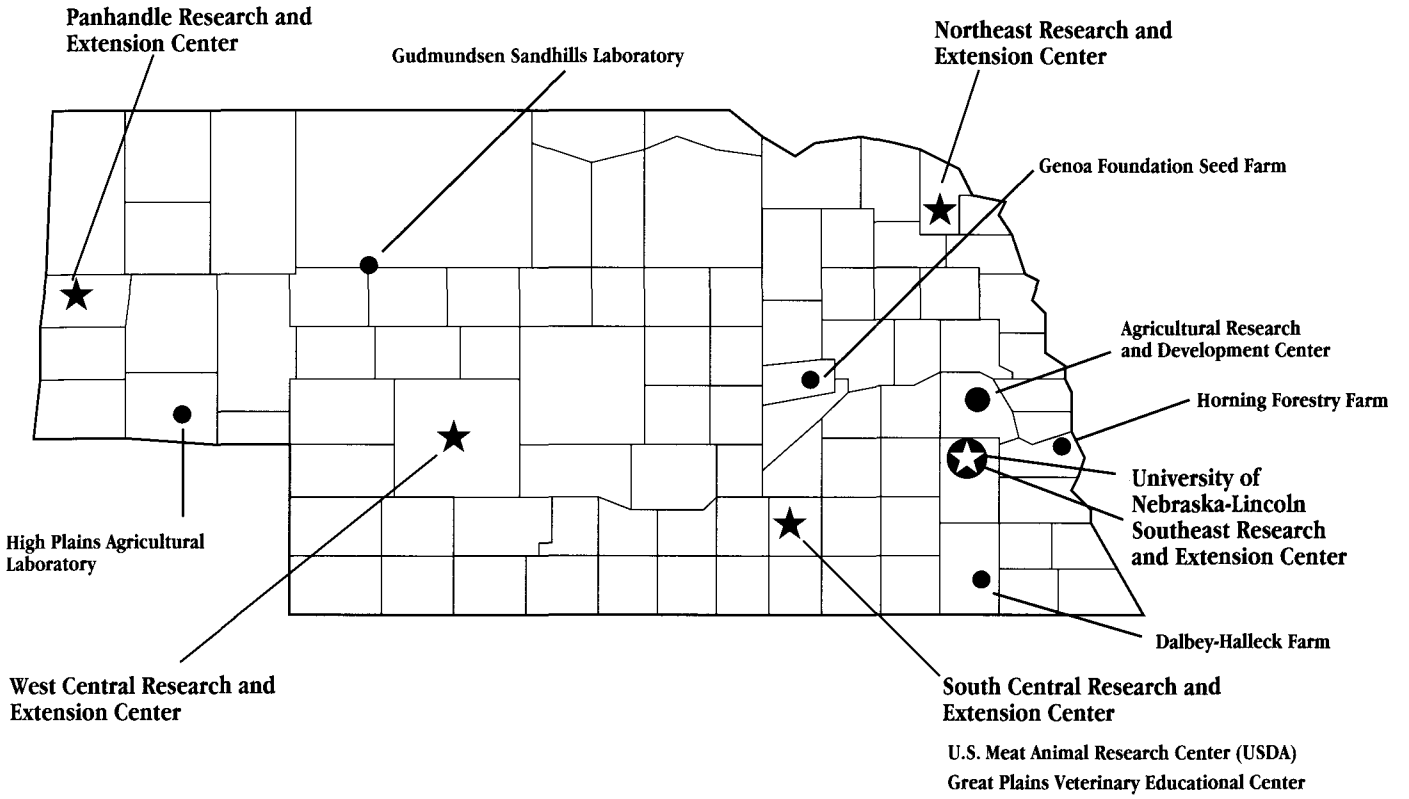
Center for Sustainable Agricultural Systems
Chuck Francis, Director

Water Center/Environmental Programs
Bob Volk, Director

IANR Communications and Information Technology
Ted Hartung, Director

[1] Ended appointment during 1994-1995
[2] Began appointment during 1994-1995

IANR Research Facilities



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

Agricultural Research and Development Center — Ithaca

Dalbey-Halleck Farm — Virginia

Genoa Foundation Seed Farm — Genoa

Gudmundsen Sandhills Laboratory — Whitman

High Plains Agricultural Laboratory — Sidney

Horning Forestry Farm — Plattsmouth

Northeast Research and Extension Center — Concord

Panhandle Research and Extension Center — Scottsbluff

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

Southeast Research and Extension Center — Lincoln

West Central Research and Extension Center — North Platte

Faculty

Approximately 260 faculty members have research appointments in ARD. Most have joint appointments, and carry teaching and 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, also are noted here (as other).

The percentages listed represent the proportion of a faculty member's time assigned to each. The primary research responsibility is identified for each. The rank listed is for July 1994–June 1995.

Four departments contain U.S. Department of Agriculture Agricultural Research Service scientists. USDA Forest Service employees are affiliated with the Departments of Forestry, Fisheries and Wildlife, and Entomology. They are designated USDA in this listing.

All ARD off-campus personnel who are located at Centers are associated with an on-campus department, as well.

Agricultural/Natural Resources Departments

	Rank	Rsch	Ext	Tch	Other	Area of Responsibility
Agricultural Economics						
Gary Lynne	Professor	0.40	0.30	0.30		Head
A.L. Frederick[1,2]	Professor	0.29	0.50	0.21		Interim Head
Sam M. Cordes	Professor	0.40	0.60			Director, Center for Rural Community Revitalization and Development
John C. Allen	Assistant Professor	0.35	0.65			Rural Sociology
J. David Aiken	Professor	0.50	0.30	0.20		Agricultural and Natural Resources Law
Dale G. Anderson	Professor	0.60		0.40		Marketing and International Development
Azzeddine Azzam	Associate Professor	0.70		0.30		Marketing and Quantitative Methods
Maurice E. Baker	Professor	0.20		0.80		Resource Economics
Dennis Conley	Associate Professor	0.35		0.65		Agribusiness
Glenn A. Helmers	Professor	0.60		0.40		Production Economics
Bruce B. Johnson	Professor	0.45		0.55		Resource and Community Economics
H. Douglas Jose	Professor	0.20	0.80			Farm and Ranch Management
Raymond E. Massey	Assistant Professor	0.25	0.75			Farm Management
Robert McGeorge[1]	Assistant Professor	0.25			0.75	International Trade Law
William Miller[2]	Professor	0.25	0.50	0.25		Natural Resources and Environmental Economics
Richard Perrin	Professor	0.75		0.25		Production Economics, Policy Analysis
Wesley F. Peterson	Associate Professor	0.75		0.25		International Trade
George H. Pfeiffer	Associate Professor	0.25		0.75		Farm and Ranch Management
Jeffrey S. Royer	Associate Professor	0.70		0.30		Agribusiness and Marketing
Raymond J. Supalla	Professor	0.75		0.25		Resource Economics

	Rank	Rsch	Ext	Tch	Other	Area of Responsibility
Agricultural Leadership, Education and Communication						
Allen G. Blezek	Professor	0.15	0.12	0.48	0.25	Head, Leadership
F. William Brown	Associate Professor	0.25	0.25	0.50		Leadership Development
O.S. Gilbertson	Professor	0.25	0.15	0.60		Teacher Education/Leadership Development
Terry Meisenbach	Assistant Professor			0.25	0.75	Journalism
Agricultural Meteorology						
Blaine Blad	Professor	0.80	0.10	0.10		Head
William Easterling	Associate Professor	0.60			0.40	Agricultural Climatology
Kenneth Hubbard	Professor	0.67	0.23	0.10		Agricultural Climatology
Joon Kim	Assistant Professor	1.00				Agricultural Meteorology
Steve Meyer	Assistant Professor	0.50	0.50			Agricultural Climatology
David Stooksbury	Assistant Professor	0.40			0.60	Agricultural Climatology
Shashi Verma	Professor	0.85		0.15		Agricultural Meteorology
Elizabeth Walter-Shea	Assistant Professor	0.85		0.15		Agricultural Meteorology
Albert Weiss	Professor	0.50	0.35	0.15		Agricultural Meteorology
Donald Wilhite	Professor	0.85		0.15		Agricultural Climatology

[1] Ended research appointment during 1994-1995
[2] Began research appointment during 1994-1995

Agronomy

	Rank	Rsch	Ext	Tch	Other	Area of Responsibility
P. Stephen Baenziger	Professor	0.40	0.30	0.30		Head, Small Grains Breeding and Genetics
Bruce E. Anderson	Associate Professor	0.40	0.60			Forage Management
David J. Andrews	Professor	1.00				Millet and Sorghum Breeding
Timothy J. Arkebauer	Assistant Professor	0.85		0.15		Crop Environment Physiology
Max Clegg	Associate Professor	0.85		0.15		Crop Physiology
Steven D. Comfort	Assistant Professor	0.75	0.25			Soil Environmental Chemist
Betsy Dierberger[1]	Assistant Instructor	0.23		0.77		Soil Science
John W. Doran	Professor				USDA	Soil Biochemistry
Rhae A. Drijber	Assistant Professor	0.60		0.40		Soil Microbiology Ecology
Jerry D. Eastin	Professor	0.85		0.15		Crop Physiology
James R. Ellis	Associate Professor				USDA	Soil Microbiology
Charles A. Francis	Professor	0.37	0.38		0.25	Cropping Systems/Center for Sustainable Agricultural Systems
Kenneth D. Frank	Associate Professor	0.25	0.25		0.50	Soil Fertility/Soil Testing
George L. Graef	Assistant Professor	0.85		0.15		Soybean Breeding
Robert Graybosch	Associate Professor				USDA	Wheat Genetics
Blaine Johnson	Associate Professor	0.80		0.20		Quantitative Genetics
Alice J. Jones	Associate Professor	0.50	0.50			Soil Conservation
Heidi F. Kaeppler	Assistant Professor				USDA	Sorghum Genetics
Shawn M. Kaeppler	Assistant Professor	0.80		0.20		Plant Molecular Cytogenetics
Donald J. Lee	Assistant Professor	0.40		0.60		Plant Genetics
David T. Lewis	Professor	0.40		0.60		Soil Genesis and Classification
Jerry Maranville	Professor	0.85		0.15		Sorghum Physiology
Alexander Martin	Professor	0.33	0.67			Weed Science
Stephen C. Mason	Associate Professor	0.50		0.50		Cropping Systems
Martin A. Massengale	Professor	0.37	0.19	0.19	0.25	Forages/Center for Grassland Studies
Robert A. Masters	Assistant Professor				USDA	Range Weed Control
Dennis McCallister	Associate Professor	0.40		0.60		Soil Chemistry
David A. Mortensen	Associate Professor	0.75		0.25		Weed Science
Lowell E. Moser	Professor	0.35		0.65		Forage Physiology
Lenis A. Nelson	Professor	0.50	0.50			Crop Variety Evaluation/New Crops
Scott J. Nissen[1]	Assistant Professor	0.75	0.25			Weed Physiology
Jeffrey Pedersen	Associate Professor				USDA	Sorghum Genetics and Breeding
C. James Peterson	Associate Professor				USDA	Wheat Genetics
Todd Peterson	Assistant Professor	0.40	0.60			Cropping Systems
James F. Power	Professor				USDA	Soil Fertility
William L. Powers	Professor	0.88		0.12		Soil Physics
Donald H. Sander	Professor	0.50	0.50			Organic Waste Management
Walter H. Schacht	Assistant Professor	0.60		0.40		Range Science
James S. Schepers	Professor				USDA	Soil Chemistry
Patrick J. Shea	Professor	0.80		0.20		Environmental Chemistry of Xenobiotics
David R. Shelton	Assistant Professor	0.80	0.20			Cereal Chemist
Joseph H. Skopp	Associate Professor	0.50		0.50		Soil Physics
Roy F. Spalding	Professor	0.50		0.10	0.40	Hydrochemist
James E. Specht	Professor	0.80		0.20		Soybean Physiology and Breeding
Paul E. Staswick	Associate Professor	0.85		0.15		Plant Molecular Biologist
James Stubbendieck	Professor	0.50		0.50		Range Ecology and Management
Dale Swartzendruber	Professor	0.90		0.10		Soil Physics
Mary Thomas-Compton[1]	Assistant Professor	1.00				Popcorn Breeding
Gary E. Varvel	Associate Professor				USDA	Soil Management
Kenneth P. Vogel	Professor				USDA	Grass Breeding
Daniel T. Walters	Associate Professor	0.60		0.40		Soil Management
Wallace W. Wilhelm	Associate Professor				USDA	Crop Physiology

