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### Impact 2001

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# IMPACT 2001

**Institute of Agriculture and Natural Resources**  
**University of Nebraska**  
*Extension, Research and Teaching*

**Submissions to:**  
**Land-Grant/USDA**  
**Image Enhancement Project**  
**National Database**

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*About this project:* These impact statements feature some of IANR's research, extension and teaching efforts and were developed for the Land-Grant/USDA impact database. This national database is part of an ongoing effort to enhance the visibility, awareness and appreciation for land-grant university and USDA programs. The database is used in a variety of ways to provide information to members of Congress, their staffs and other decision-makers. The staff of CIT News and Publishing wrote the impacts contained in this booklet in cooperation with IANR administration. These were written in easily understandable, lay language and are deliberately brief to meet database and audience needs. A single-paragraph summary follows most impact statements. The main impact statements were submitted to the national database. The single-paragraph summaries after most impacts were written for local use, primarily for CIT News and Publishing's ongoing communications/marketing efforts on behalf of IANR's programs. These impacts are not a comprehensive listing of IANR accomplishments, but highlight some ongoing efforts. The national impact database contains previous years' submissions and is on the Web at: <http://www.reeusda.gov/success/impact.htm>. The Year 2001 database is expected to be open for public use later this spring.



## **Competitive Agricultural Systems in a Global Economy**

### **Topic: Nebraska Soils Home Study Course**

#### **Issue: (Who cares and why?)**

To remain competitive, farmers are looking for the best ways to manage their resources and improve crop production. University of Nebraska Cooperative Extension helps them do both through the Nebraska Soils Home Study Course.

#### **What has been done?**

In 1997, NU extension introduced the Nebraska Soils Home Study Course to teach soil composition, soil testing and nutrient management. Since then, more than 400 courses have been distributed to participants in Arizona, Colorado, Illinois, Kansas, Ohio, Nebraska and South Dakota. Participants work through 10 lessons at their own pace and convenience. In 1999, the course became available via the Internet, giving participants a choice in how they take the course. Although it was designed primarily for farmers, crop consultants and agribusiness professionals, others have participated, including horticulturists, engineering specialists and high school agricultural teachers.

#### **Impact:**

Sixteen course participants who were surveyed estimated the knowledge they gained helps them save between \$16 and \$20 per acre, for a total of \$274,000, based on the acreage they manage. One participant noted, "I can put things I learned to immediate use." The Nebraska Fertilizer and Agricultural Chemical Institute uses the course to provide 10 Certified Crop Advisor (CCA) credits for Certified Crop Consultants. The institute also recommends it as a resource for those studying for the CCA exam.

#### **Funding:**

User fees

NU Cooperative Extension

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#### **Summary:**

The Nebraska Soils Home Study Course provides producers, crop consultants and others around the country science-based information to help improve their management practices. Participants work through lessons at their own pace without leaving home. The course also is available via the Internet. More than 400 people have participated in the University of Nebraska Cooperative Extension course since it began in 1997. Those who completed the course estimate the information they gained is saving them between \$16 and \$20 per acre. One participant described the course as "very practical, easy to read and understand."

## **Competitive Agricultural Systems in a Global Economy**

### **Topic: Beginning Farmer Program**

#### **Issue: (Who cares and why?)**

Young people find getting into farming or ranching nearly impossible. The tremendous expenses in land and machinery, plus low commodity prices, make the profession cost-prohibitive unless they have a foot in the door from friends or relatives. At the same time, Nebraska's agricultural producers are aging. Almost 25 percent of the state's nearly 51,500 farmers and ranchers are over 65, while only 11 percent are under 35. As producers retire, fewer young people have the financial ability to take their place, leaving the question of who will farm Nebraska's soils.

#### **What has been done?**

University of Nebraska Cooperative Extension launched the Beginning Farmer Program in late 1999. The program works with potential and retiring producers, as well as those carrying extreme financial burdens. During 2000, Beginning Farmer took calls from 180 producers. Of those receiving individual assistance, 22 were for retirement planning and 16 were for financial transition problems. Nearly 100 calls were from beginning farmers who received information on financing and cash flow projections. Lenders and producers with father/son issues also sought assistance.

#### **Impact:**

Beginning Farmer personnel know some financing is available for beginning producers and understand the paperwork complexity. "There's no other way for a young guy to get started on his own," said one 30-year-old central Nebraska producer, who has realized his dream of renting his own farm and buying a cow herd, thanks to the program. Working through projected expenses and receipts helps beginning producers see for themselves whether farming or ranching will be right financially for them. Assuring that family farms and ranches remain an important part of Nebraska's economy, culture and communities is the program's ultimate goal.

#### **Funding:**

NU Cooperative Extension  
Smith-Lever 3(b) and (c)

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#### **Summary:**

It's nearly impossible for beginners to get into farming on their own. That's a problem, especially since almost one-fourth of the state's nearly 51,500 producers are retirement age. University of Nebraska Cooperative Extension's Beginning Farmer Program assists potential producers by working with them to determine expenses and receipts and connecting them with potential sources of financing. Assuring that family farms and ranches remain an important part of Nebraska's economy, culture and communities is the program's ultimate goal.

## **Competitive Agricultural Systems in a Global Economy**

### **Topic: Soybean Field Days**

#### **Issue: (Who cares and why?)**

Nebraska ranks fifth nationwide in soybean production. To be competitive in the ever-changing soybean market, growers must understand what drives global markets as well as how to protect crops and improve yields.

#### **What has been done?**

NU Cooperative Extension teams with the Nebraska Soybean Board and the United Soybean Board to offer Soybean Management Field Days, hands-on workshops where producers learn the latest soybean production, marketing and risk management information for maximizing efficiency. In 2000, more than 540 people attended the field days offered at four locations in Nebraska's soybean-growing areas. During the one-day sessions, extension staff and industry consultants provide tips on everything from weed management technology to new marketing opportunities to enhance soybeans' value.

#### **Impact:**

Field days participants in 2000 farmed or managed a total of more than 200,000 Nebraska soybean acres. Those surveyed estimated the knowledge gained at the sessions was worth about \$11 per acre or a total of \$2.27 million, based on the 540-plus participants and the acres managed. About 90 percent of participants surveyed said they expect to change their soybean field operations based on what they learned at the field days. "Hopefully, it will enhance my bottom line by putting more beans in the bin, reducing costs and improving marketing," one participant said.

#### **Funding:**

NU Cooperative Extension  
Nebraska Soybean Board  
United Soybean Board

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#### **Summary:**

Nebraska ranks fifth nationally in soybean production. To remain competitive, the state's soybean growers need the latest information on everything from emerging market trends to management options. NU Cooperative Extension teams with the Nebraska and United Soybean Boards to offer Soybean Management Field Days, which provide information to help producers maximize their efficiency. In 2000, more than 540 people attended four sessions around the state. Participants surveyed said the knowledge they gained at the field days is worth an average of about \$11 per acre or \$2.27 million in total value, based on the participants and acres involved. About 90 percent of those surveyed said they expect to change their soybean field operations after attending the one-day workshops. "Hopefully, it will enhance my bottom line by putting more beans in the bin, reducing costs and improving marketing," one participant said.

## Competitive Agricultural Systems in a Global Economy

### Topic: *E. coli* pen test

#### Issue: (Who cares and why?)

Devising strategies to control *E. coli* 0157:H7 on the farm should help keep the dangerous bacteria from reaching consumers. Finding simple, easy ways to test groups of cattle for 0157:H7 is a key step in developing on-farm food safety efforts.

#### What's been done?

Capitalizing on cattle's natural curiosity, University of Nebraska scientists devised a simple, effective, economical way to test pens of cattle without handling individual animals. They hang pieces of rope around a pen and within two hours, cattle chew or lick the ropes, leaving traces of the organisms they're carrying. Laboratory tests of the ropes detect *E. coli* 0157:H7. This test proved effective in on-farm studies. The team is refining it as a research tool and will use it to identify strategies producers can use to control *E. coli* 0157:H7 in feedlots. It's part of ongoing Institute of Agriculture and Natural Resources on-farm food safety research.

#### Impact:

The rope test allows researchers to identify environmental and management factors that influence the prevalence of *E. coli* 0157:H7 in pens of cattle throughout the feeding period and to evaluate the control strategies producers can use to reduce the likelihood of cattle leaving feedlots carrying the bacteria. While the rope test was devised as a research tool, it someday could help producers match food safety intervention strategies to specific pens of cattle.

#### Funding:

USDA National Research Initiative competitive grant  
Nebraska Beef Council  
Nebraska Legislative Bill 1206  
NU Agricultural Research Division  
Hatch Act

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#### Summary:

Capitalizing on cattle's natural curiosity, University of Nebraska scientists devised a simple, effective, economical way to test pens of cattle for *E. coli* 0157:H7 without handling individual animals. They hang pieces of rope around a pen, which cattle soon chew or lick, leaving traces of the organisms they're carrying. Laboratory tests of the ropes detect *E. coli* 0157:H7. The team is refining the rope test as a research tool and using it to identify strategies producers can use to control the bacteria in feedlots. This work is part of ongoing Institute of Agriculture and Natural Resources on-farm food safety research to control the dangerous bacteria on farms, ranches and feedlots to reduce the chances of it reaching consumers.

## **Competitive Agricultural Systems in a Global Economy**

### **Topic: Soybean gene mapping**

#### **Issue: (Who cares and why?)**

Some of today's most interesting maps chart the molecular world of genes, DNA and chromosomes. Knowing where key genes are located on a chromosome is important to harnessing those genes to develop better crops. University of Nebraska research helped create the first comprehensive genetic map for soybeans.

#### **What has been done?**

An NU Institute of Agriculture and Natural Resources soybean geneticist and his colleagues developed one of three soybean populations used to construct the first comprehensive genetic map for all 20 soybean chromosomes. The map was first published in October 1999 by researchers at Nebraska. Thanks to this research, more than 1,800 genetic markers — specialized DNA segments that simplify identification — now serve as landmarks on the soybean genetic map, identifying critical chromosome segments that are home to key genes.

#### **Impact:**

The genome map enables researchers to take a more targeted approach to soybean breeding. Genetic markers help breeders locate specific genes of interest. Once located, these genes can be used to create soybeans with desirable characteristics such as higher yields, greater disease resistance, or high protein or oil content. The map also is helping scientists better understand which genes govern specific traits. For example, the map already has aided NU soybean breeders' discoveries about the relationship between genes controlling yield potential and drought tolerance.

#### **Funding:**

Nebraska Soybean Board  
United Soybean Board  
USDA National Research Initiative competitive grant  
NU Agricultural Research Division  
Hatch Act

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#### **Summary:**

Some of today's most interesting maps chart the molecular world of genes, DNA and chromosomes. A University of Nebraska soybean geneticist and his colleagues created the first comprehensive genetic map of all 20 soybean chromosomes. The Institute of Agriculture and Natural Resources team developed one of the three populations used to construct the soybean map, which contains more than 1,800 genetic markers identifying critical chromosome segments. The genetic map speeds the plant breeding process by enabling scientists to target and harness specific genes responsible for important traits such as yield, disease resistance or high protein content. The map also is helping scientists better understand which genes govern specific traits.

## **Competitive Agricultural Systems in a Global Economy**

### **Topic: Switchgrass for biomass fuel**

#### **Issue: (Who cares and why?)**

Concerns about the global implications and availability of fossil fuels are spurring a search for environmentally friendly and renewable alternatives. Switchgrass, a native prairie grass that grows on even marginal land, is the U.S. Department of Energy's top candidate for biomass fuel production. Switchgrass someday could offer ag producers a reliable income source and a buffer against crop price swings.

#### **What's been done?**

A USDA-Agricultural Research Service plant geneticist at the University of Nebraska is developing improved, high-yielding switchgrass cultivars and management recommendations to maximize biomass production. He teamed with NU colleagues to explore the feasibility of hybrid switchgrass, develop molecular markers for genetic studies, study seed quality and fertility requirements, and determine the best herbicides for switchgrass establishment. Researchers think they'll reach their goal of producing improved switchgrass that yields 8-10 tons of biomass per acre on marginal land in the 25-inch rainfall zone by DOE's 2010 target date.

#### **Impact:**

Producing fuel from an environmentally friendly, renewable source such as switchgrass could benefit consumers, the environment and rural economies. It might eventually help reduce the need for foreign fossil fuel and provide farmers a way to earn income while they protect their marginal land. A pending USDA study predicts that switchgrass harvested for biomass fuel could significantly boost net farm income.

#### **Funding:**

U.S. Department of Energy  
USDA-ARS  
NU Agricultural Research Division  
Hatch Act

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#### **Summary:**

Turning switchgrass into ethanol could provide an environmentally friendly fossil fuel alternative and added income for rural economies. That's the goal of University of Nebraska and USDA-Agricultural Research Service research to develop improved switchgrass cultivars and management practices that will maximize yield for biomass fuel production. NU is the major research site for the Department of Energy's switchgrass biomass development program, which aims to produce ethanol from plant biomass. The research team's goal to produce 8 to 10 tons of biomass per acre on marginal land in the 25-inch rainfall zone is within sight; improved cultivars should be ready for planting by DOE's 2010 target date. A pending USDA report predicts that planting switchgrass as a bioenergy crop on marginal farmland would significantly boost U.S. net farm income.



## **Competitive Agricultural Systems in a Global Economy**

### **Topic: Drought Monitor**

#### **Issue: (Who cares and why?)**

Drought plagues at least 10 percent to 18 percent of the nation annually, costing \$6 billion to \$8 billion. While it is the costliest natural disaster, drought's slow, creeping nature makes it hard to predict and monitor, which is important for reducing its catastrophic effects.

#### **What has been done?**

University of Nebraska researchers at the National Drought Mitigation Center helped develop and now maintain a new nationwide drought tracking system, called the Drought Monitor. Launched in August 1999, this web-based monitor combines several drought and water indices in a single, simple, colorful map showing where drought is emerging, lingering or subsiding nationwide. Frequent updates highlight emerging trouble spots so state and federal officials can take steps to reduce drought's impacts. NU Institute of Agriculture and Natural Resources researchers collaborated with USDA and the National Oceanic and Atmospheric Administration on this project, which is the first to consolidate scientific data from numerous sources into a single, simple format.

