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IMPACT 2000

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. 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 for IANR programs. These impacts are not a comprehensive listing of IANR accomplishments, but highlight some of our 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 2000 database is expected to be open for public use later this spring.

Competitive Agricultural Systems in a Global Economy

Topic: Diagnostic Clinics

Issue: (Who cares and why?)

Agricultural production is becoming more sophisticated with new technologies to master and increasingly complex weed, disease and pest control decisions. Staying abreast of these issues is important to survival for farmers, crop consultants and other ag business professionals, especially when profits margins are slim.

What has been done?

For years, University of Nebraska Cooperative Extension has provided low-cost, hands-on training to maximize profits through applied on-farm research, marketing groups, educational programs and enterprise record analyses. For example, two-day, hands-on crop management workshops were first offered in Nebraska's Panhandle to ag professionals to improve their crop diagnostic and management skills. The interdisciplinary training program included weed, insect, disease, irrigation, fertility, equipment and general crop production management. Different crops are selected for focus each year and include sugar beets, dry beans, corn and winter wheat. The most recent session focused on sugar beets and drew nearly 100 participants from six states and Canada. When necessary, other university specialists have been invited to compliment the team-delivered programs.

In eastern Nebraska, extension offers summer field diagnostic clinics and winter workshops for crop consultants, producers and agribusiness professionals. These sessions provide in-depth training on integrated pest management, soil fertility, crop production, irrigation, technology and management issues. In 1999 alone, nearly 380 ag professionals from 62 Nebraska counties and eight other states attended the crop management and diagnostic clinics. Nearly 250 people from 54 Nebraska counties and five other states attended the Integrated Crop Management Winter Programs.

Impact:

Pre- and post-workshop testing showed Panhandle session participants increased their knowledge 103 percent as a result of the sugar beet sessions. The Panhandle workshop has affected 200,000 acres of sugar beets in four states. Participants estimate the value of knowledge gained at \$45 per acre, for a total value of more than \$7 million, based on the number of acres participants manage. More than 90 percent apply the workshop information to their operations.

The 377 participants in the eastern Nebraska Crop Management and Diagnostic Clinics were responsible for 4 million crop acres, nearly a quarter of Nebraska's total crop acres. 1999 participants estimated the clinic's value at nearly \$11 per acre, or more than \$43 million total. Participants in the winter crop management programs influenced crop management decisions on nearly 3 million crop acres, or 22 percent of Nebraska's row crop acres. They estimated the value of knowledge gained at about \$7 per acre or more than \$20 million total.

Funding:

User fees

Private industries

University of Nebraska Cooperative Extension

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Summary:

Agricultural production is becoming more sophisticated with new technologies to master and increasingly complex weed, disease and pest control decisions. University of Nebraska Cooperative Extension diagnostic clinics help farmers, crop consultants and other ag business professionals stay abreast of these changes. University of Nebraska Cooperative Extension teams with three other states to offer the sugar beet crop management workshop in western Nebraska. Participants estimate value of knowledge gained at this session at \$45 per acre, or about \$7 million based on the 200,000 acres affected. In eastern Nebraska, nearly 380 agribusiness professionals participated in the 1999 summer field diagnostic clinics. Participants estimated the clinics' value at \$11 per acre or more than \$43 million total on the 4 million acres they manage. That represents nearly a quarter of Nebraska's crop acres.

Competitive Agricultural Systems in a Global Economy

Topic: Beef Home Study Courses

Issue: (Who cares and why?)

Nebraska is second nationally in cattle and calf production. To stay competitive cattle producers need the latest information on beef nutrition, health care, market and industry trends, research and reproduction. University of Nebraska Cooperative Extension brings education home with courses producers can take on their own schedules.

What has been done?

"Beef Cow Basics," a series of home-study courses taught from the rancher perspective, offers money-saving information to novices as well as fourth-generation producers. More than 4,500 courses have been distributed to producers in more than 40 states, plus Bosnia, Mexico and Brazil, since 1993. Course offerings are fine-tuned based on participant feedback; business and personnel management was added recently and an advanced herd nutrition course is being piloted.

The Nebraska home study course has the potential to take off in new directions — and has. In South Dakota, for example, the Farm Service Agency has approved the Nebraska-based home study course to meet lending requirements. It also is an approved course offering by Oglala Lakota College sites across South Dakota's Pine Ridge and Rosebud Indian reservations. Other states have patterned beef and sheep home study courses after Nebraska's beef home study, and one state is exploring the option of patterning a bison management course after it.

Impact:

A recent survey of 165 participants shows beef producers reduced costs an average of \$15 per head after taking the course. Since the course began in 1993, the overall benefit has exceeded \$6 million, based on the number of cows involved.

More than 90 percent of respondents said they would make management changes because of the course. "I've seen a lot of changes in the ranching business and I believe that keeping abreast of the new technologies, as well as being refreshed in the basics, is just as important in the ranching business as it is in any other occupation," said a third-generation Nebraska rancher. Another participant reported cutting calf sickness in half by changing his operation's feeding and health program based on course information. One hearing-impaired producer, who especially appreciated the chance to learn more about his business at home, noted the courses have the right mix of lay terminology and technical terms to be interesting and informative.

Funding:

User fees

NU Cooperative Extension

Smith-Lever 3(b) and (c)

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Summary:

Beef Cow Basics, a University of Nebraska Cooperative Extension home study course, lets cattle producers learn the latest beef nutrition, health care, marketing and food safety information at home on their own schedules. The program, first offered in 1993, has been so successful that several other states have patterned their beef and sheep programs after it. More than 4,500 courses have been distributed to producers from more than 40 states, Bosnia, Mexico and Brazil. Organizers estimate that this course saves producers about \$15 per head. That's a production savings for all participants of more than \$6 million, based on the number of cattle involved.