Animal Science

	Rank	Rsch	Ext	Tch	Other	Area of Responsibility
Elton D. Aberle	Professor	0.35	0.34	0.31		Head
Sara M. Azzam	Assistant Professor				Industry	Systems Analysis
Mary M. Beck	Associate Professor	0.70		0.30		Poultry Physiology
Gary L. Bennett	Associate Professor				USDA	Systems
Michael D. Bishop	Assistant Professor				Industry	Breeding
Dennis R. Brink	Professor	0.30		0.70		Ruminant Nutrition
Chris R. Calkins	Professor	0.70		0.30		Meats
Ronald K. Christenson	Professor				USDA	Physiology
Edgar T. Clemens	Professor	0.50		0.50		Gastroenteric Physiology
L. Davis Clements	Professor	0.18	0.07		0.75	Meat and Poultry Byproducts
Larry V. Cundiff	Professor				USDA	Breeding
Calvin L. Ferrell	Associate Professor				USDA	Nutrition
J. Joe Ford	Professor				USDA	Physiology
Richard J. Grant	Assistant Professor	0.70	0.30			Dairy Nutrition
Keith E. Gregory	Professor				USDA	Breeding
H. Edward Grotjan, Jr.	Professor	0.60		0.40		Physiology
Thomas G. Jenkins	Associate Professor				USDA	Breeding
Rodger K. Johnson	Professor	0.60		0.40		Swine Breeding
Steven J. Jones	Associate Professor	0.50		0.50		Meats
Jeffrey F. Keown	Professor	0.30	0.70			Dairy Management
James E. Kinder	Professor	0.45		0.30	0.25	Beef Physiology
Roger J. Kittok	Associate Professor	0.85		0.15		Reproductive Physiology
Terry J. Klopfenstein	Professor	0.70		0.30		Ruminant Nutrition
Richard K. Koelsch	Assistant Professor	0.09	0.21		0.70	Livestock Waste Management
Mohammad Koohmaraie	Associate Professor				USDA	Meats
Larry L. Larson	Associate Professor	0.50		0.50		Dairy Physiology
Dan B. Laster	Professor				USDA	Reproductive Physiology
Donald G. Levis	Professor	0.25	0.75			Swine Physiology
Austin J. Lewis	Professor	0.70		0.30		Swine Nutrition
Kreg A. Leymaster	Associate Professor				USDA	Breeding
Donald D. Lunstra	Professor				USDA	Physiology
Roger W. Mandigo	Professor	0.60		0.40		Meats
Phillip S. Miller	Assistant Professor	0.60		0.40		Swine Nutrition
Mark Morrison	Assistant Professor	0.38		0.12	0.50	Rumen Microbiology
Merlyn K. Nielsen	Professor	0.60		0.40		Breeding and Genetics
J. Calvin Parrott, III	Professor				Industry	Ruminant Nutrition
Jerome C. Pekas	Associate Professor				USDA	Nutrition
Rick J. Rasby	Associate Professor	0.25	0.75			Beef Management
Andrew J. Roberts	Assistant Professor				USDA	Physiology
Gary A. Rohrer	Assistant Professor				USDA	Breeding
Sheila E. Scheideler	Associate Professor	0.25	0.75			Poultry Management
Rick A. Stock	Associate Professor	0.50	0.50			Feedlot Nutrition
L. Dale Van Vleck	Professor	0.05		0.15	USDA	Breeding and Genetics
Vincent H. Varel	Associate Professor				USDA	Bacterial Physiology
Thomas H. Wise	Assistant Professor				USDA	Physiology
Jong-Tseng Yen	Professor				USDA	Nutrition
Lawrence D. Young	Associate Professor				USDA	Breeding
Dwane R. Zimmerman	Professor	0.50		0.50		Swine Physiology

[1] Ended research appointment during 1994-1995
[2] Began research appointment during 1994-1995

Biochemistry

	Rank	Rsch	Ext	Tch	Other	Area of Responsibility
Marion H. O'Leary	Professor	0.50		0.25	0.25	Head
Ruma V. Banerjee	Assistant Professor	0.85		0.15		Mechanistic Enzymology
Raymond Chollet	Professor	0.90		0.10		Photosynthesis
Richard Dam[1]	Associate Professor	0.84		0.16		Nutritional Biochemistry
Sylvia C. Darr	Assistant Professor	0.90		0.10		Molecular Biology
John H. Golbeck	Professor	0.90		0.10		Biophysics/Chemistry of Photosystems
Robert V. Klucas	Professor	0.90		0.10		Nitrogen Fixation
Herman W. Knoche	Professor	0.40		0.40		Lipid Biochemistry
John P. Markwell	Professor	0.80		0.10		Plant Biochemistry
Stephen W. Ragsdale	Associate Professor	0.85		0.15		Enzymes
Robert J. Spreitzer	Professor	0.85		0.15		Plant Molecular Genetics
Fred W. Wagner	Professor	0.50				Enzymes
Donald P. Weeks	Professor	0.15			0.85	Plant Molecular Biology

Biological Systems Engineering

Glenn J. Hoffman	Professor	0.35	0.50	0.15		Head
Leonard L. Bashford	Professor	0.55		0.35	0.10	Tractors and Design Engineering
L. Davis Clements	Professor	0.37	0.13		0.50	Meat and Poultry Byproducts
Dean E. Eisenhauer	Professor	0.75		0.25		Surface Irrigation and Chemigation
Thomas G. Franti	Assistant Professor	0.25	0.75			Surface Water Management
John E. Gilley	Associate Professor				USDA	Soil Erosion
Robert D. Grisso	Associate Professor	0.25	0.75			Agricultural Machinery
G. LeRoy Hahn	Professor				USDA	Livestock Housing and Stress Management
Milford A. Hanna	Professor	0.45		0.10	0.45	Food and Bioprocess Engineering
Terry A. Howell	Professor				USDA	Irrigation Scheduling
David D. Jones	Assistant Professor	0.35		0.65		Product Handling and Storage
Michael F. Kocher	Associate Professor	0.40		0.60		Controls Engineering
Louis I. Leviticus[1]	Professor	0.40			0.50	Power and Machinery Engineering
Derrel L. Martin	Associate Professor	0.65		0.35		Sprinkler Irrigation
Michael M. Meagher	Assistant Professor			0.20	0.80	Bioprocess Engineering
George E. Meyer	Associate Professor	0.60		0.40		Plant Growth Modeling
Jack A. Nienaber	Professor				USDA	Animal Calorimetry
Dennis D. Schulte	Professor	0.50		0.50		Pollution Control and Energy Systems
LaVerne Stetson	Professor				USDA	Agricultural Electricity
Kenneth Von Bargen	Professor	0.55		0.45		Equipment Systems Management
Darrell Watts	Professor	0.60	0.40			Water Quality/Irrigation
Curtis L. Weller	Assistant Professor	0.60		0.20	0.20	Food and Bioprocess Engineering
Wayne Woldt	Assistant Professor	0.25	0.50		0.25	Bioenvironmental Engineering

	Rank	Rsch	Ext	Tch	Other	Area of Responsibility
Biometry						
David B. Marx	Professor	0.50		0.50		Head
Kent Eskridge	Associate Professor	0.60		0.40		Statistical Consultant
Carol Gotway	Assistant Professor	0.65		0.35		Statistical Consultant
Stephen D. Kachman	Assistant Professor	0.75		0.25		Statistical Consultant
Anne Parkhurst	Professor	0.50		0.50		Statistical Consultant
Walter W. Stroup	Professor	0.50		0.50		Statistical Consultant
Linda J. Young	Professor	0.75		0.25		Statistical Consultant
Entomology						
Z B Mayo	Professor	0.67	0.07	0.17		Head/Aphid Genetics
Frederick P. Baxendale	Associate Professor	0.25	0.75			Turf Insects
Stephen D. Danielson	Associate Professor	0.25	0.75			Forage Insects
Mary Ellen Dix	Associate Professor				USDA	Shelterbelt Insects
John E. Foster	Professor	0.40	0.50	0.10		Insect Genetics
Leon G. Higley	Associate Professor	0.80		0.20		Insect Ecology
Wayne L. Kramer	Assistant Professor				SA*	Medical Entomology
Lance J. Meinke	Associate Professor	0.80		0.20		Soil Insects
James J. Petersen	Professor				USDA	Livestock Entomology
Richard D. Peterson	Assistant Professor				USDA	Livestock Entomology
Kenneth P. Pruess	Professor	0.63	0.17	0.20		Aquatic Insects
Blair D. Siegfried	Associate Professor	0.80		0.20		Insect Toxicologist
Steven R. Skoda	Assistant Professor				USDA	Livestock Entomology
David W. Stanley-Samuelson	Associate Professor	0.78	0.22			Insect Physiologist
David B. Taylor	Associate Professor				USDA	Livestock Entomology
Gustave D. Thomas	Professor				USDA	Livestock Entomology
Food Science and Technology						
Steve L. Taylor	Professor	0.40	0.34	0.26		Head, Food Toxicology
Lloyd B. Bullerman	Professor	0.60	0.10	0.30		Food Microbiology/Mycology
Susan B. Cuppett	Associate Professor	0.60		0.40		Food Lipids
Glenn W. Froning	Professor	0.75		0.25		Poultry Products
Milford A. Hanna	Professor	0.20			0.80	Food and Bioprocess Engineering
Susan Hefle[2]	Assistant Professor	1.00				Food Allergy Research
Robert W. Hutkins	Associate Professor	0.65		0.35		Food Biotechnology
David S. Jackson	Associate Professor	0.70	0.30			Cereals/Oilseeds Processing
Michael M. Meagher	Associate Professor	0.80		0.20		Food Engineering
John H. Rupnow[1]	Professor	0.40		0.60		Food Biochemistry/Microbiology
Khem H. Shahani[1]	Professor	0.45	0.33	0.05		Food Chemistry
Durward A. Smith	Associate Professor	0.22	0.33		0.45	Horticultural Food Crops Processing
Susan S. Sumner	Assistant Professor	0.30	0.70			Food Microbiology
Curtis L. Weller	Associate Professor			0.20	0.80	Food and Bioprocess Engineering
Randy L. Wehling	Associate Professor	0.50		0.50		Food Analysis
Michael G. Zeece	Associate Professor	0.75		0.25		Food Protein Chemistry

[1] Ended research appointment during 1994-1995
[2] Began research appointment during 1994-1995

*State Agency

	Rank	Rsch	Ext	Tch	Other	Area of Responsibility
Forestry, Fisheries and Wildlife						
Gary L. Hergenrader	Professor	0.17	0.16	0.17	0.50	Head
James R. Brandle	Associate Professor	0.70		0.30		Forestry/Windbreaks
Ronald M. Case	Professor	0.25		0.75		Wildlife
Bert M. Cregg	Assistant Professor				USDA	Forestry
Stephen G. Ernst	Associate Professor	0.75		0.25		Forest Genetics
Mark O. Harrell	Associate Professor	0.25			0.75	Forest Insects
Kyle D. Hoagland	Associate Professor	0.75		0.25		Limnology
Dennis E. Jelinski	Assistant Professor	0.25		0.75		Landscape Ecology
Ron J. Johnson	Professor	0.31	0.43		0.26	Wildlife Management
Terrence B. Kayes	Associate Professor	0.25	0.75			Aquaculture
Ned B. Klopfenstein	Assistant Professor				USDA	Forestry
Edward J. Peters	Associate Professor	0.40		0.60		Fisheries
Willis J. Rietveld	Professor				USDA	Agroforestry
Julie A. Savidge	Associate Professor	0.40		0.60		Wildlife
Michele M. Schoeneberger	Assistant Professor				USDA	Forestry
Horticulture						
Paul E. Read	Professor	0.43	0.33	0.24		Head, Plant Tissue Culture
Dermot P. Coyne	Professor	0.96		0.04		Vegetable Breeding
Roch E. Gaussoin	Assistant Professor	0.25	0.75			Turfgrass Management and Physiology
William A. Gustafson	Associate Professor	0.25	0.60	0.15		Fruit and Nut Crops
Laurie Hodges	Assistant Professor	0.40	0.60			Vegetable Production and Development
Garald L. Horst	Associate Professor	0.75		0.25		Turfgrass Physiology and Management
Ellen T. Paparozzi	Associate Professor	0.50		0.50		Ornamentals
Terrance P. Riordan	Professor	0.89		0.11		Turf Breeding
Sotero S. Salac[1]	Associate Professor	0.50		0.50		Ornamentals
Robert C. Shearman	Professor	0.20	0.30			Sustainable Turf Systems
Durward A. Smith	Associate Professor	0.18	0.27		0.55	Horticultural Food Crops Processing
IANR Communications and Information Technology						
Ted Hartung	Professor	0.12	0.14	0.10	0.64	Director
Richard L. Fleming	Professor	0.25	0.67	0.08		News
James W. King	Associate Professor	0.20	0.50	0.30		Publications/Visual Aids
Terrence Meisenbach	Assistant Professor	0.20	0.55		0.25	Publications
James K. Randall	Professor	0.10	0.90			Electronic Media