#### **Impact:**

The Drought Monitor fills a nationwide need for timely, user-friendly information to improve drought tracking and to characterize its severity. It's estimated that more than a million people used the monitor in its first year. Major media nationwide, including The Weather Channel, use the monitor in some form. While it was primarily designed for drought and water planners, the monitor's wide use and simple format are increasing public awareness of drought. Alabama, Florida, Georgia, Oklahoma, Nebraska and South Carolina are among numerous states using the Drought Monitor in some form to better monitor, plan and respond to drought.

#### **Funding:**

USDA  
National Drought Mitigation Center  
NU Agricultural Research Division  
Hatch Act

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#### **Summary:**

A new drought tracking system that University of Nebraska researchers helped develop is improving drought monitoring nationwide. Institute of Agriculture and Natural Resources scientists at the NU-based National Drought Mitigation Center teamed with scientists at two federal agencies to develop the Drought Monitor, an easily understood, web-based tool for tracking widespread drought. The monitor combines information from several drought and water indices in a single map showing where drought is emerging, lingering and subsiding. It highlights emerging trouble spots so state and federal agencies can work to reduce drought's impacts. It's estimated that more than a million people used the monitor in 1999, its first year. State and federal agencies use the monitor in their drought planning and response efforts.

## **Competitive Agricultural Systems in a Global Economy**

### **Topic: Monitoring Bt susceptibility**

#### **Issue: (Who cares and why?)**

The long-term effectiveness of Bt corn, which produces its own natural insecticide toxic to European corn borers, hinges on preventing this multimillion dollar corn pest from becoming resistant to Bt. Early detection of potential changes in the insect's susceptibility to Bt is critical to nationwide resistance management efforts.

#### **What has been done?**

University of Nebraska entomologists developed tests to detect changes in European corn borer susceptibility to Bt. They use them to check corn borer populations nationwide for Bt resistance annually. Institute of Agriculture and Natural Resources entomologists began working with seed companies in 1993, before Bt corn was commercialized, to establish baseline information on corn borer susceptibility to Bt across North America. Baseline information allows them to detect potential changes in corn borer susceptibility as Bt plantings expand. While there are limits to the tests' sensitivity, researchers have seen no change in the six years that Bt corn has been registered. Corn borers nationwide remain susceptible to Bt toxins.

This Nebraska lab is responsible for assessing and keeping records on corn borer Bt susceptibility nationwide. This research is funded by seed companies, which must provide annual susceptibility measurements as part of federal requirements for selling Bt seed corn.

#### **Impact:**

Baseline data, diagnostic tests and annual monitoring are important for preserving Bt's effectiveness. Annual tests should provide early warning if resistance begins to develop in certain corn borer populations. The goal is to detect changes before resistance becomes widespread so further steps can be taken to preserve Bt's effectiveness.

#### **Funding:**

Seed companies  
NU Agricultural Research Division  
Hatch Act

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#### **Summary:**

If European corn borers begin developing resistance to Bt corn, which produces an insecticide toxic to this major corn pest, University of Nebraska entomologists are likely to spot it first. An Institute of Agriculture and Natural Resources scientist developed tests to detect changes in corn borers' susceptibility to Bt toxins. He uses it to annually check corn borer populations throughout U.S. corn-growing regions. He's seen no changes in the six years since Bt corn has been registered but he'll keep checking. His lab is responsible for assessing and keeping records on corn borer Bt susceptibility nationwide. The goal is to spot potential changes before resistance becomes widespread. The monitoring and early detection of potential susceptibility changes are vital to resistance management strategies designed to preserve Bt's effectiveness.

## **Competitive Agricultural Systems in a Global Economy**

### **Topic: Feedlot heat stress**

#### **Issue: (Who cares and why?)**

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

#### **What has been done?**

University of Nebraska animal scientists are collaborating with colleagues at Missouri, Purdue and USDA's Meat Animal Research Center on a three-year project to develop key management strategies feeders can use to reduce heat losses. This comprehensive study aims to better understand, predict, plan for and prevent heat stress. Researchers are combining feedlot and laboratory findings to develop management recommendations that focus on making cattle comfortable without sacrificing overall performance.

#### **Impact:**

This research is producing specific recommendations that will help feedlot operators keep hot spells from becoming deadly. In the past, severe heat literally forced some Nebraska feeders out of business when they couldn't recover financially from heavy cattle losses. Researchers are confident that implementing these strategies will keep cattle comfortable and minimize potentially devastating death losses. Adopting these strategies should reduce heat-related death losses by 50 percent to 100 percent; performance losses should be kept at a level where most cattle can comfortably compensate when heat dissipates.

#### **Funding:**

USDA National Research Initiative competitive grant  
Hatch Act  
NU Agricultural Research Division

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#### **Summary:**

Hot, still, humid days are potential killers in feedlots. During 1999's severe heat wave alone, cattle deaths and performance losses cost Nebraska producers more than \$20 million. A University of Nebraska animal scientist heads multi-state research that's developing management strategies feeders can use to keep severe heat from becoming deadly for cattle. They are developing specific recommendations for keeping cattle comfortable without sacrificing overall performance. Researchers are confident that implementing these strategies will minimize cattle discomfort and potentially devastating death losses.

## **Competitive Agricultural Systems in a Global Economy**

### **Topic: Economic benefits of wet byproduct feeds**

#### **Issue: (Who cares and why?)**

Nebraska's ethanol production capacity grew more than any other state's during the 1990s. This burgeoning ethanol and grain processing industry created markets for farmers' grain and jobs in rural communities. This expansion got a boost from University of Nebraska research that revealed wet ethanol processors' byproducts provide an economical cattle feed.

#### **What has been done?**

Research by Institute of Agriculture and Natural Resources animal scientists demonstrated the feasibility and benefits of feeding wet gluten feed, wet distillers grains and steep liquor to cattle directly instead of drying and shipping them to dried feed markets. Studies showed wet byproduct feeds' potential, performance and how to feed them. Researchers found wet byproducts were economical and performed as well as or better than corn in feedlot rations. Processors traditionally had dried byproducts at additional cost, but IANR scientists found drying reduced their nutritional value.

Researchers shared findings with grain processors and cattle producers. In less than a decade, wet byproducts went from unfamiliar material to a major Nebraska feed source. An IANR agricultural economist analyzed the economic benefits of this research by assessing the economic value of feeding processors' byproducts wet instead of dry.

#### **Impact:**

This research laid the foundation for a new, economical cattle feed source and helped reduce ethanol production costs. Feeding byproducts wet instead of drying them provided cumulative net economic benefits of \$212 million in Nebraska from 1992 through 1999. Processors received about 15 percent of this net benefit while feeders accrued the rest. Annual net economic benefits grew from \$1 million in 1992 to an average of \$42 million in recent years as new processing plants opened and more feedlots fed wet byproducts. Nebraska feedlots fed nearly 6 million tons (dry matter basis) of wet byproduct feeds from 1992 to 1999.

This research influenced processors' decisions to build plants in Nebraska designed to market wet byproducts. Only one of Nebraska's seven wet and dry milling plants now dries byproducts. The rest sell byproducts wet and most didn't build drying facilities.

#### **Funding:**

Ethanol and grain processing companies  
Nebraska Corn Board  
Nebraska Ethanol Authority  
NU Agricultural Research Division  
Hatch Act

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#### **Summary:**

Wet byproducts from Nebraska's expanding ethanol and grain processing industry have become a major cattle feed during the past decade, thanks partly to University of Nebraska research. Pioneering studies by Institute of Agriculture and Natural Resources animal scientists revealed the feasibility, benefits and economic advantages of feeding byproducts wet instead of drying and shipping them to dried feed markets. Feeding byproducts wet saves drying costs for processors and provides an economical cattle feed. An IANR agricultural economist's analysis showed this wet byproducts feed research is paying off handsomely for Nebraska. Feeding byproducts wet instead of drying them provided a \$212 million net cumulative economic benefit to Nebraska from 1992 through 1999.

## **Competitive Agricultural Systems in a Global Economy**

### **Topic: Wheat fertilization/end-use quality**

#### **Issue: (Who cares and why?)**

Hard red winter wheat end-use quality characteristics, such as protein content, are important to success in export markets. High protein wheat can bring premium prices for growers, yet little has been known about how nitrogen fertilizer influences protein levels and overall wheat quality.

#### **What has been done?**

University of Nebraska agronomists studied the effects of different nitrogen fertilizer levels on everything from yields to how the wheat performed in baking and milling. The five-year study was one of the most comprehensive ever focusing on fertilizer's impact from field to loaf. Scientists found that additional fertilizer boosted yields, grain protein and dough strength, and reduced mixing time — all positive results. An economic assessment is determining whether or when premium prices offset the added fertilizer costs.

#### **Impact:**

This research showed that producers can influence wheat quality factors important for export markets. IANR scientists are using these findings to develop specific fertility recommendations for Nebraska growers interested in producing high protein wheat. In the long-run this should help Nebraska growers be more competitive in the export market.

#### **Funding:**

NU Agricultural Research Division  
Hatch Act  
Nebraska Wheat Board

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#### **Summary:**

Applying additional fertilizer to dryland winter wheat boosts yields and improves quality characteristics important to the grain's end uses in baking and milling. Findings from this comprehensive University of Nebraska study should help Nebraska growers interested in producing high protein wheat, which can bring premium prices, especially in export markets. Researchers found that increasing nitrogen rates pushed up yields, grain protein content and dough strength, and reduced mixing time — all positive results. Institute of Agriculture and Natural Resources agronomists are using findings to develop specific recommendations for Nebraska wheat growers. They're also assessing if and when investing in additional fertilizer makes economic sense.

## **Competitive Agricultural Systems in a Global Economy**

### **Topic: Wheat yield gene research**

#### **Issue: (Who cares and why?)**

Yield is a pivotal crop trait but little is known about which genes influence yield and how they function. University of Nebraska agronomists are on the trail of some answers.

#### **What has been done?**

NU Institute of Agriculture and Natural Resources scientists are zeroing in on what they believe is a major gene responsible for yield in wheat. They've narrowed the gene's location to a small segment on the tip of one of wheat's 21 chromosome pairs and are using molecular biology techniques to pinpoint its exact location. Their findings suggest that this single gene is responsible for boosting wheat yields about 15 percent. These findings are particularly significant because yield is extremely complex and scientists long have thought it's unlikely that a single gene would have a major yield influence.

#### **Impact:**

This research has implications for both scientists and wheat farmers. Identifying a major gene controlling yield will allow scientists to decipher the genetic mechanisms responsible for this complex and economically important trait. The team aims to find and clone the gene and eventually incorporate it into NU's wheat breeding program to produce higher-yielding wheats for Nebraska growers.

#### **Funding:**

NU Agricultural Research Division  
Hatch Act  
USDA National Research Initiative competitive grant  
Nebraska Wheat Board

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#### **Summary:**

Yield is a pivotal crop trait, yet little is known about which genes influence yield and how they function. University of Nebraska agronomy researchers are tracking down some answers. These Institute of Agriculture and Natural Resources scientists are zeroing in on what they believe is a major gene responsible for yield in wheat. They've narrowed the gene's location to a small segment on the tip of one of wheat's 21 chromosome pairs and are using molecular biology tools to pinpoint its location. Their findings suggest this single gene is responsible for boosting wheat yields about 15 percent. Discovering a major gene controlling yield will allow scientists to decipher the genetic mechanisms responsible for this complex, economically important trait. Eventually, this gene and knowledge gained from this work could be incorporated into NU's wheat breeding program to produce higher-yielding wheats for growers.

## **Competitive Agricultural Systems in a Global Economy**

### **Topic: Beef muscle profiling**

#### **Issue: (Who cares and why?)**

A 1997 cattle industry report showed that the value of chuck and round had decreased more than 20 percent in recent years, a huge loss considering these cuts make up the majority of weight in a beef carcass. Findings of a University of Nebraska study could help turn this situation around and could lead to new products that benefit consumers and the beef industry.

#### **What has been done?**

NU Institute of Agriculture and Natural Resources meat scientists teamed with University of Florida colleagues to profile more than 5,500 muscles from the chuck and round in the largest study of its kind ever conducted. Findings show many muscles in the chuck and round are under-valued and could be put to better uses than butchers and chefs traditionally have given them. The team compiled its findings, which provide details needed to develop new products that add value to these cuts, on a CD-ROM that is available to industry and academia. Nebraska scientists now are studying marination with the chuck and round and developing innovative beef fabrication strategies to provide access to specific desirable muscles identified by the profiling.

#### **Impact:**

Industry has begun using this information and the findings have sparked interest from national retailers, who are testing ideas in key areas. The National Cattlemen's Beef Association hired a top-notch chef to develop recipes using some of the muscles the team identified. As a result, one of the largest beef distributors in the eastern United States began ordering these cuts.

#### **Funding:**

National Cattlemen's Beef Association  
NU Agricultural Research Division  
Hatch Act

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#### **Summary:**

University of Nebraska meat science analysis of more than 5,500 muscles from beef chuck and round cuts may lead to new value-added products that benefit consumers and beef producers. This study, the largest of its kind, showed that many muscles in the chuck and round, which often are ground for hamburger, could be put to higher value uses. Industry is using this information, and it has sparked interest from national retailers, who are testing ideas in key areas. The National Cattlemen's Beef Association hired a top-notch chef to develop recipes using some of the muscles the team identified and a major meat distributor now orders these cuts. The Institute of Agriculture and Natural Resources team compiled their results, which provide details for developing new products, on a CD-ROM available to industry and academia.



## **Competitive Agricultural Systems in a Global Economy**

### **Topic: Air-chilled poultry**

#### **Issue: (Who cares and why?)**

Chilling of poultry carcasses is a key step in processing that inhibits bacterial growth. MBA Poultry in Tecumseh, Neb., opened in 1998 as the nation's only federally inspected air-chilled poultry plant; all others in the U.S. use immersion chilling, in which birds get a cool-water bath. It's thought the risk of cross-contamination is greater with immersion chilling since broilers come into contact with each other. Immersion chilling also leads to water retention in the broilers, of concern to industry because emerging USDA labeling regulations would require processors to specify how much water their birds contain. University of Nebraska research has sought to determine differences between broilers processed with these two methods.