Competitive Agricultural Systems in a Global Economy

Topic: Beef Quality Assurance Program

Issue: (Who cares and why?)

As the nation's leader in beef cattle slaughter, bolstering consumer confidence in the quality of beef is critical to Nebraska's economy. Equally crucial is improving cattle profitability all along the food chain.

What has been done?

University of Nebraska Cooperative Extension collaborates with the Nebraska Cattlemen, the Nebraska Beef Council and the Nebraska Veterinary Medical Association to provide Beef Quality Assurance (BQA) training. The voluntary training helps participants focus on management skills and science-based production techniques to avoid defects, improve beef quality and safety, encourage high industry standards and boost consumer confidence in beef. More than 3,000 Nebraska producers are now BQA-certified and oversee more than 40 percent of the state's feeder cattle.

Impact:

Demand for BQA-certified cattle has tripled since 1998. Under contracts signed with meat packers for 2000, 52,000 head of BQA-certified cattle are expected to be sold in the Nebraska Corn Fed Beef program. At \$16 per head, this represents \$832,000 in added value for BQA participants. The demand for cattle of this type and quality was so high in 1999 that approximately half of the cattle that met BQA specifications sold in premium programs other than the Nebraska Corn-Fed Beef Program.

BQA materials from the Nebraska program have been adopted partly or entirely by 15 other states. Program materials have been distributed to 30 states and are available on compact discs or on the Internet.

Funding:

NU Cooperative Extension
Nebraska Beef Council
Nebraska Cattlemen
Nebraska Veterinary Medical Association
USDA Cooperative States Research, Education and Extension Service
Smith-Lever 3(b) and 3(c)

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Summary:

University of Nebraska Cooperative Extension collaborates with beef industry groups on the Beef Quality Assurance program, which teaches producers management and production techniques that improve beef quality and safety, encourage high industry standards and boost consumer confidence in beef. Demand for cattle certified under extension's Beef Quality Assurance program tripled from 1998 to 2000. In 2000, packers will pay about \$16 more per head for an estimated 52,000 head of BQA-certified Nebraska cattle expected to be sold in the Nebraska Corn-Fed Beef Program. That represents \$832 in added value for the state's 3,000-plus BQA participants, who are responsible for 40 percent of Nebraska's feeder cattle.

Competitive Agricultural Systems in a Global Economy

Topic: Pork Quality Assurance Program

Issue: (Who cares and why?)

Of the nearly 6.8 million pigs marketed in Nebraska during 1998, about 72 percent were marketed to Nebraska packers who required producers to be certified through the Pork Quality Assurance (PQA) program. For Nebraska hog producers struggling to survive amid low prices, becoming certified through this program can add value to their products.

What has been done?

University of Nebraska Cooperative Extension collaborates with the Nebraska Pork Producers Association and the National Pork Producers Council to provide PQA training. The training helps participants focus on management skills and science-based production techniques to avoid disease, improve pork quality and safety and encourage high standards industry-wide. By the end of 1998, about 1,250 Nebraska pork producers who were responsible for raising nearly 1.3 million pigs annually had participated in extension PQA training programs.

Impact:

Nationally, PQA-certified producers have reported decreased drug and labor costs or improved herd health and efficiencies resulting in savings of \$2 to \$3 per head. Based on an estimated \$2.50 per head, the potential savings for participating Nebraska pork producers is about \$3.16 million annually.

Funding:

NU Cooperative Extension
Nebraska Veterinary Medical Association
National Pork Producers Council
Nebraska Pork Producers Association

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Summary:

Pork Quality Assurance training helps Nebraska producers use management skills and science-based production techniques to avoid disease, improve pork quality and safety, and encourage high industry standards. University of Nebraska Cooperative Extension collaborates with the National Pork Producers Council and the Nebraska Pork Producers Association to provide this training. By late 1998, about 1,250 Nebraska pork producers who were responsible for raising nearly 1.3 million pigs annually had participated in extension's PQA training programs. Nationally, PQA-certified producers reported decreased drug and labor costs or improved herd health and efficiencies resulting in savings of \$2 to \$3 per head. Based on an estimated \$2.50 per head, the potential savings for participating Nebraska pork producers is about \$3.16 million annually.

Competitive Agricultural Systems in a Global Economy

Topic: Beef IRM/Grazing Management

Issue: (Who cares and why?)

Making the most of grazing opportunities and fine-tuning other management strategies can help cattle producers cut costs, improve efficiency and improve their bottom line.

What has been done?

University of Nebraska Cooperative Extension designed educational programs for producers to explore new management techniques and analyze their grazing programs. An Integrated Resource Management (IRM) conference, offered for the fifth year, that teamed Extension with the Nebraska Cattlemen, is one such program. It offered information on changing calving dates, optimizing production with genetics and increasing grazing days. Another is a four-day grazing management and beef cow production short course. Its sessions were offered at two-month intervals so participants could see how implementation of grazing management practices affected season-long forage production.

Impact:

IRM conference participants who indicated they would try the new management techniques had the potential to reduce annual cow costs \$25 per cow in just one year. Twelve of the 28 participants of the 1998 Eastern Nebraska Grazing Management and Beef Cow Production short course responded to a follow-up survey. They indicated they had or would change grazing, watering or herd health management practices. They estimated savings of \$28 per cow-calf pair annually.