Plant Pathology

	Rank	Rsch	Ext	Tch	Other	Area of Responsibility
Anne K. Vidaver	Professor	0.75	0.15	0.10		Head
Martin B. Dickman	Associate Professor	0.85		0.15		Genetics of Host/Parasite Interactions
Roy C. French	Assistant Professor				USDA	Viruses and Nucleic Acids
Stan G. Jensen	Associate Professor				USDA	Corn and Sorghum Diseases
Leslie C. Lane	Associate Professor	0.85		0.15		Virus Diseases
Willem G. Langenberg[1]	Professor				USDA	Virus Diseases
Amit Mitra	Assistant Professor	1.00				Plant Vector/Plant Transformation
James E. Partridge	Associate Professor	0.85		0.15		Host/Parasite Interactions/Stress
Thomas O. Powers	Associate Professor	0.80		0.20		Nematology
James R. Steadman	Professor	0.90		0.10		Epidemiology of Vegetable Diseases
James L. Van Etten	Professor	0.90		0.10		Molecular Virology
John E. Watkins	Professor	0.25	0.75			Small Grains, Turf and Alfalfa
Gary Y. Yuen	Assistant Professor	0.85		0.15		Soilborne Diseases

Veterinary and Biomedical Sciences

John A. Schmitz	Professor	0.65	0.15	0.20		Head
Raul Barletta	Assistant Professor	0.90		0.10		Molecular Biology
Alex Chen	Associate Professor	0.90		0.10		Cellular Immunology
Catherine E. Dewey	Assistant Professor	0.50		0.35	0.15	Swine Medicine
Ruben O. Donis	Assistant Professor	0.85		0.15		Molecular Virology
Alan R. Doster	Professor				1.00	Diagnostic Pathology
Gerald E. Duhamel	Assistant Professor	0.80		0.10	0.10	Diagnostic/Research Pathology
E. Denis Erickson	Professor			0.30	0.70	Diagnostic Bacteriology
Dee Griffin	Associate Professor		0.30	0.50	0.20	Beef Cattle Medicine
Deborah L. Hamernik[1]	Assistant Professor	0.90		0.10		Transgenic Animal Systems
Clinton J. Jones	Associate Professor	0.90		0.10		Molecular Virology
Clayton L. Kelling	Associate Professor	0.90		0.10		Research Virology
Marjorie F. Lou	Professor	1.00				Research Biochemistry
Rodney A. Moxley	Associate Professor	0.35			0.65	Diagnostic/Research Pathology
Fernando Osorio	Associate Professor	0.50			0.50	Diagnostic/Research Virology
Louis J. Perino	Assistant Professor	0.30		0.50	0.20	Beef Cattle Medicine
Duane N. Rice	Professor		0.52	0.43	0.04	Dairy and Beef Cattle Diseases
Douglas G. Rogers	Associate Professor			1.00		Diagnostic/Research Pathology
Gary P. Rupp	Professor	0.30		0.50	0.20	Director, GPVEC, Beef Cattle Medicine
Norman Schneider	Associate Professor		0.25	0.50	0.25	Toxicology
S. Srikumaran	Associate Professor	0.85		0.15		Immunology
Barbara Straw[1]	Professor		0.80	0.10	0.10	Swine Diseases
Eva Wallner-Pendleton	Assistant Professor			0.60	.40	Poultry Diseases
Dale M. Webb[1]	Assistant Professor				1.00	Diagnostic Pathology

[1] Ended research appointment during 1994-1995
[2] Began research appointment during 1994-1995

	Rank	Rsch	Ext	Tch	Other	Department (Area of Responsibility)

College of Human Resources and Family Sciences

Family and Consumer Sciences

Shirley Baugher	Professor	0.37	0.11	0.52		Chair
Douglas A. Abbott	Associate Professor	0.25		0.75		Youth at Risk
E. Raedene Combs	Professor	0.25		0.75		Housing, Aged
Sheron Cramer[2]	Assistant Professor	0.25		0.75		Women/Economic Security
Elizabeth Davis	Associate Professor	0.25		0.75		Family Economics
John D. DeFrain	Professor	0.25		0.50		Youth at Risk
Brian Jory[2]	Assistant Professor	0.25		0.75		Family Violence
Jeanne Karns	Assistant Professor	0.25			0.61	Infant Social Development
William Meredith[2]	Professor	0.25		0.25	0.50	Youth at Risk
Kathy Prochaska-Cue	Associate Professor	0.25	0.75			Family Management
Mary Ellen Rider[2]	Assistant Professor	0.25	0.75			Consumer Health Policy
Craig W. Smith	Associate Professor	0.25		0.75		Family Interactions
Pauline Davey Zeece	Associate Professor	0.25		0.75		Child Care

Nutritional Science and Dietetics

Marilynn Schnepf	Associate Professor	0.40	0.10	0.30	0.20	Chair
Judy Driskell	Professor	0.50		0.50		Nutrition
Julie A. Albrecht	Assistant Professor	0.25	0.75			Food Safety
Nancy M. Betts	Associate Professor	0.49		0.51		Nutrition
Fayrene Hamouz	Assistant Professor	0.30		0.70		Restaurant Management
Nancy M. Lewis	Assistant Professor	0.44		0.56		Nutrition
Kaye Stanek	Associate Professor	0.25		0.75		Nutrition

Textiles, Clothing and Design

Rita C. Kean	Associate Professor	0.32	0.08	0.60		Chair, Merchandising
Patricia Cox Crews	Associate Professor	0.25		0.50	0.25	Textile Conservation and Science
Lois Hamilton	Assistant Professor	0.50			0.50	Industrial Use of Agricultural Products
Joan Laughlin	Professor	0.10	0.20	0.70		Textiles
Shirley M. Niemeyer	Associate Professor	0.25		0.75		Environmental Issues

Off-Campus Research and Extension Centers

Northeast Research and Extension Center

Robert D. Fritschen	Professor	0.25	0.67		0.08	Director
Michael C. Brumm	Professor	0.50	0.50			Animal Science (Swine Production)
William L. Kranz	Assistant Professor	0.25	0.75			Biological Systems Engineering (Water Quality)
Terry L. Mader	Professor	0.50	0.50			Animal Science (Beef Cattle)
David Holshouser	Assistant Professor	0.40	0.60			Agronomy (Weed Science)
Timothy A. Powell	Assistant Professor	0.40	0.60			Agricultural Economics (Farm Management)
Charles A. Shapiro	Associate Professor	0.50	0.50			Agronomy (Soils and Crop Nutrition)
David P. Shelton	Professor	0.50	0.50			Biological Systems Engineering (Soil Conservation)
John F. Witkowski	Professor	0.50	0.50			Entomology (Crop Insects and Chemigation)

	Rank	Rsch	Ext	Tch	Other	Department (Area of Responsibility)
Panhandle Research and Extension Center						
Charles A. Hibberd	Professor	0.42	0.50		0.08	Director
Burton A. Weichenthal	Professor	0.50	0.50			Associate Director and Animal Science (Beef Cattle)
David D. Baltensperger	Associate Professor	0.75	0.25			Agronomy (Crop Breeding)
Gregory D. Binford[1]	Assistant Professor	0.50	0.50			Agronomy (Soil Science)
Dale M. Grotelueschen	Associate Professor	0.50	0.50			Veterinary and Biomedical Sciences (Diagnostic)
Gary L. Hein	Associate Professor	0.50	0.50			Entomology (Entomology)
Eric D. Kerr	Professor	0.50	0.50			Plant Pathology (Plant Pathology)
Drew J. Lyon	Assistant Professor	0.50	0.50			Agronomy (Dryland Crops)
Alexander D. Pavlista	Associate Professor	0.25	0.75			Horticulture (Potatoes)
Patrick E. Reece	Associate Professor	0.50	0.50			Agronomy (Range and Forage)
Ivan G. Rush	Professor	0.25	0.75			Animal Science (Beef Cattle)
John A. Smith	Associate Professor	0.50	0.50			Biological Systems Engineering (Machinery Systems)
Robert G. Wilson	Professor	0.50	0.50			Agronomy (Weed Science)
C. Dean Yonts	Associate Professor	0.50	0.50			Biological Systems Engineering (Irrigation)
South Central Research and Extension Center						
Charles L. Stonecipher	Professor	0.14	0.78		0.08	Director
Joel Cahoon[1]	Assistant Professor	0.50	0.50			Biological Systems Engineering (Water Quality Management)
Benjamin L. Doupnik, Jr.[1]	Professor	0.50	0.50			Plant Pathology (Field Crop Diseases)
Roger Elmore	Associate Professor	0.50	0.50			Agronomy (Crop Production)
Richard Ferguson	Assistant Professor	0.50	0.50			Agronomy (Soil Fertility)
Fred W. Roeth	Professor	0.50	0.50			Agronomy (Weed Control/Water Quality)
Roger Selley	Associate Professor	0.25	0.75			Agricultural Economics (Farm Management)
Robert Wright	Associate Professor	0.50	0.50			Entomology (Biological Control)
Southeast Research and Extension Center						
Randy Cantrell[2]	Professor	0.05	0.87		0.08	Director
Loyd D. Young[1]	Professor	0.05	0.87		0.08	Director
DeLynn Hay[1,2]	Professor	0.05	0.87		0.08	Interim Director
West Central Research and Extension Center						
Pete W. Jacoby, Jr.	Professor	0.50	0.50			Director
Don D. Adams	Associate Professor	0.50	0.50			Animal Science (Range Cattle Nutrition)
John B. Campbell	Professor	0.50	0.50			Entomology (Livestock/Crops)
Richard Clark	Associate Professor	0.40	0.60			Agricultural Economics (Farm/Ranch Management)
Gene H. Deutscher	Professor	0.28	0.72			Animal Science (Beef Cattle Reproduction)
Gary W. Hergert	Professor	0.50	0.50			Agronomy (Soils/Water Quality)
Jerre Johnson	Professor				1.00	Veterinary and Biomedical Sciences (Diagnostic)
Norman L. Klocke	Associate Professor	0.50	0.50			Biological Systems Engineering (Water Resources)
Dale T. Lindgren	Associate Professor	0.50	0.50			Horticulture (Ornamentals)
Paul T. Nordquist	Professor	1.00				Agronomy (Sorghum/Corn Breeding)
Gail A. Wicks	Professor	0.50	0.50			Agronomy (Ecofarming/Weeds)

[1] Ended research appointment during 1994-1995
[2] Began research appointment during 1994-1995

Interdisciplinary Activities

Water Center/Environmental Programs

	Rank	Rsch	Ext	Tch	Other	Area of Responsibility
Robert G. Volk	Professor	0.75			0.25	Director
Shripat T. Kamble	Associate Professor	0.25	0.75			Pesticide Impact Assessment
Robert D. Kuzelka	Associate Professor	0.35	0.35		0.30	Assistant Director
Roy F. Spalding	Professor	0.25			0.75	Associate Director
Edward F. Vitzthum	Associate Professor	0.25	0.65	0.10		Coordinator, Environmental Programs

Agricultural Research Division

Darrell W. Nelson	Professor	1.00				Dean and Director
Dale H. Vanderholm	Professor	0.85			0.15	Associate Dean and Associate Director
Karen E. Craig	Professor	0.12	0.13		0.75	Assistant Director
Steven S. Waller	Professor	0.50		0.50		Assistant Dean and Assistant Director

Visiting Scientists/Research Associates

The Agricultural Research Division welcomed 27 visiting scientists and 38 research associates to the campus in 1994-1995. ARD research is complemented and enhanced by these collaborating scientists–it is through the sharing of knowledge and expertise that the field of science is advanced.

Visiting Scientists

Agricultural/Natural Resources Departments

	Country	Expertise/Discipline
Agronomy		
Rafel Alvarez	Venezuela	Plant Physiology
Berhane Biru	Ethiopia	Cropping Systems/ Water Utilizations
Kilada G. Ealadious	Egypt	Crop Physiology
Geremew Haile	Ethiopia	Corn Breeding and Genetics
Teshome Regassa	Ethiopia	Sorghum Drought Physiology
Amsal Tarekegne	Ethiopia	Wheat/Barley Physiology
Gyula Vida	Hungary	Plant Breeding and Genetics
Animal Science		
Lucia G. Albuquerque	Brazil	Dairy Genetics
Mingfeng Luo	People's Republic of China	Animal Genetics
Kamal K. Singhal	India	Ruminant Nutrition
Biochemistry		
Carlos S. Andreo	Argentina	Plant Enzymology
Cyril Appleby	Australia	Leghemoglobins
Manuel Becana	Spain	Biochemistry
Tetemke Mehari	Ethiopia	Biochemistry
Jose Moran	Spain	Biochemistry
Joaquin Moreno	Spain	Photosynthesis
Henrik Scheller	Denmark	Photosynthesis
Valerie Terwilliger	United States	Photosynthesis
Horticulture		
Graciela Godoy-Lutz	Dominican Republic	Plant Pathologist
Margaret T. Mmbaga	Tanzania, Africa	Plant Pathologist

	Country	Expertise/Discipline
Veterinary and Biomedical Sciences		
Sonia Estella	Argentina	Virology
Anselmo Odeon	Argentina	Bovine Viral Diarrhea
Mirolslav Polak	Poland	Virology
Jung Hyang Sur	Korea	Immunocytochemistry
Kazimierz Tarasiuk	Poland	Bacteriology
Panhandle Research and Extension Center		
Sam Geleta	Addis Ababa	Soil Service
Talat Mahmood	Pakistan	Entomology