#### **What has been done?**

Institute of Agriculture and Natural Resources food and veterinary scientists have compared MBA's air-chilled broilers with those from an undisclosed immersion-chilling plant. Preliminary findings show both sets had roughly similar counts of non-disease-causing bacteria, but that the air-chilled broilers had less *Salmonella* and *Campylobacter*, bacteria that can cause illness. Air-chilled broilers also had significantly fewer psychrotrophs, bacteria that grow at refrigeration temperature and cause spoilage.

#### **Impact:**

These findings, while preliminary, indicate air-chilling may produce a broiler less susceptible to disease-causing bacteria, and one with a longer shelf life. The research also is helping a Nebraska business carve out a marketing niche. The research is part of a broader farm-to-table research and extension effort, including study of chicken farms over several growing seasons, aimed at taking safer chicken to market by pinpointing factors throughout the production process that influence safety. This research ultimately could yield new guidelines and recommendations for handling broilers.

#### **Funding:**

USDA  
NU Agricultural Research Division  
Hatch Act  
NU Cooperative Extension

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**Summary:**

Chilling poultry carcasses is a key step in processing that inhibits bacterial growth. MBA Poultry in Tecumseh, Neb., opened in 1998 as the nation's only federally inspected air-chilled poultry plant; all others use immersion chilling, in which the birds are given a cool-water bath. University of Nebraska scientists comparing broilers processed with these two methods have found that while both sets had roughly similar counts of non-disease-causing bacteria, the air-chilled broilers had less *Salmonella* and *Campylobacter*, bacteria that can cause illness. Air-chilled broilers also had significantly fewer psychrotrophs, bacteria that grow at refrigeration temperature and cause spoilage. This work is part of broader Institute of Agriculture and Natural Resources farm-to-table research aimed at taking safer chicken to market by pinpointing factors throughout the production process that influence safety. It ultimately could yield new guidelines and recommendations for handling broilers.

## **Competitive Agricultural Systems in a Global Economy**

### **Topic: Commercializing remote sensing**

#### **Issue: (Who cares and why?)**

Remote sensing and related technologies are powerful tools for assessing natural and human-made environments but have been too costly for private companies to pioneer.

#### **What has been done?**

The University of Nebraska's Center for Advanced Land Management Information Technologies collaborates with NASA on an economic development venture to develop commercial applications for remote sensing, global positioning systems, geographic information systems and related technologies for the Great Plains. The program works with companies to adapt these technologies to a specific application a participating company identifies. In one recent promising project, center staff evaluated the potential for remotely verifying tillage practices that store carbon in crop residue. This work was for a company that helps farmers sell carbon-storage credits to industry. Other recent successes involved remotely detecting nutrient deficiencies in corn in a genetics project and creating a digital map of agricultural ecology linked to a web-based tool to support crop choices.

#### **Impact:**

This program is developing practical commercial uses for spatial information technology and saving money for companies as they learn to use it. For example, verification of carbon-storing tillage practices is crucial to companies seeking to trade carbon credits. Using remote sensing to verify residue cover reduced costs 50 percent compared with doing so in person. Farming practices that reduce atmospheric carbon, which contributes to global warming, might provide participating farmers with 75 cents to \$1.25 per acre annually if they maintain at least 30 percent residue cover on crop ground. If 25 percent of the nation's farmers with such cover sold credits at \$1 per acre, it would generate about \$27 million annually in added income on those 109 million acres.

#### **Funding:**

NU Agricultural Research Division

NASA

NU Center for Advanced Land Management Information Technologies

Hatch Act

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**Summary:**

A collaboration between NASA and University of Nebraska researchers puts remote sensing and related technologies into the hands of private companies. Technology that otherwise would be too expensive for companies to develop is pioneered by NU's Center for Advanced Land Management Information Technologies in cooperation with private company partners. In one recent promising project, center staff evaluated the potential for remotely verifying tillage practices that store carbon in crop residue for a company that helps farmers sell carbon-storage credits to utilities and other companies. Remote sensing cuts verification costs in half compared with visiting the site for verification.

## **Competitive Agricultural Systems in a Global Economy**

### **Topic: Roundup Ready soybean yields**

#### **Issue: (Who cares and why?)**

Crops developed through biotechnology promise to simplify weed and insect pest management, but farmers need as much objective information as possible to determine whether these products are right for them.

#### **What has been done?**

University of Nebraska research helped answer farmers' questions about Roundup Ready soybean yields. Roundup Ready soybeans contain a gene that prevents damage from Roundup Ultra, the most popular non-selective, glyphosate-based herbicide. Roundup Ready soybeans simplify weed control, but two years of Institute of Agriculture and Natural Resources research at several Nebraska sites showed they yield somewhat less than conventional soybeans. In these studies, Roundup Ready soybeans yielded 5 percent to 10 percent less than conventional varieties. Researchers found that Roundup Ready soybeans' lower yields stem partly from the gene insertion process. The types of soybeans into which the gene was inserted accounted for the rest of the yield penalty.

#### **Impact:**

In these studies, Roundup Ready soybean yields averaged about three bushels per acre less than conventional soybeans, producing about 480 fewer bushels on 160 acres. The Roundup Ready system offers a simple, effective weed control that may be more profitable than conventional soybean systems if weeds can't be controlled using conventional means, researchers said. However, these findings provide objective information farmers can use to weigh their weed control options, consider tradeoffs and make better-informed decisions.

#### **Funding:**

NU Agricultural Research Division  
Hatch Act  
Nebraska Soybean Board

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#### **Summary:**

Crops developed through biotechnology promise to simplify weed and insect pest management, but farmers need as much information as possible to determine whether these products are right for them. Two years of University of Nebraska research on Roundup Ready soybean yields provided some answers to farmers' questions. Institute of Agriculture and Natural Resources studies found that Roundup Ready soybeans yield 5 percent to 10 percent less than conventional soybeans. The Roundup Ready system offers simple, effective weed control that may be more profitable than conventional soybean systems if weeds can't be controlled using conventional means. However, this research provides objective information farmers can use to weigh their weed control options, consider tradeoffs and make better-informed decisions.

## **Competitive Agricultural Systems in a Global Economy**

### **Topic: Wheat breeding payoffs**

#### **Issue: (Who cares and why?)**

To be competitive, Nebraska growers need wheat varieties that are top performers in milling and baking as well as in the field, yet few commercial seed companies breed wheat for this region.

#### **What has been done?**

University of Nebraska and USDA-Agricultural Research Service scientists based in Lincoln, Neb., collaborate on wheat research and breeding to develop improved varieties that are widely grown throughout Nebraska and beyond. NU's wheat breeding program focuses on improving both agronomic and end use characteristics. The result is higher-yielding varieties with the grain quality demanded by millers, bakers and, ultimately, consumers. In statewide variety trials, researchers compared three recent and widely grown NU varieties — Alliance, Arapahoe and Windstar — to Scout 66, the first great modern wheat variety from Nebraska, which was released in the 1960s and is a longtime industry standard. The three new NU varieties yielded 19 percent more than Scout.

#### **Impact:**

NU-developed hard red winter wheat varieties are planted on roughly three-fourths of Nebraska's wheat acres. These improved varieties have boosted Nebraska's annual yields by 12 million bushels since the 1960s. They're worth approximately \$31 million to \$37 million annually to Nebraska producers based on increased yield alone. These improvements are good for consumers, too. Nebraska wheat growers can feed nearly 5 million more Americans a year than they did on the same acreage in the 1960s.

#### **Funding:**

USDA-Agricultural Research Service  
Nebraska Wheat Board  
Hatch Act  
NU Agricultural Research Division

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#### **Summary:**

Varieties developed through the University of Nebraska's wheat breeding program provide Nebraska growers with improved wheats that perform well in the field and offer the quality characteristics millers and bakers demand. Nebraska-developed hard red winter wheat varieties are planted on roughly three-fourths of the state's wheat acres. These varieties have increased Nebraska's annual yields by 19 percent compared with the 1960s. These improved varieties are worth roughly \$31 million to \$37 million annually to Nebraska producers based on increased yield alone. Consumers benefit, too. Yield improvement in these varieties mean Nebraska wheat growers can feed nearly 5 million more Americans a year than they did on the same acreage in the 1960s.

## Safe and Secure Food and Fiber Systems

### Topic: *E. coli* genetic differences

#### Issue: (Who cares and why?)

Potentially deadly *E. coli* 0157:H7 bacteria is a major public health threat, but genetic differences among 0157:H7 populations and their role in causing disease aren't well-understood. Such understanding could yield more sensitive, accurate procedures for identifying disease-causing *E. coli* strains and could point to safer production practices, which would benefit both public health and the beef industry.

#### What has been done?

Food scientists at the University of Nebraska Institute of Agriculture and Natural Resources developed a new genetic fingerprinting method that is revealing surprising new information about *E. coli* 0157:H7. Their octamer-based genome scanning technique allows researchers to pinpoint genetic differences on *E. coli* DNA and to rapidly clone and identify the genes at those DNA sites.

Using this technique, they identified two distinct 0157:H7 populations in cattle: one that causes illness in people and one that appears to be less often successful at causing human illness.

Recent studies tracking these populations' global ancestry suggest the populations diverged some time ago and have since been spread globally. The Nebraska team now is in the midst of a two-year project to pinpoint all of the genetic differences between the populations.

#### Impact:

Discovery of genetically distinct *E. coli* 0157:H7 populations could explode theories about how people are exposed to 0157:H7 strains and the outcomes of those exposures. This research should provide genetic information to help trace the source of *E. coli*-related illnesses, increase understanding about how production practices influence different *E. coli* strains, could lead to a simpler, less expensive way to do large-scale *E. coli* testing and eventually help pin down each population's potential to cause human illness.

#### Funding:

Hatch Act

NU Agricultural Research Division

USDA National Research Initiative competitive grant

Nebraska Legislative Bill 1206

American Meat Institute

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#### Summary:

Using a new genetic fingerprinting method they developed, University of Nebraska food scientists discovered some surprising differences in populations of *E. coli* 0157:H7, the potentially deadly bacteria responsible for numerous ground beef recalls and food poisoning outbreaks. Initial results show that almost two-thirds of *E. coli* 0157:H7 isolates found in cattle appear to be incapable of causing illness in people. These findings and the scientists' powerful new tool should help more accurately trace the source of *E. coli*-related illness. This technique, called octamer-based genome scanning, eventually could help scientists develop simpler, less expensive tests to detect disease-causing *E. coli* 0157:H7 strains in large groups of cattle, such as those in feedlots.

## **Safe and Secure Food and Fiber Systems**

### **Topic: HACCP**

#### **Issue: (Who cares and why?)**

As the nation's leader in commercial livestock slaughter, Nebraska's economic well-being is closely tied to quality meat products. A single recall could drive a meat processor out of business, leaving employees jobless and a small town without a major employer.

#### **What has been done?**

University of Nebraska Cooperative Extension works with the meat and poultry industries on training to assure the quality and safety of Nebraska's meat products. During 2000, NU and Kansas State University extension specialists teamed to offer Good Manufacturing Process and Sanitation workshops in Nebraska, Kansas, South Dakota and Missouri to teach food processing company managers food safety concepts. NU also provides Hazard Analysis and Critical Control Points (HACCP) training to help processors meet federal safety standards by identifying critical production points where food contamination can occur and adopting improved product-handling controls. An NU-developed HACCP video, translated into four languages, is distributed to all very small USDA-inspected meat and poultry processors in the United States and Puerto Rico.

#### **Impact:**

In 2000, this training helped many Nebraska processors meet federal HACCP standards, assuring the quality and safety of meat products from local "mom and pop" processors. The program has helped many very small Nebraska processors meet these higher safety assurance levels rather than seeking an exemption, which is a national trend. The Nebraska-produced HACCP video, provided to more than 3,600 companies, saved each firm about \$1,000 for in-house training for line workers or \$100 to \$500 per employee for outside training.

#### **Funding:**

NU Cooperative Extension  
USDA CSREES  
Smith-Lever 3(b) and (c)  
Smith-Lever 3(d)  
User fees  
USDA Food Safety Quality Initiative

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#### **Summary:**

NU Cooperative Extension training is helping to ensure the quality and safety of meat products from local "mom and pop" processors in the Beef State. NU has helped many very small Nebraska processors meet higher federal food safety standards. During 2000, NU and Kansas State University extension specialists teamed to present sanitation workshops in Nebraska and three other states that teach food processing company managers food safety concepts. A Nebraska-produced video on federal procedures was provided to more than 3,600 companies including all very small USDA-inspected meat and poultry processors in the United States and Puerto Rico. This video saved each firm about \$1,000 for in-house training for line workers or \$100 to \$500 per employee for outside training.

## **Safe and Secure Food and Fiber Systems**

### **Topic: ServSafe**

#### **Issue: (Who cares and why?)**

Food-borne illness causes about 76 million illnesses, 325,000 hospitalizations and 5,000 deaths each year nationwide, according to the Centers for Disease Control and Prevention. Since Americans eat at least half of all meals away from home, assuring the safety of food served in restaurants, schools and nursing homes is important to everyone.

#### **What has been done?**

Since 1994, University of Nebraska Cooperative Extension has offered ServSafe training to an estimated 6,000 food service managers in Nebraska. Extension teams with the state departments of agriculture and health and human services, as well as the Nebraska Restaurant Association to offer the program statewide to teach participants safe food handling procedures. ServSafe's success prompted extension to coordinate new training for cooks and wait staff beginning in 1998. In one set of counties alone, 100 people representing full-service steakhouses to take-out pizza parlors took the training.

#### **Impact:**

Statewide, at least 95 percent of ServSafe participants pass a national certification test following training. Managers report increasing their knowledge of safe food handling techniques that can reduce the risk of foodborne illness by an estimated 33 percent. Managers report more conscientiousness about food temperature, cleaning and hand-washing. Each manager, in turn, is estimated to teach the food safety information to another 15 people, greatly extending extension's efforts.