Funding:

User fees

Nebraska Cattlemen

Farm Service Agency's Environmental Quality Incentive Program

NU Nebraska Cooperative Extension

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Summary:

Beef producers need top management techniques to improve profits. The Integrated Resource Management conference and the Eastern Nebraska Grazing Management and Beef Cow Production short course, offered by University of Nebraska Cooperative Extension, were designed to do that. The IRM conference had the potential to save \$25 per head, or a total of more than \$25,600 for a 1,000 cow herd in one year. Following the grazing course, 12 respondents estimated saving \$28 per head, for an annual savings of \$23,500 for 840 cow-calf pairs. One participant of the grazing course said, "I got enough out of this one class to pay the registration for the whole short course, but I'll be back again." And he was.

Competitive Agricultural Systems in a Global Economy

Topic: Beginning Farmer Program

Issue: (Who cares and why?)

Nebraska agricultural producers are aging and there are fewer young operators. Nearly 25 percent of Nebraska's farmers and ranchers are over age 65 while only 11 percent are under age 35. Older producers keep farming longer because there are fewer young people to take their places. Fewer young people are beginning to farm and ranch partly because of tremendous investments in land and machinery, especially amid low commodity prices.

What has been done?

University of Nebraska Cooperative Extension launched a beginning farmer program in 1999 to address this age dilemma. The program provides one-on-one consultation as well as information, contacts and ideas for potential new farmers and those nearing retirement. Services include helping older producers sort out tax consequences of renting or selling their land and helping beginning farmers/ranchers plan their cash flow and financing for a solid start.

Impact:

This new program is designed to help both older and young producers with the goal of assuring that family farms and ranches remain an important part of the state's economy, culture and communities. The program's aim is to provide beginning producers with information, assistance and ideas while helping some of the state's 12,000 producers over age 65 through the transition toward eventual retirement.

Funding:

Smith-Lever 3(b) & (c)

University of Nebraska Cooperative Extension

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Summary:

Nebraska's farmers are getting older and fewer young people are taking their places. Nearly 25 percent of the state's farmers and ranchers are over age 65 while only 11 percent are under 35. A new University of Nebraska program is tackling this age dilemma. Cooperative Extension launched its beginning farmer program in late 1999 to help younger farmers get off to a solid start and give older farmers ideas to successfully transition out of farming. Services include one-on-one consultation, information and contacts. 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: Beef Profitability Roundups

Issue: (Who cares and why?)

Low prices in recent years meant many Nebraska cattlemen faced tight cash flow and little or no profits. Nebraska ranks second nationally in cattle and calf production so helping cattle producers stay in business is important to both individual cattle operations and to the rural communities they support.

What has been done?

University of Nebraska Cooperative Extension organized a series of Beef Profitability Roundup meetings in west central Nebraska, home to many of the state's commercial cattle operations, to specifically address profitability issues. Meetings provided information to help producers identify ways to reduce production costs and add value to beef cattle. Nearly 200 people attended the five meetings.

Impact:

Organizers surveyed 94 participating cattle operation managers about the meetings. The participants estimated information from these meetings was worth \$38 per head or a total of nearly \$1.5 million based on the nearly 38,000 head of cows the operations manage. Respondents said they planned to make changes in bull selection, heifer development, mineral supplements, herd health and participation in the Nebraska Corn Fed Beef program as a result of these meetings.

Funding:

University of Nebraska Cooperative Extension

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Summary:

When Nebraska cattle producers faced tough financial times in recent years because of low beef prices, University of Nebraska Cooperative Extension organized meetings in west central Nebraska to specifically address profitability issues. These Beef Profitability Roundups provided information to help producers reduce production costs and add value to beef cattle. Nearly 200 people attended the five meetings. Managers of 94 cattle operations that participated in the workshop estimated the information received at these meetings was worth \$38 per head, for a total estimated value of nearly \$1.5 million based on the nearly 38,000 cows these operations manage.

Competitive Agricultural Systems in a Global Economy

Topic: Nuplains White Wheat

Issue: (Who cares and why?)

Nebraska producers need every edge to successfully compete in growing global markets. Development of the first hard white winter wheat designed for Nebraska's growing conditions should provide such an edge.

What has been done?

A team of USDA-Agricultural Research Service and University of Nebraska scientists developed the new variety called Nuplains. It is expected to be available for farmers to plant in fall 2000. Hard white wheat flour is primarily used to produce whole wheat bread, flat breads (tortillas and pitas) and Asian noodles, a large and expanding market. Nuplains is the most winter hardy white wheat available and also may provide a new planting option for wheat growers in other High Plains states. White wheat is new to Nebraska so a committee representing the state's wheat growers, NU's Institute of Agriculture and Natural Resources and state agencies is educating growers, elevator operators and others about white wheat production, handling and potential markets.

Impact:

Hard white wheat offers Nebraska wheat growers a chance to diversify their production and tap a new market. Asia imports 400 million bushels of white wheat annually from Australia and elsewhere. Nuplains should give Nebraska a chance to vie for part of this huge and rapidly growing market. Nebraska produced nearly 85 million bushels of hard red winter wheat in 1998 and typically exports half its production.

Funding:

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

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Summary:

The first hard white winter wheat adapted to Nebraska's growing conditions will be available for planting in fall 2000. This new variety, called Nuplains, gives Nebraska wheat growers the chance to compete in new markets. Hard white wheat is used for whole wheat breads, tortillas, pitas and Asian noodles, a growing market. University of Nebraska and USDA-Agricultural Research Service scientists, with financial assistance from the Nebraska Wheat Board, developed Nuplains, the most winter-hardy white wheat available. A committee of representatives from the Institute of Agriculture and Natural Resources, wheat producers and state agencies is educating growers, elevator operators and others about white wheat production, handling and potential markets.