Research Associates

	State/Country	Expertise/Discipline
Agronomy		
Kessavalou Anabayan	Nebraska/USA	Soil Science
Bahman Eghball	Nebraska/USA	Soil Science
Dennis Francis	Nebraska/USA	Soil and Water Science
John Lory	Minnesota/USA	Soil Science
Albert Sims	North Carolina/USA	Soil Science
Animal Science		
Curtis P. Van Tassell	New York/USA	Animal Genetics

	State/Country	Expertise/Discipline
Biochemistry		
Raùl Arredondo-Peter	Mexico	Biochemistry
S. Balajee	India	Microbiology
Don Becker	Minnesota/USA	Bioanalytical
Sarbani Chakraborty	India	Molecular Genetics
Stephen Duff	Canada	Plant Enzymology
Roel Funke	Netherlands	Plant Molecular
Mark F. Hammer	Arkansas/USA	Plant Physiology
Asma El Kasmi	Belgium	Physical Chemistry Electrochemistry
Irina Khrebtukova	Russia	Cell Biology
Manoj Kumar	India	Chemistry
N. Lakshmirani	India	Microbiology
Bin Li	China	Plant Biochemistry
Gururaj Maralihalli	India	Biochemistry
Raghavakaimal Padmakumar	India	Chemistry
Rugmini Padmakumar	India	Chemistry
Santha Ramakrishnan	India	Protein Purification and Protein Sequencing
Paul Scott	Denmark	Molecular Biology
Javier Seravalli	Costa Rica	Chemistry
S. Todd Swanson	California/USA	Chemistry
Shinichi Taoka	Japan	Biophysics
Ilia Vasseliev	Russia	Biophysics
Entomology		
Thomas E. Janousek	Texas/USA	Entomology
Rose Marie Rosario	South Carolina/USA	Entomology
Veterinary and Biomedical Sciences		
Nancy Hanson	Nebraska/USA	Microbiology
Ashfaque Hossain	United Kingdom	Microbiology
Jean De Dieu Okemba	Congo	Virology
Gene Palmer	Minnesota/USA	Microbiology
Nalini Raghavachari	India	Biochemistry
Subhaschandia Thaker	India	Microbiology/Immunology/Biochemistry
Ventzislev Vassilev	Russia	Molecular Virology
Guo-Ming Wang	China	Biochemistry
Horticulture		
Craig Sandlin	California/USA	Plant Pathologist

Research Projects

Each faculty member with an ARD appointment has a federally-approved research project. A number of faculty have multiple projects. There are 362 research projects in agriculture, natural resources and family sciences. Projects are generally 3-5 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 60 regional projects in which they conduct cooperative research with scientists at other universities, addressing problems of regional and national importance.

Research projects are listed by departments. An asterisk (*) indicates that the project was discontinued in fiscal year 1994-1995.

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

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

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

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

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

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

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

Competitive Grants: includes research in USDA national priority areas.

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

Agricultural Economics

***10-103 ha**
Price spreads and market structure in the beef marketing industry: theory and measurement (A. M. Azzam)

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

10-107 ha
Management information and management practices on Nebraska farms/ranches (H. D. Jose)

10-108 ha
Monitoring and analysis of farm real estate market development in Nebraska (B. B. Johnson)

10-109 ha
Nebraska water law (J. D. Aiken)

10-111 rr
Quantifying long-run agricultural risks and evaluating farmer responses to risk (D. M. Conley, G. Helmers)

10-112 ha
Legal aspects of national and international regulations of agricultural trade (R. L. McGeorge)

***10-113 sg**
Impacts of federal agricultural policy on rural communities (S. Cordes, J. Royer, P. Gessaman)

10-114 ha
Labor management of farms in size transition (R. E. Massey)

10-115 ha
Evaluating alternative risk management strategies for Nebraska grain producers (T. Park)

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

10-118 ha
Economics of beef cattle management systems in Nebraska (G. H. Pfeiffer)

10-119 rr
Policy implications for farm household and rural community responses to economic changes (B. Johnson)

10-120 ha
Structure, efficiency, and viability of agribusiness organizations (J. S. Royer)

10-121 ha
Sustainable communities: community response to institutional change (J. C. Allen)

10-122 cg
Development and application of specific technology assessment techniques (R. K. Perrin)

10-123 sg
Policy impacts on rural communities (S. M. Cordes, J. S. Royer, J. C. Allen)

10-124 ha
Economic analysis of farm management and public policy alternatives for improving groundwater quality (R. J. Supalla, J. C. Allen)

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

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

10-127 cg
The impact of cropland diversion program on rural population change and farm numbers (E. Van der Sluis)

10-128 ha
Economics, environment, and new agricultural technology (W. L. Miller)

Agricultural Leadership, Education and Communication

18-001 st
Dissemination of research information (T. Meisenbach)

***24-030 st**
Evaluation of interventions in leadership development programs (R. D. Dillon, E. H. Miller)

24-031 st
Impacting agricultural literacy of elementary students and teachers through teacher workshops (O. S. Gilbertson)

24-032 st
The determinants and uses of leadership influence in agriculture (F. William Brown)

Agricultural Meteorology

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

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

27-005 ha
A climate data base and model for estimating crop yields (K. G. Hubbard)

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

27-008 rr
Variables in agricultural-weather information systems (K. G. Hubbard)

27-009 ha
Climate and agroecosystem modeling: developing information for decision making (A. Weiss)

27-010 rr
Environmental and genotypic control of assimilate allocation in grain crops (S. B. Verma, T. J. Arkebauer)

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

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

***27-013 st**
Ultraviolet radiation interactions in a vegetative canopy (E. A. Walter-Shea)

27-014 ha
The consequences of climate variation and change for agriculture and other natural resources (W. E. Easterling)

27-015 sg
Developing drought mitigation and preparedness technologies in the U.S. (D. A. Wilhite)

Agronomy

***12-001 ha**
Corn breeding and genetics (W. A. Compton, P. T. Nordquist)

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

12-011 ha
Changes in soil properties associated with changes in land use over the past century (D. T. Lewis)

12-055 ha
Genetics, breeding and evaluation of common wheats, durums and triticales for Nebraska (P. S. Baenziger)

12-072 rr
Introduction, multiplication, evaluation, preservation, cataloguing and utilization of plant germplasm (D. J. Andrews, K. P. Vogel)

12-135 rr
Soil productivity and erosion (A. J. Jones)

12-149 st
Breeding sorghum and pearl millet for U.S.A. and developing countries (D. J. Andrews)

12-151 ha
Tillage influence on crop production and physical properties of the soil surface and rhizosphere (A. J. Jones)

12-173 ha
Evaluating plant nutrient needs and product quality (K. D. Frank)

12-174 rr
Market quality of hard wheat for domestic and international foods (D. Shelton)

***12-178 ha**
Dissipation and bioavailability of herbicides and other pesticides in soil (P. J. Shea)

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

12-184 ha
Soybean breeding and genetic studies for Nebraska (G. L. Graef)

12-185 ha
Methodology of comparing best management practices for groundwater quality protection (W. L. Powers)

12-186 ha
Popcorn breeding for yield and expansion volume (quality) (N. D'Croz-Mason, M. Thomas-Compton)

12-187 ha
Molecular characterization of genetic variation in soybeans (D. J. Lee)

12-190 ha
Leafy spurge: analysis of genetic variation by cpDNA characterization (D. J. Lee)

***12-191 cg**
Exploring the interface of qualitative and quantitative variation (P. S. Baenziger)

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

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

Did you know?

IANR food *scientists have developed a process that removes about two-thirds of the cholesterol from egg yolks. This process creates a natural dried egg product that tastes and bakes like a regular egg.*

12-195 ha
Biometrical genetics, selection theory and methods and germplasm improvement in maize (B. Johnson)

12-196 ha
Reaction of synthetic organic compounds with the inorganic components of soils (D. L. McCallister)

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

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

12-199 ha
Herbage and livestock production potential from native warm-season grasses (B. E. Anderson, L. E. Moser)

12-201 st
Maintenance, increase and distribution of elite germplasm (R. Helsing)

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

12-203 ha
Flow of water and particles in soils and porous media (D. Swartzendruber)

12-204 rr
Biological and ecological basis for a weed management model to reduce herbicide use in corn (D. A. Mortensen, R. G. Wilson, S. J. Nissen)

***12-205 sg**
Establishing Eurasian origin(s) of North American leafy spurge using DNA markers (S. Nissen, R. A. Masters, D. Lee)

12-206 rr
Water and carbon economy of plants in relation to rhizospheric and atmospheric dynamics (T. J. Arkebauer)

12-207 ha
Maize production practice influence on grain and stover yield and quality (S. C. Mason)

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

12-210 rr
Environmental and genotypic control of assimilate allocation in grain crops (T. J. Arkebauer, S. B. Verma)

12-211 rr
Environmental and genotypic control of assimilate allocation in grain crops (M. D. Clegg, J. W. Maranville, J. D. Eastin)

12-212 ha
Water relations, gas exchange and growth of plants and canopies (T. J. Arkebauer)

12-213 ha
Resource efficient cropping systems for Nebraska (C. A. Francis)

12-214 rr
Nutrient management to sustain productivity while protecting surface and groundwater quality (D. H. Sander, D. T. Walters)

12-215 st
Integrated weed management to improve grasslands of the Central Great Plains (R. A. Masters)

12-216 st
Resource efficient crop production systems (M. D. Clegg, S. C. Mason)

12-217 st
Nutrient use efficiency in sorghum and pearl millet (J. W. Maranville)

12-218 st
Soil and crop management practices for erosion control and sustained productivity (J. W. Doran, L. N. Mielke, W. W. Wilhelm, J. R. Ellis, J.F. Power, J. E. Gilley, G. E. Varvel)

***12-219 st**
Management of soil, water, and nitrogen resources to protect groundwater quality (J. S. Schepers, W. W. Wilhelm, L. E. Stetson, G. E. Varvel, J. F. Power, J. W. Doran)

12-220 ha
Selecting wheat and other cereal grains for enhanced end-use performance characteristics (D. R. Shelton, P. S. Baenziger, C. J. Peterson, R. A. Graybosch)

12-221 ha
Physiology, growth, and development of selected perennial forage grasses (L. E. Moser)

12-222 ha
Physiological evaluation of cultural and genetic factors influencing seasonal and instantaneous WUE (J. D. Eastin)

12-223 sg
A sampling strategy to better assess the vertical movement of agrichemicals (W. L. Powers, P. J. Shea, D. B. Marx)

12-224 ha
Soil and crop management effects on the nitrogen cycle (D. T. Walters)

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

12-226 ha
Determination of carbon tetrachloride transport coefficients in porous media (J. Skopp)

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

12-228 ha
Increasing fertilizer efficiency for grain crops (D. H. Sander)

12-229 cg
Calibration of residual soil nitrate for predicting supplemental N for sorghum (D. H. Sander, K. D. Frank, E. J. Penas)

12-230 ha
Transport, reactions, and fate of organic contaminants in soil (S. D. Comfort)

12-231 ha
Application of cytogenetics and molecular genetics to maize improvement (S. M. Kaeppler)

12-232 sg
Influence of genetic variation in North American leafy spurge on *Aphthona nigriscutis* (S. J. Nissen, R. A. Masters, D. J. Lee, M. L. Rowe)

12-233 cg
Exploring the interface of qualitative and quantitative genetics (P. S. Baenziger, Y. Yen)

***12-234 st**
Cloning differences between plant genomes (S. M. Klaepper)

12-235 st
Influence of novel and alien genes on the end-use quality of hard winter wheat (R. A. Graybosch)

12-236 cg
Events, processes and conditions influencing the stability of weed distributions (D. A. Mortensen, C. A. Gotway, L. J. Young, A. R. Martin)

12-237 st
Impact of pesticide residues in composted lawn waste on vegetable crops (P. J. Shea, L. Hodges, G. A. Horst, C. L. Stuefer-Powell, J. D. Carr)

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

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

12-240 cg
Chromosome specific libraries for maize genome research (S. M. Kaeppler, K. Arumuganathan, H. F. Kaeppler)

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

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

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

Animal Science

13-036 rr
Dairy herd management strategies for improved decision making and profitability (R. J. Grant, H. D. Jose)

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

13-071 ha
Utilization of byproducts in grain diets fed to feedlot cattle (R. A. Stock, T. J. Klopfenstein, T. L. Mader)

13-080 ha
Factors regulating protein turnover and growth in skeletal muscle (S. J. Jones)

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

13-087 ah
Uterine function in the bovine with luteal phase deficiency (J. E. Kinder, R. J. Kittok)

***13-090 ha**
Muscle proteolysis and meat tenderness (C. R. Calkins, S. J. Jones)

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

13-097 rr
The genetics of body composition in beef cattle (M. K. Nielsen, R. J. Rasby)

13-098 ha
Role of gonadotropin heterogeneity in reproductive function (H. E. Grotjan, J. E. Kinder)

13-099 ah
Acidosis and metabolic disorders (R. A. Stock, T. J. Klopfenstein)

13-100 ha
Physiological and nutritional aspects of improving reproduction in dairy cattle (L. L. Larson)