#### **Funding:**

USDA Extension Service Food Safety Project  
Nebraska Restaurant Association  
NU Cooperative Extension  
Smith-Lever 3(b) and (c)  
Smith-Lever 3(d)  
User fees

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#### **Summary:**

Americans eat half of all meals away from home so assuring food safety in restaurants, schools and nursing homes is a big job. It's also the goal of NU Cooperative Extension's ServSafe program, conducted in cooperation with state agencies and the Nebraska Restaurant Association. About 6,000 restaurant managers have learned safe food handling procedures through the program since 1994. At least 95 percent of ServSafe participants pass a national certification test following training. Each trained manager, in turn, is estimated to teach food safety information to another 15 people, greatly extending extension's efforts.



## **Safe and Secure Food and Fiber System**

### **Topic: Food allergen tests**

#### **Issue: (Who cares and why?)**

For the roughly 5 percent of children and 1 percent to 2 percent of adults with food allergies, reading ingredient labels sometimes isn't enough to protect them from a serious allergic reaction. Traces of allergenic foods sometimes wind up where they shouldn't be through cross-contamination when manufacturers process foods on shared equipment. University of Nebraska food scientists have developed powerful new tests to help the food industry protect against potentially harmful cross-contamination.

#### **What has been done?**

NU Institute of Agriculture and Natural Resources food scientists devised fast, accurate tests that food processors can use in their plants to check for traces of peanut, egg and milk in processed foods and on equipment. These 30-minute tests replace procedures that took days to complete in a laboratory. These tests have been commercialized by Neogen Corp. of Michigan under a university license agreement.

#### **Impact:**

The NU-developed tests, which became commercially available to the food industry in the past three years, are the first to provide manufacturers with a quick, easy way to ensure equipment is free of any traces of peanut, egg or milk allergens. Other tests are in the research pipeline. Commercialization and industry adoption of these tests are helping protect allergic consumers.

#### **Funding:**

NU Agricultural Research Division  
NU Food Allergy Research and Resource  
Program member companies  
Hatch Act

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#### **Summary:**

Quick, accurate tests developed by University of Nebraska food scientists are helping the food industry protect people with food allergies. An Institute of Agriculture and Natural Resources team devised fast, accurate tests food processors can use in their plants to detect even minute traces of allergenic foods in processed foods or on equipment. Tests for egg, peanut and milk have been commercialized by a Michigan company that markets the tests to the food industry under a university license agreement. Tests for other food allergens to help protect allergic consumers are in the works.

**Issue: (Who cares and why?)**

Chilling of poultry carcasses is a key step in processing that inhibits bacterial growth. MBA Poultry in Tecumseh, Neb., opened in 1998 as the nation's only federally inspected air-chilled poultry plant; all others in the U.S. use immersion chilling, in which birds get a cool-water bath. It's thought the risk of cross-contamination is greater with immersion chilling since broilers come into contact with each other. Immersion chilling also leads to water retention in the broilers, of concern to industry because emerging USDA labeling regulations would require processors to specify how much water their birds contain. University of Nebraska research has sought to determine differences between broilers processed with these two methods.

**What has been done?**

Institute of Agriculture and Natural Resources food and veterinary scientists have compared MBA's air-chilled broilers with those from an undisclosed immersion-chilling plant. Preliminary findings show both sets had roughly similar counts of non-disease-causing bacteria, but that the air-chilled broilers had less *Salmonella* and *Campylobacter*, bacteria that can cause illness. Air-chilled broilers also had significantly fewer psychrotrophs, bacteria that grow at refrigeration temperature and cause spoilage.

**Impact:**

These findings, while preliminary, indicate air-chilling may produce a broiler less susceptible to disease-causing bacteria, and one with a longer shelf life. The research also is helping a Nebraska business carve out a marketing niche. The research is part of a broader farm-to-table research and extension effort, including study of chicken farms over several growing seasons, aimed at taking safer chicken to market by pinpointing factors throughout the production process that influence safety. This research ultimately could yield new guidelines and recommendations for handling broilers.

**Funding:**

USDA  
NU Agricultural Research Division  
Hatch Act  
NU Cooperative Extension

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**Summary:**

Chilling poultry carcasses is a key step in processing that inhibits bacterial growth. MBA Poultry in Tecumseh, Neb., opened in 1998 as the nation's only federally inspected air-chilled poultry plant; all others use immersion chilling, in which the birds are given a cool-water bath. University of Nebraska scientists comparing broilers processed with these two methods have found that while both sets had roughly similar counts of non-disease-causing bacteria, the air-chilled broilers had less *Salmonella* and *Campylobacter*, bacteria that can cause illness. Air-chilled broilers also had significantly fewer psychrotrophs, bacteria that grow at refrigeration temperature and cause spoilage. This work is part of broader Institute of Agriculture and Natural Resources farm-to-table research aimed at taking safer chicken to market by pinpointing factors throughout the production process that influence safety. It ultimately could yield new guidelines and recommendations for handling broilers.

## **Safe and Secure Food and Fiber Systems**

### **Topic: Food Processing Center**

#### **Issue: (Who cares and why?)**

Creating new jobs and diversifying economic opportunities are keys to maintaining Nebraska communities and quality of life. Entrepreneurs and established food processors get help adding value to the state's abundant livestock and grain from the University of Nebraska's Food Processing Center.

#### **What has been done?**

NU's Food Processing Center is a one-stop source of food safety, problem-solving, product development, and technical and business information for entrepreneurs and existing food processors. For example, its Nebraska Custom Processing Network matches Nebraska food processors that have excess plant capacity with companies that need custom or contract production, helping outside processors and Nebraska companies produce food more profitably. The center handles more than 3,000 inquiries annually for this program alone, which it operates in cooperation with the Nebraska Food Industry Association. The center was the first of its kind when it opened in 1983 and became a model for other universities.

#### **Impact:**

Nebraska's food processing industry has grown from 220 food processing businesses when the center opened to nearly 400 today. NU Food Processing Center officials estimate that the center's programs and services add an estimated \$12.5 million annually of economic value to Nebraska's economy. One company manager said the center's expertise helped the company increase sales by \$250,000, reduce operating costs by 7 percent, create 12 new jobs and invest \$100,000 in new capital projects. The center's Custom Processing Network has generated more than \$11 million of additional business for Nebraska processors and contributed to 11 plant expansions and four plant relocations to Nebraska.

#### **Funding:**

U.S. Department of Commerce  
USDA special appropriation  
Private sector funding  
NU Cooperative Extension  
NU Agricultural Research Division  
Hatch Act

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#### **Summary:**

The University of Nebraska's Food Processing Center offers technical and marketing/business development assistance to entrepreneurs and established food processing firms that has helped Nebraska's food processing industry grow from 220 food processing businesses when the center opened in 1983 to nearly 400 today. Center officials estimate its programs and services add about \$12.5 million of economic value to Nebraska's economy annually. One company manager said the center's expertise helped his company increase sales by \$250,000, reduce operating costs 7 percent, create 12 new jobs and invest \$100,000 in new capital projects.

## **Healthy, Well-Nourished Population**

### **Topic: City Sprouts**

#### **Issue: (Who cares and why?)**

Fruits and vegetables are cornerstones of a healthy diet. Yet a University of Nebraska Cooperative Extension survey found many minority residents of North Omaha, that city's poorest community, eat only one fresh fruit or vegetable daily, far fewer than the five servings recommended to reduce future disease risk. The reasons: lack of easy access to affordable, appealing produce and limited transportation to stores offering better produce selection.

#### **What has been done?**

NU extension teamed with other groups to help City Sprouts, a non-profit urban garden group, obtain a USDA grant to launch a farmer's market in North Omaha. Six markets in 2000 brought an array of fresh fruits and vegetables to the community and attracted about 200 people each. About 400 people attended a family food fun festival held during one market. NU extension staff provided nutrition information, recipes and samples that showed first-hand how to use fruits and vegetables to create healthy, tasty and culturally familiar foods such as collard and mustard greens, marinated tomatoes and green beans, salsa and sweet potato cookies. Interest in the market is growing. More than a dozen vendors are slated for markets in 2001 and 2002, where Food Stamps and Women, Infants and Children vouchers will be accepted.

#### **Impact:**

The markets' fruit and vegetable sales and residents' comments indicate produce consumption increased among market-goers. Even a seasonal increase in produce consumption should help decrease the community's risk of diet-related diseases. Several market-goers said they discovered healthier, lower-fat ways to prepare traditional foods. One market-goer said: "I thought you had to put meat in greens to make them taste good. Do you mind if I use this recipe in my barbecue catering business?" The markets also are credited with enhancing neighborhood pride and sense of community.

#### **Funding:**

City Sprouts  
Urban League of Nebraska Inc.  
Nebraska Sustainable Agriculture Society  
New Community Development Corp.  
NU Cooperative Extension  
U.S. Department of Agriculture

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**Summary:**

Fresh produce consumption among North Omaha residents has been lower than recommended for a healthy diet, partly because the community lacks easy access to affordable, appealing produce. To change this, University of Nebraska Cooperative Extension teamed with City Sprouts, a non-profit urban garden organization, and other groups to obtain a USDA grant to launch seasonal farmer's markets in the community that provide abundant, fresh produce. Extension provided nutrition information, recipes and samples to show residents how to use fruits and vegetables to create healthy, tasty and culturally familiar foods. Fruit and vegetable sales at the markets and market-goers' comments indicate produce consumption increased among participants. Even a seasonal increase in produce consumption should help decrease the community's risk of diet-related diseases. Several market-goers said they discovered healthier, lower-fat ways to prepare traditional foods.

## Healthy, Well-Nourished Population

### Topic: Gage County Immunization Clinic

#### **Issue: (Who cares and why?)**

Children who don't receive immunizations may suffer lifelong health problems and even death, but cost and accessibility can keep some families from getting timely childhood vaccinations. The Gage County Immunization Clinic helps assure that children in that area obtain the vaccinations that can be critical for good health.

#### **What has been done?**

Since 1970, University of Nebraska Cooperative Extension in Gage County has worked with the Beatrice Community Hospital and Health Center and Nebraska Health and Human Services to provide free immunization clinics to children ranging from newborns to age 19. The walk-in clinics, offered three times a month, are available to any family. Extension constituent groups in the county provide and train volunteers to help with registration and screening of children at each clinic. Volunteer nurses give the immunizations. Monthly immunization reports are sent to family physicians and the schools. The clinic has been recognized as a nationwide model for delivering immunizations to children.

#### **Impact:**

Since 1988, the immunization clinics have saved families \$1.7 million by giving 47,377 immunizations to 11,499 children. The average savings of \$101 per child is particularly significant because many family health insurance policies don't cover immunizations. In 2000, a special program targeting middle and high school youth in three communities resulted in an additional 579 immunizations valued at \$38,126. The clinic has become so well-known that only a few area doctors give immunizations in their offices. Most send their patients and their own children to the clinic.

#### **Funding:**

Nebraska Health and Human Services  
Beatrice Community Hospital and Health Center  
NU Cooperative Extension  
Donations and grants

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#### **Summary:**

Children who don't receive immunizations may suffer lifelong health problems and even death, but the cost and accessibility of vaccinations can keep some families from getting timely childhood vaccinations. Since 1970, University of Nebraska Cooperative Extension in Gage County has worked with the Beatrice Community Hospital and Health Center and Nebraska Health and Human Services to provide free immunization clinics. From 1988-2000, the clinic has saved families \$1.7 million by giving 47,377 immunizations to 11,499 children. The average savings of \$101 per child is significant because many family health insurance policies don't cover immunizations.

## **Healthy, Well-Nourished Population**

### **Topic: Nutrition Education Programs**

#### **Issue: (Who cares and why?)**

Refugee families and thousands of other low-resource Nebraskans are stretching their limited food dollars by learning smarter ways to budget and shop for nutritious food and to prepare a greater variety of foods. Participants say University of Nebraska Cooperative Extension nutrition programs help them improve their self-confidence as well as their nutrition.

#### **What has been done?**

Extension nutrition programs teach everything from good budgeting and meal planning to food safety and nutrition to help families become more self-sufficient. During 2000, extension nutrition programs served families from Bosnia, Russia, Vietnam, Turkey, Sudan and Iraq, as well as long-time Nebraskans. For the fiscal year ending Sept. 30, 2000, more than 7,300 families, 7,200 youth and 1,100 older adults participated in extension nutrition programs. Extension teams with federal programs such as the Women, Infants and Children program (WIC) and Head Start, the Nebraska Department of Health and Human Services, Employment First programs, local food pantries and food banks, family resource centers, public schools and faith-based social service organizations to offer nutrition programs that help low-resource Nebraskans. The state's program was one of three nationwide to receive a National Food Stamp Program/USDA Excellence in Nutrition Education Award in 2000.

#### **Impact:**

Nutrition program participants say these programs have helped their families eat healthier and better use their limited food budgets, and program facilitators report seeing other improvements in clients' lives. For example, a 30-year old father of three eagerly improved the basic cooking skills he learned from his late grandmother so he could prepare a family meal, such as a casserole. This former gang member also enrolled in parenting classes and expressed a desire to seek joint custody of his children.

#### **Funding:**

NU Cooperative Extension  
USDA Food and Nutrition Services  
Smith-Lever 3(d)

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#### **Summary:**

University of Nebraska Cooperative Extension nutrition programs reach a broad spectrum of Nebraska residents, from refugee families in Lincoln to long-time Nebraskans in rural areas. Extension helps low-resource clients improve how they budget, shop and what they eat, which boosts their self-sufficiency. In the fiscal year ending Sept. 30, 2000, over 7,300 families, 7,200 youth and 1,100 older adults participated in these programs. One client, a 30-year-old father of three, improved his cooking skills so he could prepare a family meal. This former gang member also enrolled in parenting classes and expressed a desire to seek joint custody of his children. The state's program was one of three nationwide to receive a National Food Stamp Program/USDA Excellence in Nutrition Education Award in 2000.



## **Healthy, Well-Nourished Population**

### **Topic: Head lice education**

#### **Issue: (Who cares and why?)**

Every year head lice infestations force children to miss school and parents to miss work while the condition is treated. For the 1998-99 school year, Lincoln Public Schools, one of Nebraska's largest school districts, reported more than 6,700 cases of head lice. Of those, 2,500 were re-infestations, indicating that not all treatments were effective. Parents and school officials became frustrated when treatments failed and the condition spread.