Competitive Agricultural Systems in a Global Economy

Topic: BVD Skin Test

Issue: (Who cares and why?)

Bovine Viral Diarrhea (BVD) is a serious cattle disease that costs U.S. cattle producers up to \$150 million annually. An infected pregnant cow can pass BVD to her unborn calf; the calf's immature immune system mistakes it for a natural part of the system. The calf is born carrying a persistent, unrecognizable infection. Persistently infected animals aren't common but can be difficult to detect and a single case can devastate a herd. Producers can lose up to 10 percent of the calves born in a herd from infections associated with BVD.

What has been done?

Until now, blood tests have been the only way to detect persistent BVD infection but they aren't accurate until calves are about 3 months old. A University of Nebraska veterinary scientist adapted a skin sampling technique that can be used to accurately test calves at or shortly after birth. The test involves notching a calf's ear and sending the sample to the NU Institute of Agriculture and Natural Resources Veterinary Diagnostic Lab for standard testing. The skin test proved accurate in tests of more than 500 animals. The method is being further tested in collaboration with Iowa State University researchers.

Impact:

The skin test allows producers to identify infected calves soon after birth and remove them from the herd sooner, reducing chances they'll spread infection. Breeding stock producers test for BVD fairly routinely; but others tend to test only if a problem appears. This new, simpler test may encourage more testing, which is a step toward identifying and eradicating BVD.

Funding:

NU Agricultural Research Division
Hatch Act

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Summary:

A simple test developed by a University of Nebraska veterinary scientist should help cattle producers determine if newborn calves carry the virus that causes Bovine Viral Diarrhea (BVD), a potentially devastating disease. While blood tests commonly used to detect BVD aren't accurate until calves are about 3 months old, this Institute of Agriculture and Natural Resources research found that a simple skin test is accurate on calves tested hours after birth. This new test should help producers to identify and remove persistently infected calves from the herd before they can infect others. It could bring producers a step closer to eradicating a difficult-to-detect disease that costs the U.S. beef industry \$150 million annually.

Competitive Agricultural Systems in a Global Economy

Topic: Manure Management/Phosphorous Study

Issue: (Who cares and why?)

Proper management is key to using manure as fertilizer. University of Nebraska researchers are studying how to manage manure applications to make the most of crop nutrients and protect the environment.

What has been done?

University of Nebraska agronomists set up test plots to compare runoff and other agronomic characteristics on plots fertilized with manure and conventional fertilizer using various tillage and application schemes. They are focusing on phosphorous, which can contaminate surface water if excess washes off fields into streams. They share their findings with producers during educational programs at the site.

First-year results showed that manure provides a protective cover that reduces runoff from fields during the critical April to July period when soil is most vulnerable to heavy runoff. Manured plots had 35 to 80 percent less runoff than conventionally fertilized plots. Manure application timing and tillage strongly influence the degree of runoff protection. Manured plots also had better yields and soil quality.

Impact:

Proper manure management is an economic and environmental concern for Nebraska's livestock industry, which generates about 27 million tons of animal waste annually. This research will provide information about application rates, timing and tillage practices to reduce the chances of phosphorous polluting surface water.

Funding:

Nebraska Department of Environmental Quality
NU Agricultural Research Division
Hatch Act

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Summary:

Proper manure management is an economic and environmental concern for Nebraska's livestock industry, which generates about 27 million tons of animal waste annually. University of Nebraska agronomists are studying how to manage manure applications, timing and tillage practices to make the most of crop nutrients and protect the environment. They're studying runoff and a variety of other agronomic factors. First-year results showed manure provides a temporary protective cover that reduces runoff from fields during the critical April to July period when soil is most vulnerable to heavy runoff. Manured plots had 35 to 80 percent less runoff than conventionally fertilized plots. Manure application timing and tillage strongly influence the degree of runoff protection. Researchers and extension staff team to produce educational programs at the research site for cattle feeders, farmers and regulators.

Competitive Agricultural Systems in a Global Economy

Topic: Corn Borer Movements

Issue: (Who cares and why?)

Understanding the traveling habits of European corn borer moths under different field conditions should help reduce the odds of this major corn pest developing resistance to Bt corn.

What has been done?

University of Nebraska entomologists studied European corn borer moth movements in irrigated and dryland cornfields for three years. It was previously thought that moths typically leave fields before mating, but researchers needed to know what happens in Nebraska's large irrigated fields. They were surprised to find that many female moths stay close to home, especially in damp, humid irrigated fields. This research also showed that moth movements differ in irrigated and nonirrigated fields, that moth dispersal is highly variable and that field conditions significantly influence that movement.

Impact:

This information about moth movements under different field conditions is aiding decisions about where to locate non-Bt corn plots that provide European corn borer refuges amid Bt corn. Refuges are among strategies mandated to prevent or slow development of Bt resistance among corn borers. Seed company recommendations for refuge planting distances, which every farmer who plants Bt corn must follow, are based partly on this Nebraska research.