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

***13-102 cg**
Regulation of ovarian follicular development by circulating progesterone in the bovine (J. E. Kinder)

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

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

***13-106 ha**
Nutritional value of cereal grains for poultry (T. W. Sullivan, D. J. Andrews, P. S. Baenziger)

13-107 ha
Copper and zinc in beef cow reproduction (D. Brink, R. J. Rasby)

13-108 ha
Enhancing reproductive efficiency of boars (D. G. Levis)

13-109 rr
Genetic regulation of pork production (R. K. Johnson)

13-110 rr
Factors regulating protein synthesis, degradation and growth in skeletal muscle (S. J. Jones)

13-111 ha
Processed and manufactured meat technology (R. W. Mandigo)

13-112 ha
Protein and energy constraints of rapid lean growth (P. S. Miller, A. J. Lewis)

13-113 ha
Regulation of gonadotropin synthesis and secretion and ovarian follicle development pre- and postpuberty (J. E. Kinder, R. J. Kittok)

13-114 st
Feed quality improvement of sorghum grain (R. A. Stock, J. J. Pedersen)

13-115 ha
Evaluation of cow/calf weaning management systems to lower feed inputs and to improve economic efficiency (R. J. Rasby, D. R. Brink, R. A. Stock)

13-116 rr
Genetic enhancement of health and survival for dairy cattle (J. F. Keown)

13-117 cg
Ovarian follicular development in prepubertal heifers: role of LH, FSH and estradiol (J. E. Kinder)

13-118 ha
Factors affecting calcium transport in the avian small intestine and egg shell quality (S. S. Scheideler)

13-119 ha
Nitrogen metabolism in *Prevotella ruminicola:* a molecular genetics approach (M. Morrison)

13-120 ha
Testicular modulation of luteinizing hormone secretion (R. J. Kittok, J. E. Kinder, H. E. Grotjan)

***13-121 st**
The effects upon rumen microbiology from feeding distillers byproducts (M. Morrison, R. A. Stock)

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

13-123 ah
Estrogen-calcium relationships during onset of metabolic bone disease in laying hens (M. M. Beck)

13-124 cg
Molecular biology of protein degradation and utilization by *Prevotella ruminicola* (M. Morrison)

13-125 cg
Persistent ovarian follicles: role of progestine and LH in cows (J. E. Kinder)

Did you know?

Nearly all of the improved perennial grasses growing in Nebraska pastures are rooted in collaborative forage research by IANR and USDA scientists at UNL. Improvements have boosted forage digestibility and yields. These grasses also are environmentally beneficial, helping protect water quality and prevent soil erosion.

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

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

Biochemistry

15-022 rr
Regulation of photosynthetic processes (R. Chollet)

15-040 rr
Regulation of photosynthetic processes (J. P. Markwell)

15-049 rr
Enhancing beneficial microorganisms in the rhizosphere (R. V. Klucas)

15-050 ha
Functional hemoglobins in plants (R. V. Klucas)

15-054 ha
Isotope fractionation in biological systems (M. H. O'Leary)

15-055 ha
Structure, function and mechanisms of action of peptidases (F. W. Wagner)

***15-056 ha**
Analysis and metabolism of oxysterols (R. Dam)

15-058 ha
Genetic modification of chloroplast rubisco (R. J. Spreitzer)

15-059 ha
Structure and chemistry of compounds involved in the interactions between wheat and hessian fly (H. W. Knoche)

15-060 ha
Structure, function and organization of photosystem I reaction center (J. H. Golbeck)

15-061 rr
Environmental and genotypic control of assimilate allocation in grain crops (F. W. Wagner)

15-062 ha
Mammalian cobalamin-dependent enzymes (R. Banerjee)

15-063 ha
Enzymology of anaerobic CO_2 fixation and bioremediation (S. W. Ragsdale)

15-064 ha
Structure and function of the ribozyme, ribonuclease P (S. C. Darr)

15-065 cg
Ribonuclease P from the chloroplast and nucleus of *Chlamydomonas reinhardtii* (S. C. Darr)

15-066 cg
Molecular-genetic/biochemical studies of C_4 PEPC and PPDK phosphorylation cycles (R. Chollet)

15-067 ha
Regulation of photosynthetic processes (R. J. Spreitzer, M. H. O'Leary)

15-069 ha
Chloroplast thylakoid protein phosphatase (J. P. Markwell)

15-070 st
Development of dicamba-tolerant plants (D. P. Weeks, P. L. Herman)

15-071 cg
Genetic modification of chloroplast rubisco (R. J. Spreitzer)

9103384 cg
Maintaining functional leghemoglobin in legume modules (R. V. Klucas)

Biological Systems Engineering

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

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

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

11-081 ha
Electronic image measurement, modeling, and control of plant growth for improved agriculture profitability (G. E. Meyer)

11-082 ha
Decision support systems for the agricultural producer (G. E. Meyer)

11-083 ha
Starch graft copolymers (M. A. Hanna)

11-084 ha
Systems approach to improved energy and water use in greenhouses (D. D. Schulte, G. E. Meyer, J. B. Fitzgerald)

11-085 ha
Evaluation of tractor performance and test data (L. L. Bashford)

11-086 ha
Development of engineering tools to enhance grain industry profitability (D. D. Jones)

11-087 ha
Fertigation techniques for furrow-irrigated crops using surge irrigation (D. G. Watts)

***11-088 sg**
Movement of agricultural chemicals beneath conservation tilled-furrow irrigated land (D. E. Eisenhauer, R. B. Ferguson, F. W. Roeth, R. F. Spalding)

11-089 rr
Environmental and genotypic control of assimilate allocation in grain crops (G. E. Meyer)

11-090 rr
Modeling responses of growing pigs (D. D. Schulte)

***11-091 st**
Development of engineering solutions for machine control systems for handicapped farmers (L. I. Leviticus, M. F. Kocher)

11-092 sg
Risk-cost management for nitrate-contaminated groundwater uncertainties (M. F. Dahab, W. E. Woldt, I. Bogardi)

11-093 ha
Development and evaluation of sensors and control systems for seed handling and delivery (M. F. Kocher)

11-094 ha
Use of global positioning system in production agriculture (L. L. Bashford)

11-095 sg
Improvement of water quality by use of a sensor-controlled intermittent sprayer (K. VonBargen, G. E. Meyer, D. A. Mortensen)

11-096 ha
Waste management: disposal site characterization and hazard assessment (W. E. Woldt)

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

11-098 rr
Integrated systems for improved water and nitrogen management in irrigation environments (D. L. Martin, D. G. Watts, N. L. Klocke)

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

11-100 cg
Process scale-up: catalytic partial oxidation of erucic acid to brassylic acid (L. D. Clements)

11-101 cg
Program management and planning for advanced materials from renewable resources (L. D. Clements)

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

Biometry

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

Entomology

17-045 rr
Black fly damage thresholds, biology and control (K. P. Pruess)

17-047 rr
Spatial dynamics of leafhopper pests and their management on alfalfa (S. D. Danielson)

17-048 ha
Ecology and management of legume insects (S. D. Danielson)

17-049 ha
Molecular taxonomy of black flies (K. P. Pruess, T. O. Powers)

17-050 ha
Integrated management of stable flies and house flies on confined livestock (G. D. Thomas, J. J. Petersen, S. R. Skoda)

17-051 ha
Arthropods associated with buffalograss and other turfgrasses in Nebraska (F. P. Baxendale)

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

17-055 ha
Physiological consequences and management of arthropod leaf injury to plants (L. G. Higley)

17-056 ha
Determinants of insecticide toxicity in resistant pest and non-target aquatic insect species (B. D. Siegfried)

17-057 ha
Genetic factors associated with the development of aphid biotypes and insecticide resistance (Z B Mayo)

17-058 ha
Biology, ecology, and management of diabrotica species (L. J. Meinke)

17-059 rr
Development of sustainable IPM strategies for soybean arthropod pests (L. G. Higley)

17-060 rr
A national agricultural program to clear pest management agents for minor use (S. Kamble)

Food Science and Technology

16-033 rr
Marketing and delivery of quality cereals and oilseeds in domestic foreign markets (L. B. Bullerman)

16-044 rr
Factors regulating protein synthesis, degradation and growth in skeletal muscle (M. G. Zeece)

16-048 rr
Development of new processes and technologies for the processing of poultry products (G. W. Froning)

***16-050 ha**
Genetics and physiology of *Streptococcus thermophilus* (R. W. Hutkins)

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

16-052 ha
Analytical methods for food process control and measurement of processing induced changes (R. L. Wehling)

16-053 ha
Role of proteinase inhibitors in protein degradation (M. G. Zeece)

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

16-055 ha
Food allergies and sensitivities (S.L. Taylor, J. H. Rupnow)

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

16-057 ha
The design of an enzyme reactor for the conversion of hemicellulose to monosaccharides (M. M. Meagher)

16-058 ha
Occurrence, control and prevention of pathogenic bacteria in foods (S. S. Sumner)

16-059 ha
Identification, purification and characterization of bacteriocins and their evaluation as agents (J. H. Rupnow)

16-060 ha
Evaluation and characterization of antioxidants from plant sources (S. L. Cuppett)

***16-061 st**
Utilization of poultry skin (G. W. Froning, S. L. Cuppett, R. W. Mandigo, S. S. Sumner, C. L. Weller)

16-062 cg
Characterization of wheat proteins and their relationship to breadmaking quality (R. L. Wehling, M. G. Zeece, D. R. Shelton)

16-063 cg
Physiological studies on *Listeria monocytogenes* (R. W. Hutkins, T. Conway)

16-064 cg
Control of pathogenic microorganisms of fresh fruits and vegetables (S. S. Sumner, L. B. Bullerman, J. A. Albrecht)

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

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

Forestry, Fisheries and Wildlife

***26-011 ms**
Windbreak shelter effects (J. R. Brandle)

26-012 ms
Biology, ecology, and control of dioryctria borers of pines (M. O. Harrell)

***26-013 ha**
Ecology and enhancement of wildlife populations in Nebraska (J. A. Savidge)

26-014 ha
Wildlife damage management for sustainable systems (R. J. Johnson)

26-016 st
Integrated pest management – vertebrates in Nebraska (S. E. Hygnstrom)

26-017 ha
Water quality and water quantity criteria for Nebraska fishes (E. J. Peters)

26-018 rr
Avian species in diverted farmland (J. A. Savidge)

26-019 ha
Primary water quality determinants of attached algal communities in Nebraska (K. D. Hoagland)

26-020 ha
Evaluation of environmental factors and fish species for aquaculture development in Nebraska (T. B. Kayes)

26-021 ms
Molecular mechanisms associated with cellular homeostasis and differentiation in plants (S. G. Ernst)

26-022 st
Wildlife and sustainable agroecosystems (R. M. Case)

26-023 ms
Windbreak shelter effects (J. R. Brandle, L. Hodges)

26-024 ms
Effects of landscape structure on biodiversity and ecosystem processes (D. E. Jelinski)

Horticulture

20-036 ha
Genetics, breeding and cultural interactions of dry edible beans (*Phaseolus vulgaris* L.) (D. P. Coyne, J. R. Steadman, A. K. Vidaver, D. S. Nuland)

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

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

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

20-051 ha
Physiology and development of turfgrasses for low resource requiring environments (G. L. Horst)

20-052 ha
Introduce and develop high value crops from hardy wood plant germplasm for the North Central Region (W. A. Gustafson, Jr.)

20-053 ha
Breeding and development of buffalograss and other low maintenance species for Central Great Plains (T. P. Riordan)

20-054 ha
Establishment and management of turf-type buffalograsses (R. E. Gaussoin)

Plant Pathology

21-012 st
Electron microscopy in agricultural research (W. G. Langenberg, E. M. Ball)

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

***21-039 rr**
Reduction of corn losses caused by nematodes in the North Central Region (T. O. Powers, E. D. Kerr)

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

21-041 ha
Pathogenic determinants of phytopathogenic fungi (M. B. Dickman)

21-042 ha
Characterization and genetics of bacterial plant pathogens and endophytic bacteria (A. K. Vidaver)

21-043 ha
Detection and properties of plant viruses of Nebraska (L. C. Lane)

21-044 ha
Biological control of soilborne diseases of dry bean and turfgrass with antagonistic bacteria (G. Y. Yuen)

21-046 ha
Host-parasite interactions between fungal pathogens and their hosts (J. E. Partridge)

21-047 st
Development of vectors and their use in plant transformation and plant gene regulation studies (A. Mitra)

21-048 ha
Investigations of management strategies for control of rusts, leaf spots, and blights of winter wheat and turfgrass (J. E. Watkins)

21-049 ha
Epidemiology of diseases of dry edible beans and other vegetables in Nebraska (J. R. Steadman)

***21-050 sg**
Genetic engineering of crop plants to *Sclerotinia* resistance (A. Mitra, M. B. Dickman)

21-051 cg
Enhanced nematode diagnostics by polymerase chain reaction (T. O. Powers)

***21-052 cg**
Fungal zoospore mediated transfer of foreign DNA into plants (A. Mitra, W. G. Langenberg)

21-053 ha
PCR based approaches for identification and epidemiology of parasite nematodes (T. O. Powers)

21-054 sg
Genetic basis for pathogenicity in the genus *Colletotrichum* (M. B. Dickman)

Did you know?