#### **What has been done?**

University of Nebraska Cooperative Extension teamed with Lincoln Public Schools, the Nebraska Department of Health and Human Services and the Lincoln/Lancaster County Health Department to provide education to health care and school professionals and the public on effective head lice treatments. Working as a part of the Lincoln Public Schools Head Lice Task Force, extension developed easy-to-understand fact sheets, a short video and a Powerpoint presentation covering all aspects of head lice management. The materials were distributed locally, regionally and nationally through presentations to public health personnel, school nurses, social workers, childcare providers, elementary school principals, physicians and nurses. In turn, these people educate colleagues and the public. In Lincoln, fact sheets are sent home with elementary school children. One was translated into Spanish. The video has aired on Lincoln, Fremont and Scottsbluff cable access channels and Nebraska Educable, and other states have purchased them for use in their educational programs. The video and other materials also are available on the Internet.

#### **Impact:**

As a result of this educational effort, Lincoln Public Schools changed its head lice policies. LPS adopted a "no nit" policy that prohibits children from attending school if they have live lice or nits in their hair, thus reducing the spread of the problem. LPS nurses now screen students the first week of school and after winter break and recommend only products labeled for head lice control. One year after instituting these changes, LPS reported a 70 percent reduction in head lice cases. Lincoln/Lancaster County Health Department saw nearly 60 percent fewer cases reported, and public health nurses made 60 percent fewer home visits. More than 800 videos have been sold in Nebraska and nearly 200 to 28 other states and one to England. The head lice web site receives more than 5,000 hits monthly.

#### **Funding:**

NU Cooperative Extension  
Nebraska Department of Health and Human Services  
UNL Department of Entomology  
Lincoln Public Schools  
Videotape sales

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**Summary:**

Every year head lice infestations force children to miss school and parents to miss work while the condition is treated. If an ineffective treatment is used, the problem persists. University of Nebraska Cooperative Extension in Lancaster County teamed with Lincoln Public Schools, the Nebraska Department of Health and Human Services and the Lincoln/Lancaster County Health Department to provide education on effective head lice treatments. In 2000, just one year after implementing changes based on this effort, Lincoln Public Schools reported a 70 percent decrease in head lice cases. The Lincoln/Lancaster County Health Department had nearly 60 percent fewer cases reported, and public health nurses made 60 percent fewer home visits.

## **Healthy, Well-Nourished Population**

### **Topic: BRIDGES Inc. community coalition**

#### **Issue: (Who cares and why?)**

As with many small communities, funding is tight for all sorts of human services in Seward County, Nebraska. When county officials noticed that local youth, family and health service organizations were duplicating efforts, they sought ways to reduce duplication, increase communications and foster closer working relationships among organizations to put existing and future funds to the best use.

#### **What has been done?**

University of Nebraska Cooperative Extension in Seward County helped organize and coordinates BRIDGES Inc., a non-profit grassroots coalition created in 1997 to connect and coordinate county services with a goal of improving the lives of families and youth. The coalition formed task forces to address alcohol, tobacco and drug abuse prevention and other issues important to the county. BRIDGES helped create programs for youth and families, including reading, mentoring, drug prevention, advocate and economic improvement. Extension programs such as Character Counts and 4-H projects are integrated into some programs. In three years, BRIDGES has introduced 15 community programs and recruited more than 400 volunteers who serve as educators, mentors and advocates for the families and youth who participate in programs.

#### **Impact:**

Seward County youth and families can more easily find and access programs offered by schools, civic organizations, government and businesses, thanks to BRIDGES. Over two years, this coordinated effort to identify and provide programs addressing key needs has generated \$142,000 in grants and \$105,000 of in-kind money, which now fund 75 percent of the programs. A local school principal said the coordination is paying off: "At last all the schools are working together so now we can use each other's resources to get more for our money and time."

Individual programs are showing positive effects for participants. For example, teachers estimate communication skills improved 25 percent among youth in the Adventures in Mentoring program. The mother of one of these participants said: "I can't thank you enough for getting my daughter a mentor. Her self-esteem has totally changed. Please let her have a mentor next year."

#### **Funding:**

Smith Lever 3(b) & (c)  
NU Cooperative Extension (in kind)  
Community grants  
Contributing community organizations

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**Summary:**

Youth and families in Seward County are more easily able to find and access programs offered by schools, civic organizations, businesses and government agencies, thanks to BRIDGES Inc., a non-profit grassroots coalition. University of Nebraska Cooperative Extension in Seward County coordinates this effort to provide youth, family and health-related services. Since its formation in 1997, BRIDGES has introduced 15 programs and recruited more than 400 volunteers who serve as educators, mentors and advocates for the families and youth who participate in the programs. In two years, this coordinated effort to identify and provide programs addressing key needs generated \$142,000 in grants and \$105,000 of in-kind money, which now fund 75 percent of the programs. A local school principal said the coordination is paying off: "At last all the schools are working together so now we can use each other's resources to get more for our money and time."

## Healthy, Well-Nourished Population

### Topic: Exercise dependency index

#### **Issue: (Who cares and why?)**

Most everyone knows regular exercise is a key part of a healthy lifestyle. What's less well known is that it's possible to get too much of a good thing. Some people exercise excessively and become so dependent on workouts that they risk damaging their health, personal relationships and careers.

#### **What has been done?**

University of Nebraska nutrition scientists developed the 30-question Exercise Habits Inventory that helps analyze a person's exercise regimen. Results provide clues to one's risk for developing exercise dependence. The test is being piloted as a screening tool for physicians and consulting dietitians to assess peoples' exercise habits and their risk for developing exercise dependence.

#### **Impact:**

Early detection of exercise dependence may help health professionals address this potentially addictive behavior in both men and women and detect eating disorders. If successful, the pilot test could become a national model leading to earlier detection and treatment of exercise addiction and eating disorders.

#### **Funding:**

NU Agricultural Research Division  
Hatch Act  
NU College of Human Resources and Family Sciences

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#### **Summary:**

Regular exercise is healthy, but too much of a good thing can signal potentially serious problems, such as eating disorders. University of Nebraska nutrition scientists have developed a test to help health professionals analyze a person's exercise regimen and assess their risk for developing exercise dependence. Early detection of excessive exercise habits may help control this potentially addictive behavior in both men and women and detect eating disorders earlier. The NU-developed test is being piloted as a screening tool for physicians and consulting dietitians. If successful, the test could become a national model.

## **Healthy, Well-Nourished Population**

### **Topic: Omega Eggs**

#### **Issue: (Who cares and why?)**

Omega-3 fatty acids can help reduce some heart disease risk factors, but many Americans don't get enough of these beneficial nutrients. A University of Nebraska scientist hopes her research helps change this situation.

#### **What's been done?**

This NU Institute of Agriculture and Natural Resources researcher developed an entire poultry management system for economically producing eggs rich in omega-3 fatty acids. Flax seed, a significant source of omega-3 fatty acid, is a key feed ingredient in her patented Omega Egg production system. The system provides good nutrition for hens, produces a consistent product and addresses food safety needs.

Each Omega Egg produced using the NU system contains 350 milligrams of omega-3 fatty acids compared with 40 milligrams in conventional eggs. They're also lower in cholesterol. NU research show that eating up to two Omega Eggs can reduce blood serum triglyceride levels 14 percent. High triglyceride levels are one risk factor for heart disease. Omega-3 fatty acids also have been shown to increase the ratio of good to bad cholesterol and reduce the occurrence of blood clots, another heart disease risk factor.

#### **Impact:**

The patented NU system makes Omega Egg production more economical and efficient. That should lead to increased availability of the heart-healthy eggs for consumers. Commercial production of Omega Eggs using the NU system began in early 2001 under a university agreement with a Midwestern grocery store supplier. The supplier distributes Omega Eggs to a major supermarket chain in seven Plains and Midwest states, making them commercially available to consumers.

#### **Funding:**

NU Agricultural Research Division  
Hatch Act  
U.S. Flax Institute  
North Dakota Oil Seed Council

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#### **Summary:**

Omega-3 fatty acids help reduce heart disease risk factors, but many Americans don't get enough of these beneficial nutrients. A University of Nebraska poultry scientist's research makes it more economical to produce eggs rich in these beneficial fatty acids. That, in turn, could make them more widely available to consumers. She developed a complete management system that egg producers can use to efficiently produce Omega Eggs. The university patented her production system and has licensed it. One licensee is supplying Omega Eggs to a major grocery chain in Nebraska and six other states.

## **Healthy, Well-Nourished Population**

### **Topic: Smoking and diet**

#### **Issue: (Who cares and why?)**

Traditionally, health campaigns have urged Americans to kick one chronic bad habit — such as drinking, smoking or poor nutrition — at a time. New University of Nebraska research may turn that thinking on its ear and build a case for attacking multiple bad habits at the same time.

#### **What has been done?**

University of Nebraska nutritionists examined health habit diaries of nearly 7,000 American adults and found people with one of these bad health habits tend to have them all because the habits reinforce each other. For example, compared with non-smokers, smokers tend to eat fewer foods rich in protective antioxidants, eat more high-fat foods and drink more alcohol. Previous studies identified smokers' lower antioxidant levels. The NU research confirmed those findings and was the first to link these lower antioxidant levels to diet.

#### **Impact:**

The Nebraska research provides insight about why traditional quit-one-habit-at-a-time approaches often miss the mark: These behaviors are so interconnected that people have trouble kicking one habit while continuing the others. These findings and followup studies exploring why these bad habit clusters tend to form could lead to more successful health campaigns that target multiple bad habits.

#### **Funding:**

NU Agricultural Research Division  
Hatch Act  
NU College of Human Resources and Family Sciences

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#### **Summary:**

Traditionally, health campaigns have urged Americans to kick one chronic bad habit — such as drinking, smoking, or poor nutrition — at a time. New University of Nebraska research may turn that conventional wisdom on its ear. The Institute of Agriculture and Natural Resources study of nearly 7,000 American adults found drinking, smoking and poor nutrition reinforce each other. People with one of these bad health habits tend to have them all. That increases health risks considerably and boosts associated social and health care costs. These College of Human Resources and Family Sciences' findings could lead to new, more successful health campaigns that target quitting multiple bad habits at the same time.

## **Greater Harmony Between Agriculture and the Environment**

### **Topic: Ranch Practicum**

#### **Issue: (Who cares and why?)**

Cattle are big business in Nebraska, which ranks second nationally in cattle and calf production. Wise ranch management is critical to improving the profitability and sustainability of the Beef State's cow-calf producers.

#### **What has been done?**

University of Nebraska Cooperative Extension's Ranch Practicum offers ranchers hands-on experience in integrated management, which incorporates their operation's cattle, forage and economic resources. Participants include ranchers, veterinarians, nutritionists, conservationists and educators from Nebraska and other states, who enroll in the practicum taught by NU extension educators and specialists from June to January. They spend two days in a classroom in North Platte and five days performing field laboratory activities at NU's Gudmundsen Sandhills Laboratory near Whitman. At home, they practice solving real-life problems such as calculating stocking rates for pastures.

#### **Impact:**

Participating producers estimate the practicum's average value at \$28 per head in their own herds, or about \$21,000 average benefit for each participant based on an average cow herd of 751 head. More than 90 percent of participants surveyed said they expect their profitability to increase thanks to this training; more than 80 percent said it will improve their operation's sustainability.

#### **Funding:**

NU Cooperative Extension  
Financial institutions  
User fees

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#### **Summary:**

University of Nebraska Cooperative Extension's Nebraska Ranch Practicum teaches ranchers an integrated systems management approach that incorporates animal, forage and economic components. Sessions taught by extension educators and specialists run from June to January with two days in a classroom and five days performing field laboratory activities. At home, participants practice solving real-life problems such as calculating stocking rates for pastures. The first practicum in 1999 attracted 28 participants from Nebraska and other states. Participants estimate the knowledge gained is worth \$28 per head or an average of \$21,028 per participating rancher. More than 80 percent of participants surveyed said the practicum will improve their operation's sustainability.



## Greater Harmony Between Agriculture and the Environment

### Topic: Cleaning sandpit lakes

#### Issue: (Who cares and why?)

From fishing to water skiing, sandpit lakes are popular recreation spots in much of Nebraska. Uncontrolled algae growth can clog these lakes with a bluish-green scum, contribute to fish kills and make them unsafe, foul-smelling and unusable for recreation. University of Nebraska water quality researchers have developed a nontoxic way to control algae and restore lake water quality.

#### What has been done?

NU Institute of Agriculture and Natural Resources scientists discovered that treating groundwater-fed sandpit lakes with nontoxic aluminum sulfate greatly reduces blue-green algae growth by reducing high phosphorous levels that contaminate many sandpit lakes. Phosphorous, a plant nutrient, is the algae's main food source. Aluminum sulfate binds with phosphorus, carries it to the bottom and forms a barrier that eliminates phosphorus as a food source for algae.

Research shows aluminum sulfate is nontoxic to fish and other aquatic organisms. The traditional treatment, copper sulfate, can kill fish and other aquatic organisms along with algae, but doesn't reduce a lake's nutrients and often must be repeated several times annually. Though aluminum sulfate initially costs more than copper sulfide, one application can equal up to five to seven copper sulfate treatments.

#### Impact:

This NU-developed technique offers an effective and more environmentally sound way to control common algae in sandpit lakes. Applied properly, aluminum sulfate prevents nearly 97 percent of all phosphorus from entering a lake from bottom sediments. After treatment, water clarity can increase by more than 130 percent while algae growth decreases by about 65 percent. The technique has been used to clean several Nebraska sandpit lakes, including one at the Fremont State Lake Recreation Area, a popular recreation spot.