Funding:

North Central Regional Corn Boring Insect Research Project (NC205)
Commercial seed companies
NU Agricultural Research Division
Hatch Act

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Summary:

University of Nebraska entomology research is deciphering European corn borer moth movements, especially in irrigated corn. This research is providing information that should help reduce chances that the major corn pest will become resistant to Bt corn. This research revealed differences between irrigated and nonirrigated corn and found that many female moths stay close to home, especially in damp, humid irrigated fields. Results are aiding decisions about placement of non-Bt corn plots to provide European corn borer refuges amid Bt corn. Refuges are among strategies mandated to prevent or slow development of Bt resistance in corn borers. Seed company recommendations for refuge planting distances, printed on Bt seed corn bags, are based partly on this research.

Competitive Agricultural Systems in a Global Economy

Topic: Viral Latency

Issue: (Who cares and why?)

Viruses are a serious health threat to animals and people. Two closely-related viruses, Bovine Herpes Virus 1 (BHV-1) and human herpes simplex virus type 1 (HSV-1), are especially insidious and difficult to control because they cause latent infections. In latency, a virus waits silently in cells, then reactivates to attack the host and spread infection. BHV-1 costs cattle producers more than \$500 million annually; available vaccines can cause abortion and disease in calves and don't stop the disease from spreading. No vaccines are available for HSV-1, a serious venereal disease and the leading cause of infectious corneal blindness.

What has been done?

A University of Nebraska veterinary scientist studying the genetics of latency in herpes viruses discovered a latency-related gene in BHV-1 and is the first researcher to demonstrate that the protein this gene produces inhibits programmed cell death. The latency-related gene, found in both BHV-1 and HSV-1, acts like a switch. When it's on, the virus inhibits programmed cell death and both the host cell and virus survive. The Institute of Agriculture and Natural Resources researcher believes this mechanism prevents viruses from destroying their sites for latency, helping perpetuate the viruses in their hosts.

Impact:

Understanding and controlling latency may be the key to new herpes virus treatments and vaccines. Latency helps viruses survive by keeping infected neurons alive and allowing viruses to periodically reactivate and infect other hosts. If researchers can discover how to switch off the latency-related gene and prevent a virus from becoming latent, they could make better vaccines and slow or inhibit virus transmission.

Funding:

Hatch Act
NU Agricultural Research Division
USDA competitive grants
Elsa U. Pardee Foundation grant
NU Center for Biotechnology

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Summary:

Understanding the genetic circuitry that allows herpes virus to become latent is a first step in figuring out how to control latency. A University of Nebraska veterinary scientist's discoveries provide some clues. He discovered a viral gene and its protein product that control latency in two disease-causing viruses, Bovine Herpes Virus 1 in cattle and human herpes simplex virus type 1 in people. BHV-1 costs cattle producers more than \$500 million annually. HSV-1 is a serious venereal disease and the leading cause of infectious corneal blindness. His long-term goal is to turn off the genetic switch that allows these viruses to become latent. Preventing latency could be a way to make better vaccines and to slow or stop these herpes viruses from spreading.

Competitive Agricultural Systems in a Global Economy

Topic: Chromosome Sorting

Issue (Who cares and why?)

Creating a genetic map of wheat chromosomes is a long, tedious and crucial step toward identifying and harnessing the genes that control economically important traits, such as yield or disease resistance. Less than 1 percent of wheat chromosome material contains genes, and of those 70,000 to 80,000 genes, only about 1,000 interest crop scientists.

What has been done?

A University of Nebraska plant molecular biologist developed a method for sorting wheat chromosomes that will speed the mapping process. The process uses a flow cytometer, which sorts tiny particles according to size, and specialized wheat lines that are normal except for a single chromosome with only a short arm that carries useful genes and is dramatically smaller than normal chromosomes.

Impact

The NU technique enables the team to quickly sort batches of chromosomes to 95 percent purity very quickly — reducing lab work almost 60-fold and speeding the mapping process. Because flow cytometry facilities are available worldwide, the sorting method is likely to become a common tool for geneticists. This is basic research with potential long-term practical benefit. Once key genes are located, plant breeders can use them to develop new varieties with improved characteristics, such as pest resistance or nutritive value, to benefit growers and consumers.

Funding:

Hatch Act
Nebraska Corn Board
NU Agricultural Research Division

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Summary:

A technique developed by University of Nebraska scientists is speeding the process of identifying genes responsible for economically important traits in wheat, such as disease resistance or yield. The team is the first to use their chromosome sorting technique in plants. They're applying it to greatly speed up the laborious process of mapping wheat chromosomes and pinpointing the location of economically important genes. This is basic research with long-term practical application. Once key genes are located, plant breeders can use them to develop new varieties with improved yields, pest resistance or nutritive value to benefit growers and consumers alike.

Competitive Agricultural Systems in a Global Economy

Topic: Tortillas from Nebraska Corn

Issue: (Who cares and why?)

Tortillas and tortilla chips represent a fast-growing market for corn, both domestically and in Latin America. Matching the qualities of Nebraska corn to this huge appetite could open new, higher-value markets for the state's farmers.

What has been done?

A University of Nebraska Institute of Agriculture and Natural Resources food scientist tested the quality of tortillas made from Nebraska corn using traditional, whole-kernel alkaline processing, the preferred method for tortilla production. His team analyzed the cooking quality of both white and yellow corn under varied conditions and determined which processing conditions produce the best and most tortillas. They developed recommendations for changes in processing softer corn to improve tortilla-making qualities.

Impact

This research provides specific information about the quality, performance and specialty food potential for Nebraska yellow and white corn, and demonstrates Nebraska corn provides the quality characteristics manufacturers demand. Providing processing information for producing better tortillas from U.S. corn is especially important for Latin American markets where hard local varieties are favored. Nebraska's corn industry is using corn quality information to promote value-added sales of the state's leading crop.