IANR *researchers are leaders in developing improved irrigation techniques to save water and money. IANR studies show scientifically-based irrigation scheduling reduces water use by 11 percent. Improved surface irrigation efficiency cuts water use another 15 percent.*

21-055 st
Avirulence gene D from *Pseudomonas* in a suicide gene (J. E. Partridge)

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

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

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

Veterinary and Biomedical Sciences

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

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

14-039 st
Nebraska SPF swine laboratory (J. A. Schmitz)

***14-054 rr**
Research in support of a national eradication program for pseudorabies (F. A. Osorio, A. Hogg)

14-055 ah
Pathogenesis of diseases due to bovine viral diarrhea virus infections in cattle (C. L. Kelling, R. O. Donis, G. E. Duhamel, M. B. Rhodes, S. Srikumaran)

14-058 ah
Molecular characterization of bovine viral diarrhea virus and its interaction with the host (R. O. Donis)

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

***14-060 sg**
Molecular characterization of bovine herpes virus 1-host cell receptor interactions (S. Srikumaran, C. J. Jones, R. J. Krueger)

***14-063 cg**
Modulation of latent pseudorabies virus infections by vaccines: a quantitative analysis (F. A. Osorio, C. J. Jones)

14-064 st
Development and evaluation of a parturition detection device (G. P. Rupp)

14-065 sg
Is the latency related gene of BHV-1 necessary for latent infection of cattle (C. J. Jones, F. A. Osorio)

14-066 ha
Functional analysis of the BHV-1 latency related gene (C. J. Jones)

14-067 st
Evaluation and modulation of bovine immune function (L. J. Perino)

***14-069 ha**
Regulation of expression of the receptor for follicle-stimulating hormone (FSH) in cattle (D. L. Hamernik)

***14-070 cg**
Regulation of bovine herpes virus 1 transcription during latent infection (C. J. Jones)

14-071 cg
Site-directed mutagenesis of the p125 polypeptide of bovine viral diarrhea virus (R. O. Donis)

***14-072 rr**
Reproductive performance in domestic ruminants (D. L. Hamernik)

14-074 cg
Molecular cloning and characterization of the cellular receptor for bovine herpes virus I (S. Srikumaran, C. J. Jones, S. R. Thaker)

***14-075 cg**
Regulation expression of the GnRH gene in ruminants (D. L. Hamernik)

14-076 ah
Molecular analysis of the bovine immune system: dissection of mammary gland T cell repertoire (S. S. A. Chen)

14-077 ah
Molecular genetics analysis of *Mycobacterium paratuberculosis* and related mycobacterial pathogens (R. G. Barletta)

14-078 ah
Role of group A bovine rotavirus P protein antigenic epitopes in immunity and infection (G. E. Duhamel)

14-079 st
Synergism between bacteroids spp. and *Serpulina hyodysenteriae* in swine dysentery (G. E. Duhamel, M. Morrison, R. A. Moxley)

14-080 st
How does the fungal toxin, fumonisin, induce carcinogenesis (C. J. Jones, M. A. Dickman)

14-081 cg
Analysis of the bovine herpes virus I latency related gene (C. J. Jones)

14-082 cg
Cellular molecules mediating bovine viral diarrhea virus infection (R. O. Donis)

14-083 cg
Prevention of alpha herpers virus latency by homologous interference (F. A. Osorio, A. K. Cheung, C. J. Jones)

14-084 st
An epidemiological investigation of swine productivity in Nebraska (C. K. Dewey)

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

Human Resources and Family Sciences

Family and Consumer Sciences

***92-015 ha**
Understanding problems and possibilities of independent living for the rural elderly (E. R. Combs)

92-016 rr
Rural households at risk of serious housing problems in the North Central Region (E. R. Combs)

92-017 ha
Factors influencing older consumers' experience and satisfaction with health insurance (K. Prochaska-Cue)

92-018 ha
The infant as a group participant (J. Karns)

92-019 sg
Housing affordability in rural areas (K. Prochaska-Cue, E. R. Combs, E. P. Davis)

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

***93-023 ha**
The social and psychological aftermath of serious motor vehicle accidents (J. D. DeFrain)

***93-024 ha**
Nebraska's youth at risk, assessing the problem (J. C. Woodward)

93-025 ha
The influence of volunteer companion programs on self-competence and family relationships of children (D. A. Abbott, W. H. Meredith)

93-026 ha
Assessing change in rural head start families (P. D. Zeece)

93-027 ha
Coping and adaptation among Nebraska's farm/ranch and rural families during periods of transitions (C. W. Smith)

Did you know?

NebHERB, *an IANR-developed computer program, helps farmers and crop consultants decide whether weeds merit post-emergent herbicide treatment. The program integrates years of IANR research into a user-friendly software available through NU Cooperative Extension. It's part of an overall research effort to effectively control weeds with less herbicide.*

Nutritional Science and Dietetics

91-020 rr
Nutrient bioavailability – a key to human nutrition (J. A. Driskell)

91-025 rr
Health maintenance aspects of dietary recommendations designed to modify lipid metabolism (N. M. Lewis)

91-032 ha
Assessment of vitamin B-6 requirements of adults (J. A. Driskell)

91-033 ha
Nutrient composition of meats and vegetables as consumed (J. A. Driskell, J. Albrecht, F. Hamouz, N. Lewis, M. Schnepf)

91-034 ha
Nutrition problems of older adults in Nebraska and methods of changing food behavior (N. M. Betts)

91-035 ha
Nutrition status and family history of chronic disease in young Nebraska women (N. M. Lewis)

91-036 ha
Consumption and nutrient content and retention of vegetables and their health implications (J. A. Albrecht)

91-037 rr
Behavioral and health factors that influence the food consumption of young adults (N. M. Betts)

91-038 ha
The use of natural antioxidants to control warmed-over flavor in meats (M. Schnepf)

91-039 ha
Nutrient intake, eating behaviors, and anthropometric measurements of young children in Nebraska (K. Stanek)

91-040 st
Antioxidant incorporation in edible films for maintaining meat quality (M. Schnepf, F. Hamouz, S. L. Cuppett, R. W. Mandigo)

91-041 ha
Meat cookery and quality concepts for the food service industry (F. Hamouz)

Textiles, Clothing and Design

94-017 rr
Rural retailing: impact of change on consumer and community (R. C. Kean)

94-019 rr
Assessment of the environmental compatibility of textile and other polymeric materials (P. Cox-Crews)

94-020 ha
Situational and personal factors in residential waste management: the impacts of markets, resources, and attitudes (S. M. Niemeyer)

94-021 rr
Family business: interaction of work and family spheres (R. C. Kean)

Off-Campus Research Centers

Northeast Research and Extension Center

42-007 ha
Feedlot management and production considerations for the cattle feeder (T. L. Mader, H. D. Jose)

42-010 ha
Improving feeder pig performance (M. C. Brumm)

42-014 ha
Biology and control of the European corn borer and other selected insects of northeast Nebraska (J. F. Witkowski)

***42-015 ha**
Interpretation of swine enterprise records for increased understanding of profitability relationships (T. A. Powell)

42-016 ha
Management practices to enhance performance of weaned pigs (M. C. Brumm, D. P. Shelton)

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

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

42-019 ha
Increasing fertilizer use efficiency in northeast Nebraska (C. A. Shapiro)

42-020 ha
Effects of preplant tillage and nitrogen application method on nitrate leaching (W. L. Kranz)

42-021 ha
Development of integrated pest management techniques for improved weed management (D. L. Holshouser)

Panhandle Research and Extension Center

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

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

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

***44-036 ha**
Control of *Heterodera schachtii* and *Cercospora beticola* on sugar beet in the Nebraska Panhandle (E. D. Kerr)

***44-040 ha**
Influence of grazing frequency and date on Nebraska Sandhills vegetation (P. E. Reece)

44-041 ha
Studies of perennial grass tiller, rhizome, and root dynamics designed to develop grazing management strategies (P. E. Reece)

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

44-043 ha
Development of integrated pest management systems for major insect pests of crops in the Nebraska Panhandle (G. L. Hein)

44-044 ha
Sugar beet planters – plant spacing and emergence performance (J. A. Smith, C. D. Yonts, S. D. Kachman)

44-045 ha
Resource efficient dryland cropping systems for western Nebraska (D. J. Lyon)

44-046 ha
Nutrient management of irrigated and dryland crops in western Nebraska (G. D. Binford)

44-047 cg
Wheat curl mite population dynamics and epidemiology of wheat streak mosaic (G. L. Hein, R. C. French, D. J. Lyon, J. E. Watkins)

44-048 ha
Control of rhizomania and nematode diseases in sugar beet (E. D. Kerr)

44-049 st
New seedbed preparation technology for improved sugar beet emergence (J. A. Smith, R. G. Wilson, G. D. Binford)

44-050 ha
Improvement of proso millet and other crops for western Nebraska (D. D. Baltensperger)

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

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

46-010 rr
Increased efficiency of lamb production (K. A. Leymaster, L. D. Young, G. E. Dickerson, R. M. Koch)

46-012 rr
The genetics of body composition in beef cattle (R. M. Koch, L. V. Cundiff)

South Central Research and Extension Center

***48-004 rr**
Occurrence of mycotoxins in feeds and the implications to animal and human health (B. L. Doupnik, Jr.)

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

***48-017 st**
Investigations on the epidemiology and control of maize chlorotic mottle virus (B. Doupnik, Jr., R. J. Wright, L. J. Meinke, S. Jensen, L. Lane, D. Wysong)

48-018 ha
Blocked and open end furrow irrigation system management (J. E. Cahoon)

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

48-020 ha
Nitrogen management factors influencing utilization efficiency and loss processes to the environment (R. B. Ferguson)

48-021 sg
Factors influencing spatial yield and N use efficiency of furrow-irrigated corn (R. B. Ferguson, G. W. Hergert, J. E. Cahoon, T. A. Peterson, C. A. Gotway)

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

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

West Central Research and Extension Center

43-024 ha
Biology, ecology, economics and control of major insects affecting livestock (bovine) in Nebraska (J. B. Campbell)

43-033 rr
Bionomics, vector capabilities and management strategies for face flies (J. B. Campbell)

43-042 ha
Sorghum and corn breeding and corn, sorghum, and wheat variety evaluation under central Nebraska environmental conditions (P. T. Nordquist)

43-047 ha
Selection and development of native herbaceous landscape plants (D. T. Lindgren)

43-049 ha
Increasing fertilizer nitrogen use efficiency in west central Nebraska (G. W. Hergert)

43-050 ha
Beef nutrition and production systems for Sandhills rangeland (D. C. Adams)

43-051 sg
Quantifying nitrate leaching under continuous corn versus a corn-soybean rotation (G. W. Hergert, N. L. Klocke)

43-052 ha
Quantifying year-round leaching losses in structured soil with percolation lysimeters (N. L. Klocke)

43-054 ha
Evaluation of management practices to improve reproductive efficiency of beef heifers (G. H. Deutscher, D. C. Adams)

43-055 ha
Weed control management in reduced tillage systems (G. A. Wicks)

43-056 ha
Interaction of trace minerals as related to prenatal supplementation of the pregnant beef cow (J. L. Johnson)

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

Interdisciplinary Activities

Administration

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

01-004
Regional research coordination, North Central Region (D. W. Nelson)

Agricultural Research and Development Center

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

Center for Sustainable Agriculture Systems

31-001 sg
Integrated crop/livestock research for sustainable systems in Nebraska (C. A. Francis)

31-002 st
Center for Sustainable Agricultural Systems (C. A. Francis)

31-003 cg
Biological and economic consequences of flexible crop rotations (C. A. Francis)

Food Processing Center

19-002 sg
Development and quality/safety enhancement of specialty food products (S. L. Taylor, D. Neumeister)

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

19-004 sg
Midwest food manufacturing alliance (S. L. Taylor)

Industrial Agricultural Products Center

***29-001 sg**
Nonfood agricultural products project (M. A. Hanna)

***29-002 sg**
Investigating milkweed as an alternative source of fiber (M. A. Hanna)

29-003 cg
Reactive processing for starch grafts (M. A. Hanna)

29-004 sg
Industrial agricultural products center (M. A. Hanna)

29-005 cg
Non-edible wheat gluten films for use as mulch and bags (W. M. Ghorpade, C. L. Weller)

Water Center/Environmental Programs

25-003 sg
Participation in the national agricultural pesticide impact assessment program (S. T. Kamble)

***30-001 sg**
Management of irrigated corn and soybeans to minimize groundwater contamination (D. G. Watts, R. F. Spalding)

30-002 sg
Sprinkler irrigation as a remedial technique for VOC-contaminated groundwater (R. F. Spalding)

30-003 sg
Management of irrigated corn and soybeans to minimize groundwater contamination (D. G. Watts)

Did you know?

The manufacturer of a leading herbicide for velvetleaf control in soybeans lowered the product's recommended application rate based on IANR research, cutting herbicide costs and use. An IANR weed scientist showed that using the herbicide at half rate with a fertilizer additive gave better control and caused less soybean injury than full rate. In 1986, Nebraska soybean growers saved nearly $2.8 million in herbicide costs on 341,000 acres as the result of this reduced rate. This treatment is now standard in Nebraska, where it is used on over a million acres annually and in surrounding soybean-producing states.