#### Funding:

NU Agricultural Research Division  
Hatch Act  
UNL Water Center  
U.S. Environmental Protection Agency  
U.S. Geological Survey  
Nebraska Department of Environmental Quality  
NEBCO

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#### Summary:

Excessive algae growth can ruin sandpit lakes for recreation, contribute to fish kills and leave them unattractive and foul-smelling. University of Nebraska researchers have developed a non-toxic aluminum sulfate treatment that reduces algae growth by nearly two-thirds. The solution binds with phosphorous, a key nutrient for algae, pulls it to the lake bottom and forms a barrier against more nutrients coming into the lake. The process is easy to apply and doesn't kill fish or other organisms. While it's initially more expensive, it can be as effective as five to seven conventional copper sulfide treatments, which can be toxic to lake organisms.

## **Greater Harmony Between Agriculture and the Environment**

### **Topic: Riparian strip assessment**

#### **Issue: (Who cares and why?)**

Runoff from farm fields can carry chemicals and sediments that pollute streams, rivers and lakes. Strips of vegetation planted between fields and surface water are commonly used to protect water quality by slowing runoff and containing contaminants. However, there's no simple, practical way to evaluate their performance under real-world conditions.

#### **What has been done?**

Existing filter or buffer strip assessment techniques are expensive and labor-intensive, and are used mostly on small research plots under controlled conditions. University of Nebraska researchers are developing simple, inexpensive in-field devices to measure water flow into and out of buffers. They've tested several of their designs and are refining the most promising techniques. The idea is to create sampling systems that catch a small fraction of the runoff flowing into, through and out of the buffers, near a stream. By collecting and testing samples, researchers can determine by how much the buffer strip is reducing contaminants reaching the stream. Ultimately, this research will provide a simple tool for researchers and natural resource managers to check filter strips' effectiveness.

#### **Impact:**

USDA's Conservation Filter Strip Initiative to publicly fund 2 million miles of new buffer strips nationwide by 2002 is the latest in federal, state and local efforts to expand use of these strips to protect water quality. The simple tool the Nebraska team is developing will enable researchers and others to more accurately assess buffer strips' design and construction to make them as efficient as possible under Great Plains' cropping conditions.

#### **Funding:**

NU Agricultural Research Division interdisciplinary grant  
Hatch Act  
Nebraska Corn Board

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**Summary:**

Riparian buffer strips, strips of vegetation planted between farm fields and streams and lakes, are widely used to protect water quality by keeping sediments and chemicals from contaminating the water. While the strips are promising, there's been no simple, low-cost way to measure their effectiveness in the field. University of Nebraska researchers are devising a simple technique for evaluating filter strips' effectiveness under real-world conditions. Eventually, this Institute of Agriculture and Natural Resources research will provide an easy-to-use technique to more accurately assess buffer strips' design and construction to make them as efficient as possible under Great Plains' cropping conditions.

## **Greater Harmony Between Agriculture and the Environment**

### **Topic: Commercializing remote sensing**

#### **Issue: (Who cares and why?)**

Remote sensing and related technologies are powerful tools for assessing natural and human-made environments but have been too costly for private companies to pioneer.

#### **What has been done?**

The University of Nebraska's Center for Advanced Land Management Information Technologies collaborates with NASA on an economic development venture to develop commercial applications for remote sensing, global positioning systems, geographic information systems and related technologies for the Great Plains. The program works with companies to adapt these technologies to a specific application a participating company identifies. In one recent promising project, center staff evaluated the potential for remotely verifying tillage practices that store carbon in crop residue. This work was for a company that helps farmers sell carbon-storage credits to industry. Other recent successes involved remotely detecting nutrient deficiencies in corn in a genetics project and creating a digital map of agricultural ecology linked to a web-based tool to support crop choices.

#### **Impact:**

This program is developing practical commercial uses for spatial information technology and saving money for companies as they learn to use it. For example, verification of carbon-storing tillage practices is crucial to companies seeking to trade carbon credits. Using remote sensing to verify residue cover reduced costs 50 percent compared with doing so in person. Farming practices that reduce atmospheric carbon, which contributes to global warming, might provide participating farmers with 75 cents to \$1.25 per acre annually if they maintain at least 30 percent residue cover on crop ground. If 25 percent of the nation's farmers with such cover sold credits at \$1 per acre, it would generate about \$27 million annually in added income on those 109 million acres.

#### **Funding:**

NU Agricultural Research Division

NASA

NU Center for Advanced Land Management Information Technologies

Hatch Act

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**Summary:**

A collaboration between NASA and University of Nebraska researchers puts remote sensing and related technologies into the hands of private companies. Technology that otherwise would be too expensive for companies to develop is pioneered by NU's Center for Advanced Land Management Information Technologies in cooperation with private company partners. In one recent promising project, center staff evaluated the potential for remotely verifying tillage practices that store carbon in crop residue for a company that helps farmers sell carbon-storage credits to utilities and other companies. Remote sensing cuts verification costs in half compared with visiting the site for verification.

## **Greater Harmony Between Agriculture and the Environment**

### **Topic: Wells database on the web**

#### **Issue: (Who cares and why?)**

Nebraska has collected a wealth of information about water wells over the years that is vital to regulators, well drillers and others. But even the best information isn't helpful unless it's easily accessible.

#### **What has been done?**

A joint effort by the University of Nebraska's Conservation and Survey Division and the Nebraska Department of Natural Resources has created an easily searchable Internet database that contains a variety of information about Nebraska's 115,000 registered water wells. Well information includes location, owner, county, sediment size by depth, static and pumping water levels, well-completion data and acres irrigated. This effort paid off in 2000 when this information, which constitutes the state's largest geologic database, became electronically available to all Nebraskans. The information is available on the DNR's web site.

#### **Impact:**

Providing an easily accessible, web-based database saves time for state personnel who once had to search, copy and mail paper files to fill requests. Information now is immediately available to well drillers, regulators and consultants. It's estimated that Nebraska's 350 well drillers could save a total of \$280,000 annually by directly accessing the database. The Nebraska Department of Environmental Quality and the Department of Natural Resources estimate the database will save about \$46,000 annually in personnel costs. In the long run, the public will benefit when wells or landfills are sited, pollution is cleaned up or prevented, water supplies are supplemented or stream-aquifer interaction is analyzed.

#### **Funding:**

Nebraska State Records Board  
Nebraska Information Technology Commission  
Nebraska Department of Natural Resources  
Conservation and Survey Division  
School of Natural Resource Sciences

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#### **Summary:**

Well drillers, consultants and the public can easily access information about Nebraska's 115,000 registered water wells, thanks to a joint effort by the University of Nebraska's Conservation and Survey Division and the Nebraska Department of Natural Resources. This project turned file cabinets full of paper documents into an easily searchable electronic database accessible via the World Wide Web. This successful effort to put Nebraska's largest geographic database on the Internet is saving time for state agencies, well drillers, consultants and others who rely on this information to do their jobs. This wealth of information about the state's water wells is available on the DNR's web site. It's estimated that having this information readily accessible on the web should save \$326,000 annually for well drillers and state agencies alone.

## Greater Harmony Between Agriculture and the Environment

### Topic: Cleaning up pesticide-contaminated soil

#### Issue: (Who cares and why?)

Pesticides help farmers grow abundant crops, but chemical spills can contaminate soil and ground-water, threaten the environment and cost millions to clean up. University of Nebraska scientists devised a simple, low-tech and low-cost way to clean up soil contaminated with pesticides.

#### What has been done?

Their simple method involves mixing iron and water into pesticide-contaminated soil. Iron is the key. It shows the potential to quickly, effectively attenuate a variety of pesticides. The NU Institute of Agriculture and Natural Resources technique involves windrowing soil with earth-moving equipment and mixing it with a high-speed soil mixing and fracturing implement. Iron particles and water are added during mixing. Windrows are covered with plastic sheeting and kept moist for three months. This technique eliminates up to 95 percent of the contamination, allowing once-toxic soil to be returned to the ground. This approach is adaptable to many contamination situations, uses readily available material and equipment and can be easily taught to almost anyone.

#### Impact:

This method is up to 95 percent effective in removing pesticide contamination from soil. Researchers believe more pesticide spills may be reported if business owners know simple, economical and environmentally safe cleanup methods are available. Using iron to treat contaminated soil can cost as little as \$30 per cubic yard, compared with more than \$600 per yard with current cleanup methods that usually involve removing, transporting and incinerating soil. During successful field tests, researchers helped a southwest Nebraska company decontaminate soil from an herbicide spill five years earlier. Cleanup using the NU technique cost \$62,500, compared with a potential cost of more than \$604,000 had the soil been transported and incinerated.

#### Funding:

NU Agricultural Research Division  
Hatch Act  
U.S. Geological Survey water resources research grant  
UNL Water Center

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#### Summary:

Current soil decontamination techniques can cost millions of dollars. Institute of Agriculture and Natural Resources researchers have developed a simple cleanup technique that involves mixing iron particles and water into pesticide-contaminated soil. This method shows potential to quickly and cost-effectively clean up a variety of pesticides and allow once-toxic soil to be returned to the ground. This technique uses readily available materials and equipment, and the methods can be easily taught to almost anyone. Using iron to decontaminate soil can cost as little as \$30 per cubic yard, compared with more than \$600 per yard for current methods that usually involve removing, transporting and incinerating soil. During successful field tests, researchers helped a southwest Nebraska company decontaminate soil from an herbicide spill five years earlier. Cleanup using the NU technique cost \$62,500, compared with a potential cost of more than \$604,000 had the soil been transported and incinerated.

## **Economic Development and Quality of Life for People and Communities**

### **Topic: Master Navigator**

#### **Issue: (Who cares and why?)**

Business success today depends on keeping up with technology. Without the ability to electronically make transactions, many businesses could get left behind and lose working relationships and customers. A web presence for businesses practically is a must to retain and recruit customers, yet only 28 percent of Nebraska rural business use the Internet as a tool.

#### **What has been done?**

Master Navigator is a community Internet training program designed to build local information technology expertise in rural communities. In this University of Nebraska Cooperative Extension program participants learn about Internet technologies and agree to spend time teaching others to build community web pages or other activities that promote Internet use. Navigator participants can follow up with extension's Electronic Main Street program, which teaches more specifics on marketing and promoting electronic businesses.

#### **Impact:**

Since 1999 nearly 500 Nebraskans have completed the Master Navigator course and each agreed to pass their knowledge on to others. Whole communities can benefit. In Seward County, for example, government, education and business teamed to post all 140 community businesses to the web, which has directly resulted in additional business contacts. Individuals also benefit. One 78-year-old who hadn't touched a computer before the course went on to teach others how to buy stocks and make investments via the web.

#### **Funding:**

NU Cooperative Extension  
Nebraska Information Technology Commission grant

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#### **Summary:**

Conducting business over the Internet is a fact of life if businesses are to remain or become viable in today's entrepreneurial climate. Yet only 28 percent of Nebraska's rural businesses use e-commerce as a tool. Since 1999, University of Nebraska Cooperative Extension's Master Navigator has taught nearly 500 people the basics of Internet use. Those individuals agreed to pass their knowledge on to others. Participants can follow up with the more in-depth Electronic Main Street, which teaches more specifics on marketing and promoting electronic business. Both communities and individuals benefit. In Seward County, for example, government, education and business teamed to post all 140 community businesses to the web, which has directly resulted in additional business contacts. Individuals also benefit. One 78-year-old who hadn't touched a computer before the course went on to teach others how to buy stocks and make investments via the web.



## **Economic Development and Quality of Life for People and Communities**

### **Topic: Food Entrepreneur Assistance Program**

#### **Issue: (Who cares and why?)**

Launching a new food product line takes more than an innovative idea. Entrepreneurs may lack the resources or expertise to package, label, price or choose a processor to produce a safe, marketable food product — all ingredients for success.

#### **What has been done?**

The Food Entrepreneur Assistance Program in the University of Nebraska's Food Processing Center trains and helps people trying to start or expand a food business by offering technical and marketing/business development assistance to entrepreneurs. From packaging and pricing to product development and promotion, the program helps entrepreneurs determine the specific needs of their prospective business.

#### **Impact:**

Food Processing Center staff estimate the Food Entrepreneur Assistance Program saves participating entrepreneurs about \$20,000 in food business startup costs. Since the program began in 1989, it has helped 101 companies start, and 73 percent remain in business, a high percentage for this competitive industry. Many participants say they couldn't have succeeded without the training. An Omaha-based company that makes salad dressings benefitted from the program's marketing assistance and achieved statewide product distribution within its first few years.

#### **Funding:**

U.S. Department of Commerce  
USDA CSREES special appropriation  
Private sector funding  
NU Cooperative Extension

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#### **Summary:**

Entrepreneurs may have a great idea but lack the resources and expertise to launch a safe, marketable food product or expand their food business. The Food Entrepreneur Assistance Program of the University of Nebraska's Food Processing Center offers technical and marketing/business development assistance that saves participating business owners about \$20,000 in startup costs. Since the program began in 1989, it has helped 101 companies start, and 73 percent remain in business, a high percentage for this competitive industry.

## **Economic Development and Quality of Life for People and Communities**

### **Topic: EDGE**

#### **Issue: (Who cares and why?)**

Adequate job opportunities are essential to small town survival and growth. Some rural Nebraskans are creating their own jobs and businesses with help from a University of Nebraska Cooperative Extension program.

#### **What has been done?**

Nebraska EDGE — Enhancing, Developing and Growing Entrepreneurs — is an umbrella organization for rural entrepreneurial training programs hosted by local communities, organizations and associations. Entrepreneurs teach EDGE courses for business owners looking to expand and potential business owners. Participants learn legal structures, market strategies, financial statements, book-keeping, cash flow, financing and how to manage growth. Extension works with community sponsors and course instructors to provide the EDGE program. In 2000, EDGE added alternative agricultural product training to its course offerings.

#### **Impact:**

Nearly 900 existing and potential Nebraska business owners have participated in EDGE since it began in 1993. About half of those participants started or expanded their businesses, creating more than 500 new jobs, mostly in rural communities. One recent EDGE participant said he learned the importance of budgeting and projecting cash flow, which "... kept us from closing our doors." Another said the training provided a whole new outlook on managing growth.