Funding:

Nebraska Corn Board
Mexican government
NU Agricultural Research Division
Hatch Act

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Summary:

The Nebraska corn industry is using findings from University of Nebraska food science research to promote Nebraska corn's use in the fast-growing domestic and Latin American tortilla and tortilla chip markets. Institute of Agriculture and Natural Resources scientists tested tortilla-making quality of Nebraska white and yellow corn. They analyzed cooking quality under varied conditions and determined which processing conditions yield the best and most tortillas. This research provides specific information about the quality, performance and specialty food potential for Nebraska yellow and white corn. It offers processing information for producing better tortillas from Nebraska corn, an important factor for the Latin American market where local varieties are favored. Findings could help expand higher-value markets for the state's leading crop.

Competitive Agricultural Systems in a Global Economy

Topic: Screwworm Test

Issue: (Who cares and why?)

Screwworms are a potentially deadly parasite of livestock and other warm-blooded animals. They've been eradicated from the United States but remain a major concern internationally and U.S. officials must guard against accidental reintroductions. Quick, accurate identification of suspected screwworms is important to international eradication efforts.

What has been done?

Entomologists at the USDA-Agricultural Research Service Midwest Livestock Insects Research Unit at the University of Nebraska developed a fast, simple test that accurately identifies screwworms. It's part of ongoing research at the world's only screwworm research rearing station, which USDA-ARS operates in cooperation with NU's Institute of Agriculture and Natural Resources. This ELISA, or enzyme-linked immunosorbant assay, accurately determines if a suspect fly, larva, pupa, egg or fly part actually is a screwworm.

Impact:

This test can be used worldwide to identify suspected screwworms, saving time and money in international eradication efforts. It's easy to use, more than 99 percent accurate and provides answers within three hours. Previously, suspects had to be shipped to a laboratory for initial identification, meaning a long wait for officials who might have to launch expensive measures to quell reinfestation if the suspect proved to be a screwworm.

Funding:

USDA-Agricultural Research Service
NU Agricultural Research Division

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Summary:

A simple, fast, accurate test developed by USDA-Agricultural Research Service scientists at the University of Nebraska provides a new tool in international efforts to eradicate screwworms. A potentially deadly parasite of warm-blooded animals, screwworms devastated the southern cattle industry before they were eradicated from the United States in the late 1970s. This tropical insect remains a major problem in some other countries. Entomologists at USDA's Midwest Livestock Insect Research Unit at NU developed an easy to use test that quickly determines whether a suspect egg, fly, larva or pupa actually is the dreaded pest. Rapid detection is important to control efforts. Previously, suspects had to be shipped to labs for testing. This test is 99 percent accurate, provides results in three hours and can be used worldwide.

Competitive Agricultural Systems in a Global Economy

Topic: N-Efficient Sorghum Lines

Issue: (Who cares and why?)

Nitrogen fertilizer is a significant expense for sorghum growers. One way to reduce fertilizer costs is to develop sorghum varieties that use nitrogen more efficiently.

What's been done?

University of Nebraska agronomists identified two sorghum lines that use nitrogen 25 percent more efficiently than most sorghum lines used as parents for today's hybrids and still yield about the same. The new lines produce about 50 pounds of grain per pound of nitrogen used, compared to 40 pounds for typical sorghum. Both lines are adapted to Nebraska growing conditions. Institute of Agriculture and Natural Resources scientists are studying the genetics of these lines before releasing them to commercial plant breeders for use in hybrid breeding programs. The lines came from China and were identified through INTSORMIL, a U.S. Agency for International Development cooperative research program headquartered at NU.

Impact:

These lines provide the genetic basis for new sorghum hybrids that yield well and need less nitrogen fertilizer. That translates into lower fertilizer costs. IANR researchers estimate growers could save \$3 per acre or more on nitrogen fertilizer if the new lines are used to produce more efficient hybrids.

Funding:

INTSORMIL (U.S. Agency for International Development)
NU Agricultural Research Division
Hatch Act

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Summary:

University of Nebraska agronomists have identified two promising sorghum lines that need 25 percent less nitrogen fertilizer than conventional hybrids to produce comparable yields. They're studying these lines, genetics and eventually will release them to commercial breeders for use in developing new, more nitrogen efficient sorghum hybrids that reduce production costs. Institute of Agriculture and Natural Resources researchers estimate farmers could reduce fertilizer costs by about \$3 per acre if the new lines are used to produce more efficient hybrids.

Competitive Agricultural Systems in a Global Economy

Topic: Economic Benefits of Chase Dry Bean

Issue: (Who cares and why?)

Nebraska is among the nation's top dry edible bean producing states. During the early 1990s, rust epidemics severely damaged pinto bean crops in southwestern Nebraska. Facing yield losses and costly fungicide treatments, producers asked the University of Nebraska for help.

What has been done?

NU Institute of Agriculture and Natural Resources dry bean breeding team developed the first pinto bean with rust resistance. It also offered resistance to three common bacterial diseases. NU released the high-yielding pinto, called Chase, at the request of the Nebraska Dry Bean Growers Association. Chase became available in 1995 as an interim variety to address an urgent situation. The multiple disease resistance meant farmers didn't need to use fungicides on fields planted to Chase. Chase also yielded 7-10 percent more than the average of other pintos in 1990-98 trials.