Publications

Publications in refereed (peer reviewed) scientific journals represent professional acknowledgement of the value of a research finding to the discipline. ARD scientists have published in a number of different scientific journals during 1994. Faculty also have written books, edited books or contributed book 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 referred journals, books, book chapters, theses and dissertations are listed for calendar year 1994.

Journals in which faculty have published in 1994

Agricultural Economics

Agricultural Systems
The Journal of Development Studies
Agribusiness: An International Journal
American Journal of Agricultural Economics
Review of Agricultural Economics
Journal of Sustainable Agriculture
Journal of Agricultural Cooperation
Transactions of the American Society of Engineers

Agricultural Meteorology

Agricultural and Forest Meteorology
Water International

Agronomy

Soil Science Society of America Journal
Agronomy Journal
Analytical Chimica Acta
Journal of Soil and Water Conservation
Applied Geochemistry
Journal of Production Agriculture
American Journal of Alternative Agriculture
Fluid Journal
Fertilizer Research
Journal of Biological Chemistry
Crop Science
Natural Areas Journal
Journal of Plant Nutrition
Applied Experience in Agriculture
Genome
European Journal of Agronomy
Weed Technology
Micorrhiza
Soil Tillage Research
Plant Breeding
Weed Science
Journal of Sustainable Agriculture
Applied Geochemistry
The Science of the Total Environment
Journal of Environmental Quality
Plant Physiology
Better Crops with Plant Food
Transactions of the American Society of Agricultural Engineers
Theoretical and Applied Genetics
Agricultural and Forest Meteorology

Animal Science

Journal of Range Management
Biology of Reproduction
HortScience
Journal of Animal Science
Journal of Dairy Science
Small Ruminant Research
Nutrition Research
Journal of Soil and Water Conservation
Journal of Andrology
Metabolic Brain Disease
Biology of Reproduction
Journal of Nutrition
Animal Feed Science and Technology
Journal of Poultry Science
Brazilian Journal of Genetics

Biochemistry

Journal of Biological Chemistry
Science
Biochemistry
Planta
Plant Physiology
Plant Science
Archives of Biochemistry and Biophysics
Plant Molecular Biology
Journal of Bacteriology
Photosynthesis Research
Analytical Biochemistry

Biological Systems Engineering

Transactions of the American Society of Agricultural Engineers
Computers and Electronics in Agriculture
Bioresource Technology
Cereal Chemistry
Irrigation Science
Journal of Production Agriculture
Industrial Crops and Products
Journal of Irrigation and Drainage Engineering
Weed Technology
Applied Engineering in Agriculture
Journal of Food Science
Food Structure
Poultry Science

Biometry

Journal of the American Society of Horticultural Science
Journal of Range Management
Crop Science
Technometrics
Journal of Animal Science
Wildlife Society Bulletin
Journal of the American Dietetic Association
Plant Breeding
Journal of Plant Nutrition
Applied Engineering in Agriculture
Biometrical Journal

Entomology

Journal of Economic Entomology
Journal of the Kansas Entomological Society
Environmental Entomology
Biological Control
Journal of Insect Biochemistry and Molecular Biology
Agronomy Journal
Proceedings of National Academy of Science
Pesticide Biochemistry and Physiology
Journal of the Lepidopterists' Society
Advances in Insect Physiology
American Zoologist
Journal of Insect Physiology
Comparative Biochemistry and Physiology
Annals Entomological Society of America

Food Science and Technology

Journal of Dairy Science
Bioresource Technology
Journal of Food Protection
Cereal Chemistry
Science des Aliments
Applied Environmental Microbiology
Journal of Poultry Science
Industrial Crops and Products
Journal of American Oil Chemists Society
BioPharm
Journal of Food Science
Journal of Agricultural and Food Chemistry
Separation Science Technology
Food Structure
Starch/Starke
Bioseparations
Journal of Food Safety
Journal of Muscle Foods

Forestry, Fisheries and Wildlife

Tree Physiology
Journal of Arboriculture
Journal of Soil and Water Conservation
Phytoparasitica
Wildlife Society Bulletin
Transaction of the American Fisheries Society
Hydrobiologia
Rivers

Horticulture

Journal of American Society for Horticultural Science
Journal of the Kansas Entomological Society
HortScience
Crop Science
Journal of Plant Nutrition
Crop Protection

Plant Pathology

Journal of American Society of Horticultural Science
Applied and Environmental Microbiology
HortScience
Journal of Virolology Methods
Nucleic Acids Research
Journal of Nematology
Annals of Applied Biology
Plant Molecular Biology
Biochemical Biophysica Research Communication
Biochemica of Biophysica Acta.
Plant Physiology
Virology
Phytopathology
Canadian Journal of Plant Pathology
Plant Disease
Crop Protection

Veterinary and Biomedical Sciences

Molecular Carcinogenesis
Veterinary Microbiology
Journal of Clinical Microbiology
American Journal of Veterinary Research
Virus Research
Canadian Journal of Veterinary Research
Viral Immunology
Biology of Reproduction
Journal of Veterinary Diagnostic Investigations
Journal of Virological Methods
Journal of Virology
Journal of General Virology
Journal of Poultry Science
Compendium on Continuing Education for the Practicing Veterinarian
Agriculture Practice
Journal of Nutrition

College of Human Resources and Family Sciences

Family and Consumer Sciences

Journal of Comparative Family Studies
Journal of Psychology
Journal of Family and Economic Issues
International Journal of Sociology of the Family
Activities, Adaptation and Aging
Day Care and Early Education

Nutritional Science and Dietetics

Ecology of Food and Nutrition
Nutrition Research
Journal of the American Dietetic Association
Home Economics Research Journal
Journal of Food Quality
Journal of Consumer Studies and Home Economics

Textiles, Clothing and Design

Journal of Environmental Polymer Degradation
Journal of Consumer Studies and Home Economics
Reviews of Environmental Contamination and Toxicology
Journal of Travel Research
Clothing and Textiles Research Journal

Off-Campus Research Centers

Northeast Research and Extension Center

Applied Engineering in Agriculture
Agronomy Journal
Journal of Animal Science
Journal of Nutritional Education

Panhandle Research and Extension Center

Theriogenology
Journal of American Veterinary Association
Agricultural Practice
Veterinary and Human Toxicology
American Potato Journal
Journal of Economic Entomology
Veterinary Microbiology
Weed Technology
Journal of Range Management
Horticulture Technology
Ecology and Epidemiology
HortScience

South Central Research and Extension Center

Irrigation Science
Journal of the Kansas Entomological Society

West Central Research and Extension Center

Journal of Range Management
Journal of Economic Entomology
Food Reviews International
HortScience
Journal of Production Agriculture
Veterinary and Human Toxicology
Agriculture Practice
Biological and Cultural Tests for Control of Plant Diseases
Journal of Soil and Water Conservation
Weed Science
Agricultural Systems
Journal of Animal Science

On-Campus Research Center

Water Center/Environmental Programs

Journal of Environmental Entomology
Journal of Economic Entomology
Journal of Insect Biochemistry and Molecular Biology
Journal of Environmental Quality
The Science of the Total Environment
Applied Geochemistry

Research Publications (1994)

Agricultural Economics

Journal Articles

Azzam, A., M. Baker, I. Berry, and J. Campbell. 1994.
An exploratory bioeconomic model of pesticide use for controlling feedlot cattle pests. Agricultural Systems 48:503-513. (J. Series No. 10341)

Azzam, A. and M. Moussaoui. 1994.
Least-cost bread-flour mix: a prototype policy model for Morocco. The Journal of Development Studies 11:33-42. (J. Series No. 10340)

Azzam, S. and A. Azzam. 1994.
A network model that determines the optimal path of breed crossing decisions to maximize net returns. Agricultural Systems 45:145-154. (J. Series No. 9463)

Conley, D.M. 1994.
Hedging ratios and effectiveness for diesel fuel and gasoline in the Northern Plains. Agribusiness: An International Journal 10:305-317. (J. Series No. 10362)

Frasier, W.M. and G.H. Pfeiffer. 1994.
Optimal replacement and management policies for beef cattle. American Journal of Agricultural Economics 76:847-858. (J. Series No. 10197)

Lohr, L. and T. Park. 1994.
Discrete/continuous choices in contingent valuation surveys: soil conservation decisions in Michigan. Review of Agricultural Economics 16:1-15. (J. Series No. 9994)

Lohr, L. and T. Park. 1994.
Supply elasticities and responses to relative price changes in organic produce markets. Journal of Sustainable Agriculture 6:43-57. (J. Series No. 10368)

Royer, J.S. 1994.
Economic nature of the cooperative association: a retrospective appraisal. Journal of Agricultural Cooperation 9:86-94. (J. Series No. 10606)

Wilmes, G.W., D.L. Martin, and R.J. Supalla. 1994.
Decision support systems for design of center pivots. Transactions of the American Society of Agricultural Engineers 37:165-175. (J. Series No. 10277)

Book

Allen, J.C. and D.A. Dillman. 1994.
Against All Odds: Rural Community in the Information Age. Westview Press, Boulder, CO.

Book Chapters

Bhuyan, S. and J.S. Royer. 1994.
Agricultural cooperatives and vertical integration: a theoretical analysis, p. 179-186. *In:* American Cooperation 1994, National Council of Farmer Cooperatives, Washington, D.C.

Cobia, D.W., J.S. Royer, and G. Ingalsbe. 1994.
Equity redemption, p. 346-371. *In:* D.W. Cobia (ed.), Cooperatives in Agriculture [Japanese translation]. All In One Books, Okawa-gun, Kagawa-ken, Japan.

Cordes, S., G.A. Doeksen, and R. Shaffer. 1994.
Rural economic development and health services, p. 27-56. *In:* J.E. Beaulieu and D.E. Berry (eds.), Rural Health Services: A Management Perspective, AUPHA/Health Administration Press, Ann Arbor, MI.

Helmers, G.A. and D. Hoag. 1994.
Sustainable agriculture, p. 111-131. *In:* M.L. Hallberg, R.G.F. Spitze, and D.E. Ray, (eds.), Food, Agriculture, and Rural Policy Into the Twenty-First Century. Westview Press, Boulder, CO.

Perrin, R.K. 1994.
Intellectual property rights in economic development, p. 499-516. *In:* J.R. Anderson (ed.), Agricultural Technology: Policy Issues for the International Community. CAB International, Wallingford, U.K.

Ray, D.E. and A.L. Frederick. 1994.
The economic setting for U.S. agriculture, p. 3-24. *In:* M.C. Hallberg, R.G.F. Spitze, and D.E. Ray (eds.), Food, Agriculture, and Rural Policy into the Twenty-First Century. Westview Press, Boulder, CO.

Royer, J.S. 1994.
Taxation, p. 372-398. *In:* D.W. Cobia (ed.), Cooperatives in Agriculture [Japanese translation]. All In One Books, Okawa-gun, Kagawa-ken, Japan.

Royer, J.S. and S. Bhuyan. 1994.
Market incentives for cooperative forward integration into processing activities, p. 35-57. *In:* R.W. Cotterill (ed.), Competitive Strategy Analysis for Agricultural Marketing Cooperatives. Westview Press, Boulder, CO.

M.S. Theses

Balimwacha, Z. 1994.
Price transmission asymmetry and market structure in the beef and pork industry. (A. Azzam and D. Conley, Advisors)

Elmore, S. 1994.
Economic characteristics and policy implications for the land under the Conservation Reserve Program contracts in Nebraska. (R. T. Clark and M. E. Baker, Advisors)

Sandell, C. 1994.
Profitable soybean marketing strategies for Nebraska producers. (D. Conley, Advisor)

Ph.D. Dissertation

Moussaoui, Mohamed. 1994.
An *ex ante* evaluation of the interactions between risk behavior and technology adoption in Morocco's dryland agriculture: The case of bread wheat supplementary irrigation. (A. Azzam and G. A. Helmers, Advisors)

Agricultural Meteorology

Journal Articles

Arkebauer, T.J., A. Weiss, T.R. Sinclair, and A. Blum. 1994.
In defense of radiation use efficiency: a response to Demetriades-Shah et al. (1992). Agricultural and Forest Meteorology 68:221-227. (J. Series No. 10292)

Hubbard, K.G. 1994.
Spatial variability of daily weather variables in the High Plains of the U.S.A. Agricultural and Forest Meteorology 68:29-41. (J. Series No. 10338)

Wilhite, D.A. and S.R. Rhodes. 1994.
State-level drought planning in the United States: factors influencing plan development. Water International 19:15-24. (J. Series No. 9623)

Book

Wilhite, D.A. and D.A. Wood (eds.) 1994.
Drought Management in a Changing West: New Directions for Water Policy. Proceedings of a Conference. IDIC Technical Series 94-1, University of Nebraska-Lincoln, Lincoln, NE.