#### **Funding:**

NU Cooperative Extension  
QWEST Foundation  
Nebraska Microenterprise Partnership Fund  
Nebraska Department of Economic Development  
USDA Sustainable Agriculture Research and Education  
Local community coalition support

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#### **Summary:**

Creating jobs is key to growing and sustaining Nebraska's small communities. A University of Nebraska Cooperative Extension program helps rural and small-town residents start or expand small businesses. The Nebraska EDGE — Enhancing, Developing and Growing Entrepreneurs — training courses are taught by entrepreneurs for entrepreneurs. Since EDGE began in 1993, nearly 900 existing and potential Nebraska business owners have participated. About half of them started or expanded their businesses, creating more than 500 new jobs, mostly in rural communities. One recent EDGE participant said he learned the importance of budgeting and projecting cash flow, which "... kept us from closing our doors." Another said the training gave him a whole new outlook on managing growth.

## **Economic Development and Quality of Life for People and Communities**

### **Topic: City Sprouts**

#### **Issue: (Who cares and why?)**

Fruits and vegetables are cornerstones of a healthy diet. Yet a University of Nebraska Cooperative Extension survey found many minority residents of North Omaha, that city's poorest community, eat only one fresh fruit or vegetable daily, far fewer than the five servings recommended to reduce future disease risk. The reasons: lacks easy access to affordable, appealing produce and limited transportation to stores offering better produce selection.

#### **What has been done?**

NU extension teamed with other groups to help City Sprouts, a non-profit urban garden group, obtain a USDA grant to launch a farmers market in North Omaha. Six markets in 2000 brought an array of fresh fruits and vegetables to the community and attracted about 200 people each. About 400 people attended a family food fun festival held during one market. NU extension staff provided nutrition information, recipes and samples that showed first-hand how to use fruits and vegetables to create healthy, tasty and culturally familiar foods such as collard and mustard greens, marinated tomatoes and green beans, salsa and sweet potato cookies. Interest in the market is growing. More than a dozen vendors are slated for markets in 2001 and 2002, where Food Stamps and Women, Infants and Children vouchers will be accepted.

#### **Impact:**

The markets' fruit and vegetable sales and residents' comments indicate produce consumption increased among market-goers. Even a seasonal increase in produce consumption should help decrease the community's risk of diet-related diseases. Several market-goers said they discovered healthier, lower-fat ways to prepare traditional foods. One market-goer said: "I thought you had to put meat in greens to make them taste good. Do you mind if I use this recipe in my barbecue catering business?" The markets also are credited with enhancing neighborhood pride and sense of community.

#### **Funding:**

City Sprouts  
Urban League of Nebraska Inc.  
Nebraska Sustainable Agriculture Society  
New Community Development Corp.  
NU Cooperative Extension  
U.S. Department of Agriculture

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#### **Summary:**

Fresh produce consumption among North Omaha residents has been lower than recommended for a healthy diet, partly because the community lacks easy access to affordable, appealing produce. To change this, University of Nebraska Cooperative Extension teamed with City Sprouts, a non-profit urban garden organization, and other groups to obtain a USDA grant to launch seasonal farmer's markets in the community that provide abundant, fresh produce. Extension provided nutrition information, recipes and samples to show residents how to use fruits and vegetables to create healthy, tasty and culturally familiar foods. Fruit and vegetable sales at the markets and market-goers' comments indicate produce consumption increased among participants. Even a seasonal increase in produce consumption should help decrease the community's risk of diet-related diseases. Several market-goers said they discovered healthier, lower-fat ways to prepare traditional foods.

## **Economic Development and Quality of Life for People and Communities**

### **Topic: Women in Agricultural Marketing**

#### **Issue: (Who cares and why?)**

While they're sometimes silent partners on farms and ranches, women often make key marketing and financial decisions. A University of Nebraska program gives women the knowledge to better market their operation's crops and livestock.

#### **What has been done?**

NU Cooperative Extension's Women in Agricultural Marketing curriculum helps farm and ranch women learn marketing. The four two-day sessions are conducted throughout the year and follow the marketing cycle: pre-planting, spring rally and pre- and post-harvest. This helps participants retain concepts and put them to work. From learning how to assess their production costs to judging how to best time grain or cattle sales for maximum payoffs, participants learn ways to increase the bottom line. Since 1994, approximately 300 women have participated in the program.

#### **Impact:**

Fifteen southeastern Nebraska women who participated in Women in Agricultural Marketing curriculum formed a marketing group called GRAIN Gals, short for Gals Reaping Agricultural Information in Nebraska. Members gather monthly to share marketing strategies and decision-driving information. GRAIN Gals members and other participants in the ag marketing curriculum credit the program with making their farm businesses more profitable. One Nebraska woman said she learned how to forward contract and used this knowledge to pre-price her corn at 50 cents a bushel above the market price in 2000. Another reported she now can earn more as a full-time farm partner focusing on marketing than by taking a job in town.

#### **Funding:**

NU Cooperative Extension  
Smith-Lever 3(b) & (c)  
Smith-Lever 3(d)  
United Nebraska Bank  
User fees

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#### **Summary:**

Some of the most productive farm decisions in Nebraska aren't made in fields, but around kitchen tables. Participants in the University of Nebraska Cooperative Extension's Women in Agricultural Marketing workshops learn how to better market their farm or ranch's commodities. The four two-day sessions, offered throughout the year, give women time to retain concepts and put them to work at home. One participant credits the program with teaching her how to forward contract, which she used to sell corn at 50 cents a bushel above the market price in 2000. Another reported she can earn more as a full-time farm partner focusing on marketing than by taking a job in town. Others report the program has a ripple effect that has led them to become more involved in other farm and ranch management decisions and in their communities.

## **Economic Development and Quality of Life for People and Communities**

### **Topic: Building Nebraska Families**

#### **Issue: (Who cares and why?)**

The transition from welfare to work means more than getting a job. It means building self-sufficiency through money management and, often, improving everything from communications and parenting skills to nutrition and time management.

#### **What has been done?**

The University of Nebraska's Building Nebraska Families is an intensive program that teaches life skills to people struggling to move from welfare to work. This program reaches out to people facing multiple obstacles to success, such as debt, low self-esteem, anger problems and little sense of responsibility for improving their lives. Extension collaborated with the Nebraska Health and Human Services System to develop this program in 1999. In 1999-2000, five extension educators enrolled 65 people in the program and the program expanded from nine to 23 counties. This is an intensive education program in which staff work one-on-one with participants to teach family management and life skills. Participants have an average of three or four children; all families live at or below 130 percent of the poverty level and receive some public assistance.

#### **Impact:**

Of the nine people who graduated in the program's first year, six got jobs by year's end. The other three went on to school. Participants say the program helped them learn skills they need to find and hold a job, have a place to live, start paying down their bills, own up to past mistakes and feel better about themselves. One graduate landed a job she likes and is working to pay off her bills. She was amazed that — thanks to what she'd learned — she still had money in her pocket and food in the house five days before payday. Another participant with a poor work history due to a hot temper learned how to manage his anger and cope with criticism; he now has a better job.

#### **Funding:**

Nebraska Health and Human Services System  
NU Cooperative Extension  
Smith-Lever 3 (b) & (c)

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#### **Summary:**

Transitioning from welfare to work means more than getting a job. University of Nebraska Cooperative Extension's Building Nebraska Families program helps build a range of basic life skills, from money management and parenting to nutrition, time management and personal responsibility among people struggling to move from welfare to work. Extension collaborated with the Nebraska Health and Human Services System to create the program in 1999. In its first year, the program had 65 enrollees, nine of whom graduated from the intensive program in which educators work one-on-one with participants. Six graduates got jobs and three went on to school. One client got a job she liked and was working to pay her bills off. She was amazed that — thanks to what she learned in the program — she still had money in her pocket and food in the house five days before payday.

## **Economic Development and Quality of Life for People and Communities**

### **Topic: Character Counts!**

#### **Issue (Who cares and why?)**

Character development is critical for fostering children's overall sense of well-being, recent studies show. A University of Nebraska Cooperative Extension program helps children sort right from wrong and encourages them to use universally accepted values to strengthen their character.

#### **What has been done?**

Since 1996, the Character Counts! program through Nebraska 4-H has reached 128,000 kids with activities in schools, day camps, child care, civic groups, 4-H and other organizations. The national program, developed by the Josephson Institute of Ethics, teaches six pillars of character: trustworthiness, respect, responsibility, fairness, caring and citizenship. Age-appropriate activities make these abstract concepts understandable. About 1,900 Nebraska youth and adults have been trained to teach Character Counts! and more than 31,000 youth have been involved in Character Counts! programming in their school classrooms. In 2000, an NU-sponsored conference, "Creating a Community of Character," drew more than 900 people, including community and state government leaders. Ten other states now use Nebraska's Character Counts! materials.

#### **Impact:**

Nearly half of all Nebraskans have participated in one or more Character Counts! events since 1996, when the program began in Nebraska. Teachers and parents say Character Counts! has improved children's behavior and language. In a statewide survey, 85 percent of the teachers using Character Counts! reported an overall positive difference in the children they teach. They reported a 61 percent increase in children helping each other; a 55 percent decrease in students blaming others; and a 50 percent increase in students' truthfulness. One principal said fewer children in his school require discipline and that students who do visit his office are taking responsibility for their actions.

Seventy-five percent of the teachers surveyed also said they changed their own behavior as a result of teaching Character Counts! Ninety-three percent of extension staff surveyed said they were more likely to stress the importance of character in their programs, and 85 percent said they would be more likely to advocate ethical decision making with their friends and families.

#### **Funding:**

NU Cooperative Extension  
Smith-Lever 3(d)  
Organization and civic group donations

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#### **Summary:**

For children, character development is critical to foster an overall sense of well-being. Character Counts!, a University of Nebraska Cooperative Extension 4-H program, teaches universally accepted values and a common language. In a statewide survey, 85 percent of the teachers using Character Counts! reported an overall positive difference in the children they teach. Teachers and facilitators also reported changing their own behavior as a result of the training. Nearly half of all Nebraskans have participated in some Character Counts! event since 1996, when the program began in Nebraska.

## **Economic Development and Quality of Life for People and Communities**

### **Topic: Food Processing Center**

#### **Issue: (Who cares and why?)**

Creating new jobs and diversifying economic opportunities are keys to maintaining Nebraska communities and quality of life. Entrepreneurs and established food processors get help adding value to the state's abundant livestock and grain from the University of Nebraska's Food Processing Center.

#### **What has been done?**

NU's Food Processing Center is a one-stop source of food safety, problem-solving, product development, and technical and business information for entrepreneurs and existing food processors. For example, its Nebraska Custom Processing Network matches Nebraska food processors that have excess plant capacity with companies that need custom or contract production, helping outside processors and Nebraska companies produce food more profitably. The center handles more than 3,000 inquiries annually for this program alone, which it operates in cooperation with the Nebraska Food Industry Association. The center was the first of its kind when it opened in 1983 and became a model for other universities.

#### **Impact:**

Nebraska's food processing industry has grown from 220 food processing businesses when the center opened to nearly 400 today. NU Food Processing Center officials estimate that the center's programs and services add an estimated \$12.5 million annually of economic value to Nebraska's economy. One company manager said the center's expertise helped the company increase sales by \$250,000, reduce operating costs by 7 percent, create 12 new jobs and invest \$100,000 in new capital projects. The center's Custom Processing Network has generated more than \$11 million of additional business for Nebraska processors and contributed to 11 plant expansions and four plant relocations to Nebraska.

#### **Funding:**

U.S. Department of Commerce  
USDA special appropriation  
Private sector funding  
NU Cooperative Extension  
NU Agricultural Research Division  
Hatch Act

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#### **Summary:**

The University of Nebraska's Food Processing Center offers technical and marketing/business development assistance to entrepreneurs and established food processing firms that has helped Nebraska's food processing industry grow from 220 food processing businesses when the center opened in 1983 to nearly 400 today. Center officials estimate its programs and services add about \$12.5 million of economic value to Nebraska's economy annually. One company manager said the center's expertise helped his company increase sales by \$250,000, reduce operating costs 7 percent, create 12 new jobs and invest \$100,000 in new capital projects.



## **Economic Development and Quality of Life for People and Communities**

### **Topic: Drought Monitor**

#### **Issue: (Who cares and why?)**

Drought plagues at least 10 percent to 18 percent of the nation annually, costing \$6 billion to \$8 billion. While it is the costliest natural disaster, drought's slow, creeping nature makes it hard to predict and monitor, which is important for reducing its catastrophic effects.

#### **What has been done?**

University of Nebraska researchers at the National Drought Mitigation Center helped develop and now maintain a new nationwide drought tracking system, called the Drought Monitor. Launched in August 1999, this web-based monitor combines several drought and water indices in a single, simple, colorful map showing where drought is emerging, lingering or subsiding nationwide. Frequent updates highlight emerging trouble spots so state and federal officials can take steps to reduce drought's impacts. NU Institute of Agriculture and Natural Resources researchers collaborated with USDA and the National Oceanic and Atmospheric Administration on this project, which is the first to consolidate scientific data from numerous sources into a single, simple format.

#### **Impact:**

The Drought Monitor fills a nationwide need for timely, user-friendly information to improve drought tracking and to characterize its severity. It's estimated that more than a million people used the monitor in its first year. Major media nationwide, including The Weather Channel, use the monitor in some form. While it was primarily designed for drought and water planners, the monitor's wide use and simple format are increasing public awareness of drought. Alabama, Florida, Georgia, Oklahoma, Nebraska and South Carolina are among numerous states using the Drought Monitor in some form to better monitor, plan and respond to drought.

#### **Funding:**

USDA  
National Drought Mitigation Center  
NU Agricultural Research Division  
Hatch Act

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#### **Summary:**

A new drought tracking system that University of Nebraska researchers helped develop is improving drought monitoring nationwide. Institute of Agriculture and Natural Resources scientists at the NU-based National Drought Mitigation Center teamed with scientists at two federal agencies to develop the Drought Monitor, an easily understood, web-based tool for tracking widespread drought. The monitor combines information from several drought and water indices in a single map showing where drought is emerging, lingering and subsiding. It highlights emerging trouble spots so state and federal agencies can work to reduce drought's impacts. It's estimated that more than a million people used the monitor in 1999, its first year. State and federal agencies use the monitor in their drought planning and response efforts.