Impact:

Chase's rust resistance eliminated the need for expensive fungicide treatments and its high yields gave growers an edge even when diseases weren't a problem. An IANR agricultural economist analyzed the economic benefits of Chase's superior yields and disease resistance. He calculated that this variety is generating at least \$5 million in total direct benefits for growers in Nebraska and surrounding bean growing regions during its projected 1995-2002 life span. That includes at least \$2 million total benefit for Nebraska users and \$3 million for users in neighboring states, based on a \$25-\$35 per acre yield benefit and a \$5 per acre production cost savings.

Funding:

Nebraska Dry Bean Commission
University of Nebraska Agricultural Research Division
Hatch Act

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Summary:

University of Nebraska dry bean breeders developed Chase, the first pinto bean variety to provide resistance to rust and three common bacterial diseases. The Institute of Agriculture and Natural Resources made this high-yielding variety available in 1995 to help address an urgent problem of continuing rust epidemics in southwest Nebraska pinto acres. Planting this rust resistant variety eliminated the need for expensive fungicide treatments. An IANR agricultural economist estimates this variety is generating at least \$5 million in total direct benefits for growers in Nebraska and surrounding bean growing regions during its projected 1995-2002 life span. That includes at least \$2 million total benefit for Nebraska users and \$3 million for users in neighboring states.

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 \$215 million in Nebraska from 1992 through 1999. Annual net economic benefits grew from \$1 million in 1992 to an average of \$43 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 \$215 million net cumulative economic benefit to Nebraska from 1992 through 1999.

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 five years that Bt corn has been registered. Corn borers nationwide remain susceptible to Bt toxins.

This 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 the 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 four years of testing 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. This 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: Lean Bacon Processing

Issue: (Who cares and why?)

Pork producers are producing leaner pigs in response to consumers' concerns about fat, but there are challenges to cooking and processing today's leaner bacon. The National Pork Producers Council asked University of Nebraska researchers to help develop better ways to process and cook bacon, particularly to meet the needs of fast-food restaurants that are topping sandwiches with bacon. That's a key growth area for bacon consumption as consumers shift away from eating it as a center-of-the-plate item with eggs and toast.

What has been done?

NU Institute of Agriculture and Natural Resources meat scientists used 1,590 pigs from six genetically different lines, feeding them four different diets ranging from low to high protein, to slaughter weights of 250, 290 or 350 pounds. Bellies were evaluated for leanness and fat and cooked either on a conveyor belt or in a microwave, and further studied. Technologies to evaluate amount of lean and fat and the meat's color have been developed using computer-linked camera imaging. Cooking color, degrees of doneness and how much distortion occurs during cooking have been studied. The goal was to determine how different factors affect a pig's leanness and how leanness affects bacon processing and cooking. Among other things, it's important that bacon used on sandwiches does not curl or break apart easily.

Impact:

While findings aren't complete, they should help quantify how different levels of protein in a pig's diet affect its leanness; how leanness contributes to bacon's tendency to crack and fall apart during slicing or cooking; how different genetic lines might look leaner because their muscles are darker; and at what point pigs get too big to produce desirable bacon. In addition to changing how pigs are fed and raised, the research could lead to changes in processing equipment.

Funding:

National Pork Producers Council
NU Agricultural Research Division
Hatch Act

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Summary:

As pork producers raise leaner pigs in response to consumer demand, and as bacon becomes more common as a sandwich condiment than on a plate beside eggs and toast, University of Nebraska Institute of Agriculture and Natural Resources research is helping determine how best to cook and process the leaner bacon. Meat scientists are trying to determine how such factors as the amount of protein fed to pigs and their slaughter weight affect how the bacon cooks and processes. They're particularly interested in helping produce a lean bacon that doesn't curl or break apart easily so it's well suited to sit atop a sandwich.

Competitive Agricultural Systems in a Global Economy

Topic: Commercializing Remote Sensing

Issue: (Who cares and why?)

Remote sensing and related spatial information technologies are powerful tools for assessing natural and human-made environments that are used mostly by university and government scientists. Many private companies are interested in putting these technologies to work for their businesses but steep start-up and training costs are obstacles.

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. This program works with companies to adapt these technologies to a specific application the company identifies. If successful, the technology is transferred to the commercial partner.

In its first year, the program completed three projects and began a fourth. Completed contracts evaluated the use of: remote sensing and GIS to assess crop hail damage; aerial imagery for improving growth and yield models for corn and soybeans; and remote sensing and GIS to enhance oil and gas exploration.

Impact:

This program is developing practical commercial uses for spatial information technology and saving money for companies as they learn to use it. In the hail-loss adjustment project, for example, remote sensing allows insurance adjusters to precisely locate damaged areas and save time physically surveying the damage. The company conservatively estimates this technology could reduce adjustment time about 10 percent, saving the company about \$350,000 annually. If adopted by the entire industry, savings are estimated at about \$2.8 million per year. More accurate assessments mean fewer overpayments and lower crop insurance premiums for farmers.

Funding:

NASA

NU Center for Advanced Land Management Information Technologies

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Summary:

A collaboration between NASA and University of Nebraska researchers puts remote sensing and other spatial information technology tools that aid decision-making into the hands of private companies and saves them money. Technology that would otherwise be too expensive to develop is pioneered by NU's Center for Advanced Land Management Information Technologies in cooperation with private company partners. Developing commercial applications of these technologies for the Great Plains is the overall goal. In its first year, the program completed three projects for three companies and started another. In one application, a company estimated that using remote sensing technology developed through this program could save at least \$350,000 a year.

Competitive Agricultural Systems in a Global Economy

Topic: Grass Seed Production

Issue: (Who cares and why?)