Book Chapters

Blad, B.L. 1994.
Micro-scale patterns of the climatic elements, p. 148-153. *In:* J.F. Griffiths (ed.), Handbook of Agricultural Meteorology. Oxford University Press, New York, NY.

Did you know?

An *IANR weed scientist has developed a reduced-rate herbicide and cultivation combination that can yield full-strength broadleaf weed-fighting power in soybeans. This integrated system cuts chemical use and costs in half compared with conventional full-rate treatment. That's a $1,200 to $1,400 savings on 200 acres of soybeans.*

Hubbard, K.G. 1994. Measurement systems for agricultural meteorology, p. 76-81. *In:* J.F. Griffiths (ed.), Handbook of Agricultural Meteorology. Oxford University Press, New York, NY.

Verma, S.B. 1994. Measurement of the exchange of heat and mass between the atmosphere and a crop, p. 115-118. *In:* J.F. Griffiths (ed.), Handbook of Agricultural Meteorology. Oxford University Press, New York, NY.

Weiss, A. 1994. From crop modeling to information systems for decision making, p. 285-290. *In:* J.F. Griffiths (ed.), Handbook of Agricultural Meteorology. Oxford University Press, New York, NY.

Wilhite, D.A. 1994. Summary of working group discussions and recommendations, p. 185-203. *In:* Drought Management in a Changing West: New Directions for Water Policy. IDIC Technical Series 94-1, University of Nebraska-Lincoln, NE.

Wilhite, D.A. 1994. Workshop #2: Establishment of a regional/national drought mitigation center (workshop summary), p. 19-27. *In:* Drought Management in a Changing West: New Directions for Water Policy. IDIC Technical Series 94-1, University of Nebraska-Lincoln, Lincoln, NE.

Marasco, T. and D.A. Wilhite. 1994. Water resources survey: results and summary, p. 209-224. *In:* Drought Management in a Changing West: New Directions for Water Policy. IDIC Technical Series 94-1, University of Nebraska-Lincoln, Lincoln, NE.

Agronomy

Journal Articles

Ali, A.-S.I. and D. Swartzendruber. 1994. An infiltration equation to assess cropping effects on soil water infiltration. Soil Science Society of America Journal 58:1218-1223. (J. Series No. 9085)

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Boldt, A.L., D.G. Watts, D.E. Eisenhauer, and J.S. Schepers. 1994. Simulation of water-applied nitrogen distribution under surge irrigation. Transactions of the American Society of Agricultural Engineers 37:1157-1165. (J. Series No. 10588)

Brubaker, S.C., A.J. Jones, K. Frank, and D. Lewis. 1994. Regression models for estimating soil properties by landscape position. Soil Science Society of America Journal 58:1763-1767. (J. Series No. 10001)

Cassada, D.A., R.F. Spalding, Z.Cai, and M.L. Gross. 1994. Determination of atrazine, deethylatrazine and deisopropylatrazine in water and sediment by isotope dilution gas chromatography-mass spectrometry. Analytical Chimica Acta 287:7-15. (J. Series No. 10459)

Eghball, B., L.N. Mielke, D.L. McCallister, and J.W. Doran. 1994. Distribution of organic carbon and inorganic nitrogen in a soil under various tillage and crop sequences. Journal of Soil and Water Conservation 49:201-205. (J. Series No. 10038)

Eghball, B. and J.F. Power. 1994. Beef cattle feedlot manure management. Journal of Soil and Water Conservation 49:113-122. (J. Series No. 10301)

Eskridge, K.M., C.J. Peterson, and A.W. Grombacher. 1994. Probability of quality traits falling within acceptable limits. Crop Science 34:866-869. (J.Series No. 10418)

Exner, M.E. and R.F. Spalding. 1994. N-15 identification of non-point sources of nitrate contamination beneath cropland in the Nebraska Panhandle: two case studies. Applied Geochemistry 9:73-81. (J. Series No. 10485)

Francis, C.A. 1994. Practical applications of agricultural systems research in temperate countries. Journal of Production Agriculture 7:39-40, 151-157. (J. Series No. 10306)

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Gardner, J.C., J.W. Maranville, and E.T. Paparozzi. 1994.
Nitrogen use efficiency among diverse sorghum cultivars. Crop Science 34:728-734. (J. Series No. 9441)

Graef, G.L., J.E. Specht, L.L. Korte, and D.M. White. 1994.
Registration of 'Holt' soybean. Crop Science 33:356-357. (J. Series No. 10000)

Graybosch, R.A., C.J. Peterson, J.-H. Lee, and D. R. Shelton. 1994.
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Horst, G.L., W.L. Powers, D.R. Miller, P.J. Shea, and E.A. Wickland. 1994.
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Sander, D., D. Walters, and K. Frank. 1994.
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IANR *meat scientists are boosting the value of lower-value meats by modifying and recombining them to create restructured meat products. This effort helps the beef industry by turning less desirable meats into higher-value products and provides consumers with a wider array of meat products, often with less fat.*

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IANR *research is providing environmentally friendly alternatives for home lawns and golf courses. IANR horticulturists have developed improved turf-type buffalograsses that need 50 percent less water and fertilizer than most conventional turfgrasses. IANR released two varieties well-suited to Nebraska conditions in 1993 and sod and pre-rooted plugs from these varieties are sold commercially. Seed from IANR-developed turf buffalograss also was available to the public for the first time in 1995.*

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Did you know?

Corn *producers who use soil and water nitrate tests and follow IANR irrigation recommendations typically use 20 percent less fertilizer.*

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College of Human Resources and Family Sciences

Family and Consumer Sciences

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Off-Campus Research Centers

Northeast Research and Extension Center

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Did you know?

Recent fruits of IANR research include more than a dozen new crop varieties, plus genetic materials for breeding improved crops. In 1992 and 1993 alone, Agricultural Research Division scientists released 14 new horticultural and field crop varieties bred for top performance under Nebraska conditions. IANR also has released new germplasms, or genetic plant materials, for public and private breeders to use in developing better crops. All releases result from ongoing research. IANR is committed to providing new plant materials for Nebraska.

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Journal Articles

Davis, R.W. and S.T. Kamble. 1994.
Low temperature effects on survival of the eastern subterranean termite. Journal of Environmental Entomology 23:1211-1214. (J. Series No. 10544)

Exner, M.E. and R.F. Spalding. 1994.
N-15 identification of non-point sources of nitrate contamination beneath cropland in the Nebraska Panhandle: two case studies. Applied Geochemistry 9:73-81. (J. Series No. 10485)

Prabhakaran, S.K. and S.T. Kamble. 1994.
Subcellular distribution and characterization of esterase isozymes from insecticide resistant and susceptible strains of German cockroach. Journal of Economic Entomology 87:541-545. (J. Series No. 10420)

Prabhakaran, S.K. and S.T. Kamble. 1994.
Purification and characterization of an esterase isozyme from insecticide resistant and susceptible strains of German cockroach. Journal of Insect Biochemistry and Molecular Biology 25:519-524. (J. Series No. 10772)

Snow, D.D. and R.F. Spalding. 1994. Uranium isotopes in the Platte River drainage basin of the North American High Plains Region. Applied Geochemistry 9:271-278. (J. Series No. 10188)

Spalding, R.F. and J.D. Parrott. 1994. Shallow groundwater denitrification. The Science of the Total Environment 141:17-25. (J. Series No. 9956)

Spalding, R. F., D. D. Snow, D. A. Cassada, and M. E. Burbach. 1994.
Study of pesticide occurrence in two closely spaced lakes in northeastern Nebraska. Journal of Environmental Quality 23:571-578 (J. Series No. 10239)

Research Expenditures

ARD receives funding from federal formula funds, industry grants, federal grants and state appropriations. During fiscal year 1994-1995, faculty with ARD appointments obtained grant and contract funds that totaled $18,472,000. This amount represents 23 percent of all grant and contract funds received by UNL and 44.8 percent of all research funds obtained by UNL faculty. 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, 1994 through June 30, 1995

Federal Formula Funds:

Hatch Formula	$ 2,217,833
Regional Research	$ 845,303
McIntire-Stennis	$ 160,760
Animal Health	$ 210,958
Total Federal Formula Funds	$ 3,434,854
State Appropriated Funds	$24,789,589[1]

Contracts and Grants:

USDA Coop Agreements	$ 2,549,979
USDA Special & Competitive	$ 3,035,034
Federal Grants - (NSF, NIH, USEPA, AID, DOE)	$ 5,448,607[2]
Industry Grants	$ 4,612,145
Total Grants and Contracts	$15,645,765
Sub-Total	$43,870,208
Product Sales	$ 7,218,755
Total Expenditures	$51,088,963

[1]Includes $2,526,388 of Nebraska Research Initiative funds expended by ARD affiliated units.
[2]$313,200 was included to show actual Agricultural Research Division expenditures reflecting transfers from International Programs.

Agricultural Research Division
Research Investments By Category and Funding Source FY 1995

Expenditure Category	State Appropriated and Hatch Funds	Federal Grants	Industry Grants	Product Sales (Revolving Funds)	All Funds
	percent of total within source				
Salaries, Wages and Benefits					
Faculty/Administrative	38.3	3.9	4.5	1.1	22.4
Managerial/Professional	11.4	8.7	5.0	3.7	9.0
Office/Service	12.8	11.9	10.2	17.0	12.9
Hourly Wages	0.6	5.5	7.8	3.7	2.8
GRA Stipends	6.1	18.1	18.9	1.1	9.2
Benefits	13.7	8.8	7.5	5.7	10.8
Subtotal:	82.9	57.0	53.9	32.3	67.1
Operating					
Supplies and Expenses	12.6	31.5	34.6	54.4	24.9
Travel	0.4	4.2	6.8	3.5	2.4
Equipment	4.0	7.3	4.7	9.9	5.6
Subtotal:	17.1	43.0	46.1	67.7	32.9
Total:	100.0	100.0	100.0	100.0	100.0

Agricultural Research Division
Selected Research Program Information

Category	FY 1993	FY 1994	FY 1995
Project Information:			
Projects at beginning of year	335	351	362
Projects terminating	40	24	40
Projects revised	14	8	9
New projects	56	35	44
Projects at the end of the year	351	362	366
Faculty full-time equivalents (FTE)	135.7	132.2	131.9
Support for budgeted research faculty:			
Federal formula and state approp./FTE[1]	$205,607	$208,408	$213,984
Grant and contract expenditures/FTE	$90,672	$101,649	$118,618
Product sale expenditures/FTE	$ 41,914	$ 54,234	$ 54,729
Outputs from research program:[2]			
Refereed journal articles	277	306	286
Research bulletins	3	4	1
Books and book chapters	49	70	77
M.S. and Ph.D. theses	129	132	129
Cultivars and germplasm released	14	6	17
Patents obtained	0	3	1

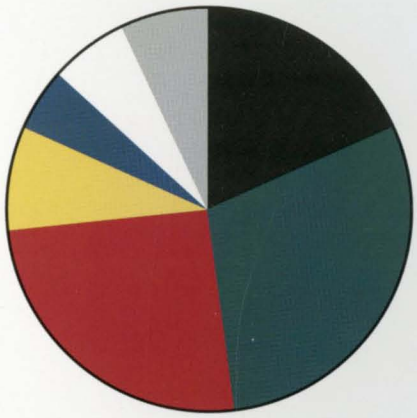
[1] Includes cost of administration, and expenditures from the Nebraska Research Initiative by ARD-affiliated faculty.

[2] A large number of abstracts, technical reports, and other non-refereed articles also are published by faculty each year.

Agricultural Research Division
Programmatic Distribution of Investments — FY 1994[1]

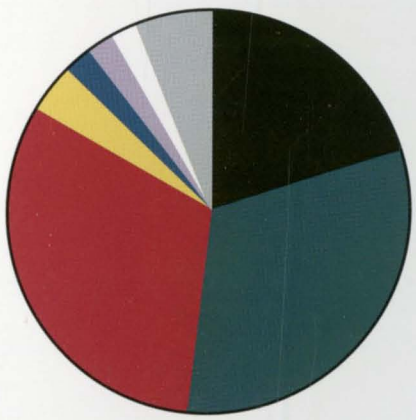
FY 94

I. Classification by Research Program Area



Natural Resources	*20.0%*
Crops (field and horticulture)	*36.9%*
Animals (including invertebrates)	*26.6%*
People and Communities	*5.1%*
Trade and Policy	*3.5%*
Food and Nutrition	*4.1%*
Other Technology	*3.8%*

II. Classification by Research Goal



Goal I.	*Wise Management of natural resources*	*18.3%*
Goal II.	*Protect from pests*	*22.3%*
Goal III.	*Ensure adequate supply of food*	*33.0%*
Goal IV.	*New products and improved processes*	*8.6%*
Goal V. *Goal VI.*	*Increase marketing efficiency, and* *Expand export markets*	*2.1%*
Goal VII.	*Protect health and improve nutrition*	*3.4%*
Goal VIII.	*Improved quality of life in rural areas*	*3.1%*
Goal IX.	*Promote community improvement*	*9.4%*

[1] Product sale income is not included in totals. Percentage investments in Research Program Areas and Research Goals represent the average proportions of total expenditures and scientific years.