## **Society-Ready Graduates**

### **Topic: Pollution Prevention Internship**

#### **Issue: (Who cares and why?)**

Industrial waste and pollution are costly to industry, but many manufacturers, especially small businesses, may lack the expertise to reduce, reuse and recycle in their operations. A University of Nebraska internship program provides businesses with pollution prevention expertise and gives students real-world engineering experience.

#### **What has been done?**

Through the Partners in Pollution Prevention Internship, engineering students work with manufacturers and small businesses to identify ways to reduce waste and pollution, and conserve energy. Since the program began in 1997, undergraduate interns have worked with 223 Nebraska businesses, including 34 in 2000 alone. Businesses receive confidential written reports outlining recommendations, cost/benefit estimates and other information about how to reduce waste. Students get practical experience, a paycheck and college credit. Headed by an NU biological systems engineer, the internship is a joint effort of the university, the U.S. Environmental Protection Agency Region 7, the Nebraska Department of Environmental Quality and the Nebraska Energy Office.

#### **Impact:**

About 1,220 Nebraskans were introduced to pollution prevention concepts in 2000 alone by undergraduate pollution prevention interns. Reports in 2000 indicate the 34 participating businesses could save roughly \$1.68 million, divert 9.12 million pounds of solid waste annually from landfills, reduce about 7,500 gallons of hazardous waste annually and save 970,000 kilowatts of electricity annually by implementing interns' recommendations. Each year, the cost-effectiveness of the interns' recommendations has increased, bringing the cumulative four-year total value of recommendations to nearly \$5 million. Interns say they've significantly increased their understanding of pollution prevention and ability to communicate with business people, and will use pollution prevention concepts in class and on the job.

#### **Funding:**

NU Cooperative Extension  
NU College of Engineering and Technology  
NU Department of Biological Systems Engineering  
NU Department of Civil Engineering  
NU Water Center/Environmental Programs  
U.S. Environmental Protection Agency Region VII  
Nebraska Department of Environmental Quality  
NU Center for Infrastructure Research  
Smith-Lever 3(b) and (c)  
Nebraska Energy Office

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**Summary:**

University of Nebraska students are providing money-saving pollution prevention expertise to businesses while gaining real-world engineering experience. During 2000, the Partners in Pollution Prevention Internship program produced recommendations that could save the year's 34 participating Nebraska businesses roughly \$1.68 million, divert 9.12 million pounds of solid waste annually from landfills, reduce about 7,500 gallons of hazardous waste annually and save 970,000 kilowatts of electricity annually, if implemented. The cumulative four-year total value of interns' recommendations approaches \$5 million. Students get practical experience, a paycheck and college credit.

## **Society-Ready Graduates**

### **Topic: Nebraska Beef Team**

#### **Issue: (Who cares and why?)**

These days, many shoppers don't know how to select and cook beef cuts. As a result, they may buy less beef or purchase only well-known cuts, such as steaks.

#### **What has been done?**

To help consumers learn about beef while they're shopping, the University of Nebraska joined with the state's beef industry in 1998 to establish the Nebraska Beef Team, the first of its kind in the nation. Each year, a team of 10 to 15 College of Agricultural Sciences and Natural Resources students is trained to educate customers about beef in the grocery store. Team members set up information booths near meat counters, where they answer questions, explain uses for different beef cuts, suggest money-saving tips and offer recipes, cooking, food safety and nutrition information. During its first two years, the team distributed more than 60,000 recipes. The team is a joint effort of NU's Institute of Agriculture and Natural Resources, the Nebraska Beef Council, several county cattlemen's affiliates and Harry Knobbe, a West Point, Neb., beef producer who conceived the idea.

#### **Impact:**

Consumers give the program high marks. They report that students gave them the information and confidence needed to select and successfully prepare new beef cuts. Students say the team provides first-hand experience in communications and consumer education. A former team member says the communications skills he developed helped him land a good job after graduation. The program has become a national model and sparked nationwide beef industry interest. By early 2001, the team organizers had trained people in Arizona, Georgia, Kentucky, Mississippi, Ohio and Tennessee to create similar programs.

#### **Funding:**

Nebraska Beef Council  
Harry Knobbe, West Point cattle feeder

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#### **Summary:**

The Nebraska Beef Team is helping Lincoln consumers learn how to better use beef in their menus by providing information right at the supermarket meat counter. The team of University of Nebraska-Lincoln College of Agricultural Sciences and Natural Resources students is trained to educate shoppers about beef selection, cooking, nutrition and food safety. The team, a partnership between the state's beef industry and NU's Institute of Agriculture and Natural Resources, was the first of its kind when it began in 1998. It's a national model and team organizers have trained people to establish similar programs in several other states. The program is a hit with consumers who say they're prepared to try new beef cuts and dishes thanks to the team's help. Students learn first-hand the communications skills they'll use in job interviews and their careers. One credits his experience with building the communication skills to land a good job after graduation.

## **Society-Ready Graduates**

### **Topic: ACE**

#### **Issue: (Who cares and why?)**

Finding solid academic and social niches in a large university is key to staying in school, earning good grades, getting involved in campus activities and graduating. This is especially true for students leaving small, familiar towns for a big-city campus miles away.

#### **What has been done?**

University of Nebraska-Lincoln housing officials worked with the College of Agricultural Sciences and Natural Resources and the College of Human Resources and Family Sciences to develop a program that helps first-year students in these colleges live, learn and grow together during the challenging first year of college. Since 1997, the Achievement, Commitment and Excellence (ACE) program has housed some first-year students in one dorm on UNL's East Campus where they are surrounded by other first-year students with similar interests. They have access to support services such as tutoring and advising, upper class mentors and dinners with faculty. Students take a leadership and personal development class to help them become leaders on campus and in their communities following graduation. ACE had 53 students during the 1999-2000 school year.

#### **Impact:**

Ninety-three percent of ACE participants who were first-year students in spring 1999 returned as sophomores in fall 2000, compared with a campuswide retention rate of 81 percent during the same period.

#### **Funding:**

University of Nebraska-Lincoln Office of Housing  
Student fees  
NU College of Agricultural Sciences and Natural Resources

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#### **Summary:**

For students leaving small towns for a big-city campus, finding solid academic and social niches is key to staying in school, earning good grades, participating in campus activities and graduating. University of Nebraska-Lincoln housing officials and the College of Agricultural Sciences and Natural Resources and the College of Human Resources and Family Sciences offer the Achievement, Commitment and Excellence (ACE) program to help first-year students succeed academically and socially so they stay in school. The program houses first-year students with similar interests together, provides tutoring and other support services and teaches students to become campus and community leaders. This effort led to retaining 93 percent of ACE participants from spring 1999 to fall 2000. Campuswide, the retention rate for the same period was 81 percent.

## **Society-Ready Graduates**

### **Topic: International Quilt Studies Center**

#### **Issue: (Who cares and why?)**

Textiles, particularly quilts, are records of human achievement, cultural heritage and history. Antique quilts have become among the most sought-after of the nation's folk arts. Conserving surviving quilts and the stories behind the women and men who made them helps to preserve that social history.

#### **What has been done?**

In 1997, Ardis and Robert James gave the University of Nebraska-Lincoln their one-of-a-kind collection of quilts dating from the late 1700s to modern times and an endowment that led to creating a state-of-the-art storage facility for NU's International Quilt Studies Center. The center encourages interdisciplinary study of all aspects of quilt-making traditions and fosters preservation of these traditions by conserving and exhibiting quilts. NU is believed to be the only U.S. educational institution offering graduate study in textile history and textile design with an emphasis in quilt studies. Two other major donations — the Robert and Helen Cargo collection of African-American quilts and the Sara Miller Amish crib quilt collection — give students access to the nation's largest public collection of nearly 1,200 quilts.

#### **Impact:**

The NU College of Human Resources and Family Sciences' master's degree program in textile history with an emphasis in quilt studies began in 1997. It attracts students to study with some of the world's foremost authorities on American quilts and is enhancing the university's reputation in the field. Research through the International Quilt Studies Center is advancing the understanding of American history, including the changing role of women and the impact of the Industrial Revolution on textiles and textile production. The center has launched an ambitious five-year exhibition schedule, showcasing both traditional and contemporary quilts; selected exhibitions are traveling worldwide.

#### **Funding:**

NU College of Human Resources and Family Sciences  
Robert and Ardis James Foundation  
National Endowment for the Humanities  
Nebraska State Quilt Guild  
University of Nebraska Foundation

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#### **Summary:**

The University of Nebraska-Lincoln is home to a one-of-a-kind quilt collection that captures America's cultural heritage and history. NU's International Quilt Studies Center boasts three major donated collections, covering quilts from the 1700s to contemporary times, including collections of African-American and Amish crib quilts. The center provides students and others access to the nation's largest public collection of nearly 1,200 quilts. The center is attracting students to the College of Human Resources and Family Sciences' unique graduate program in textile history and textile design with an emphasis in quilt studies.

## **Society-Ready Graduates**

### **Topic: BSE hands-on course**

#### **Issue: (Who cares and why?)**

Students who can solve practical, real-world problems have a leg up in the competitive worlds of graduate school and the job market. A University of Nebraska biological systems engineering program aims to produce such in-demand graduates.

#### **What has been done?**

In the early 1990s, NU faculty developed an engineering curriculum that encourages students to hone their design skills and find practical solutions to problems throughout their college careers. Biological Systems Engineering, a department in NU's Institute of Agriculture and Natural Resources, solicits clients who need senior engineering students to solve real-world problems. The projects encourage invention, innovation and entrepreneurship.

In 1999, a team of three NU biological systems engineering students redesigned the Dingman Mouth Gag, a device that helps surgeons correct the birth defect cleft palate by holding a patient's mouth open during surgery. After analyzing the device and observing a cleft palate operation, the students designed a prototype of the device. An NU research and development lab manager built the prototype, which was used by a local plastic surgeon, modified and used again.

#### **Impact:**

The surgeon said the redesigned device is more stable and adjustable, which allows him to work more efficiently during surgery. The students all began their careers with good jobs in their fields.

#### **Funding:**

NU College of Agriculture and Natural Resources  
NU Industrial Agricultural Products Center  
Lemelson Foundation, Amherst, Mass.

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#### **Summary:**

Students who can solve practical, real-world problems have an advantage in graduate school and the job market. University of Nebraska biological systems engineering students tackle clients' problems in a program that encourages invention, innovation and entrepreneurship. In 1999, a team of three students redesigned a device that helps surgeons correct the birth defect cleft palate by holding a patient's mouth open during surgery. After the students' modifications, a local plastic surgeon credits the more stable and adjustable redesigned device with allowing him to work more efficiently during surgery. The students credit the class with helping them find good jobs to start their careers.

## **Society-Ready Graduates**

### **Topic: Consumer economics class**

#### **Issue: (Who cares and why?)**

To succeed financially, college graduates need the skills and knowledge they gain in their major and minor subjects plus practical understanding of information about consumer economics and finance.

#### **What has been done?**

After many University of Nebraska College of Agricultural Sciences and Natural Resources students indicated they knew little about personal and consumer finance matters, the college piloted a new consumer economics and finance class, primarily for juniors and seniors, in 2000. The course emphasizes information important to agricultural college students. The class points students to Internet resources they can use to address problems relevant to their financial circumstances, including self-employment issues common among agriculture graduates such as buying adequate health and life insurance for a small business.

#### **Impact:**

Students say they are much better prepared to handle personal and consumer finances after completing the course. Several students recommended that the class be mandatory for all students. The class also expanded students' knowledge of web resources available to help resolve consumer finance issues in the future.

#### **Funding:**

NU College of Agricultural Sciences and Natural Resources

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#### **Summary:**

When University of Nebraska College of Agricultural Sciences and Natural Resources students graduate, many return to their family business or start agricultural careers on their own knowing little about personal finances, from buying a vehicle to investing money for long-term goals. In 2000, the college piloted a new consumer economics and finance class for upper-level students that addresses these consumer and personal finances as well as self-employment issues common among agriculture graduates, such as buying adequate insurance for a small business. Students say they're much better equipped to handle personal financial matters, thanks to the class, and expect this information will help them after graduation.

## **Society-Ready Graduates**

### **Topic: Grazing livestock systems major**

#### **Issue: (Who cares and why?)**

Grasses, grazing and forage are the foundation of the nation's beef cattle industry with forages providing more than 70 percent of beef cattle's feed needs. To help meet beef industry needs for people well-versed in this important part of the cattle business, the University of Nebraska's College of Agricultural Sciences and Natural Resources recently launched a new major.

#### **What has been done?**

In 1999, NU introduced a hands-on, interdisciplinary major in grazing livestock systems to meet students' needs. This NU College of Agricultural Sciences and Natural Resources major draws from agronomy, animal science and agricultural economics, with advice from grazing livestock industry professionals. Students get the chance to explore grazing systems up close during required 12-week internships, which range from working on ranches or farms to working with state or federal agencies or commodity groups. A video, web site and quarterly newsletter will promote the major.

#### **Impact:**

The first of the 11 current grazing livestock systems majors will graduate in May 2001. Some students are planning dual majors in agribusiness or animal science. One student said the multi-disciplinary program is giving her a well-rounded education that will make her more marketable when she graduates. All of these graduates will enter the workforce or graduate school with the skills and practical experience the grazing and cattle industry demands.

#### **Funding:**

NU College of Agricultural Sciences and Natural Resources  
U.S. Department of Agriculture  
Center for Grassland Studies  
Department of Agricultural Economics  
Department of Agronomy and Horticulture  
Department of Animal Science

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#### **Summary:**

Forages provide more than 70 percent of beef cattle's feed nationally, so grazing and forage systems are cornerstones of the cattle industry. To help meet beef industry needs for people well-versed in the key part of the cattle business, the University of Nebraska's College of Agricultural Sciences and Natural Resources in 1999 launched a hands-on, interdisciplinary major in grazing livestock systems to prepare students for careers in this field. This major draws from agronomy, animal science and agricultural economics, with advice from grazing livestock industry professionals. Students get first-hand experience during 12-week internships that focus on grazing issues. The first of 11 grazing livestock systems majors will graduate in May 2001, ready to enter the workforce or graduate school with practical experience the industry demands.