That Kentucky bluegrass or fescue you're carefully planting and tending for your home lawn represents a budding alternative crop for Nebraska's Panhandle. The region's climate is well-suited to turf and forage grass seed production, which offers a new cropping option to help the region's farmers diversify their operations. University of Nebraska research and extension efforts are providing interested producers the information they need to produce grass seed under Panhandle growing conditions.

What has been done?

NU Institute of Agriculture and Natural Resources studies have answered questions about the potential for growing grass seed in western Nebraska including seed planting dates, the best varieties, fertility and water requirements and production practices. This research honed management procedures for producing excellent yields of high-quality turf and forage grass seed under irrigation.

NU Cooperative Extension organized grass seed production field days and other educational meetings to deliver these research findings to interested producers and let them see successful seed plots firsthand. These sessions also gave growers a chance to visit with seed production company representatives, university researchers, government agencies, crop consultants, equipment dealers and others. Extension staff work closely with the region's new grass seed association.

Impact:

In the past three years, grass seed production in Nebraska's Panhandle jumped from about 300 acres to about 1,500 harvested acres in 1999. Turf and forage grass seed production offers Panhandle producers a new crop and marketing option to help diversify their operations. It's estimated that turfgrass seed production now contributes about \$1 million annually to the region's economy.

Funding:

Hatch Act
Smith-Lever 3(b) & (c)
NU Agricultural Research Division
NU Cooperative Extension

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Summary:

That Kentucky Bluegrass or fescue you're carefully seeding for your home lawn represents a new alternative crop for Nebraska's Panhandle. University of Nebraska research and Cooperative Extension efforts are helping farmers and others establish a grass seed industry. Forage and turf grass seed production offers Panhandle producers a new crop and marketing option to help them diversify their operations. Recent University of Nebraska research honed management procedures for producing excellent yields of high quality turf and forage grass seed under irrigation. NU Cooperative Extension works with growers and provides educational sessions to deliver these research findings to interested producers. Grass seed production has jumped in the past few years and 1,500 acres of seed were harvested in 1999. It's estimated that turfgrass seed production now contributes at least \$1 million annually to the region's economy.

Competitive Agricultural Systems in a Global Economy

Topic: Pennington Seed

Issue: (Who cares and why?)

The fate of promising new alternative crops hinges on finding markets. If farmers can't sell the newcomer, it's not worth the ground it grows on. To create a value-added market for several alternative crops and aid community economic development, University of Nebraska faculty worked with Cheyenne County to attract a grass and birdseed company to Sidney, Neb.

What has been done?

As part of a long-term commitment to developing alternative crops for Nebraska's Panhandle, NU Institute of Agriculture and Natural Resources researchers over the years developed a proso millet breeding program and tested sunflower and safflower varieties. This led to varieties that are particularly well-suited to the region and laid the scientific groundwork for expanded birdseed production. In addition to crop development and feasibility studies, IANR research and Cooperative Extension staff met with owners of the Pennington Seed Co. and worked with Cheyenne County economic development staff to provide background information on these crops and the region's ability to produce them. The company opened its Sidney processing plant in the mid-1990s.

Impact:

This plant has created new jobs and economic activity for Sidney and provides a new, value-added market for farmers. It's estimated that birdseed production in Nebraska's Panhandle has increased by more than 100,000 acres since the plant opened. With a gross return of \$100 per acre, that additional acreage translates to a new market worth \$10 million annually. Integration of proso millet and sunflowers into the region's dryland cropping rotation also helps stabilize financial return for Panhandle farmers by diversifying their crop base.

Funding:

Hatch Act

Smith-Lever 3(b) & (c)

NU Agricultural Research Division & NU Cooperative Extension

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Summary:

To create a value-added market for several alternative crops and aid community economic development, University of Nebraska worked with Cheyenne County to attract Pennington Seed Co., a grass and birdseed company, to Sidney, Neb. Earlier NU Institute of Agriculture and Natural Resources research led to proso millet, sunflower and safflower varieties that perform well in the region and laid the foundation for expanded birdseed production. In addition to crop development and feasibility studies, IANR research and extension staff met with seed company owners and provided Cheyenne County economic development staff with information on these crops and the region's ability to produce them. Since the Pennington Seed Co. plant opened in the mid-1990s, Panhandle birdseed production has increased by about 100,000 acres, which translates into a new market worth \$10 million annually. These new crops help Panhandle farmers diversify their crop base. The new plant also provides jobs and other economic benefits to the community.

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 reputation and economic well-being are closely tied to quality meat products. A single recall can 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 state's poultry and meat industries on training to assure the quality and safety of Nebraska's meat products. During 1999, extension and these industries teamed to incorporate Hazard Analysis and Critical Control Points (HACCP) training into existing programs to help Nebraska's smallest processors meet the federal mandate for adopting the new standards. Through HACCP processors identify critical production points where food contamination can occur and adopt controls that improve product handling. NU extension also developed and distributed a HACCP video to all very small USDA-inspected meat and poultry processors in the United States and Puerto Rico. The video was translated into Chinese, Korean, Vietnamese and Spanish, bringing research-based information to workers in their native languages.

During the past eight years, extension specialists presented workshops to more than 612 small- to medium-sized Nebraska and Kansas firms, and consulted with more than 170 companies to help them comply with the new federal regulations.

Impact:

In 1999, Extension training helped many of Nebraska's smallest processors meet their federally mandated January 2000 HACCP deadline, assuring the quality and safety of meat products from local "mom and pop" processors. The Nebraska-produced HACCP video, provided to more than 3,500 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:

Meat processors are getting help from University of Nebraska Cooperative Extension to assure the quality and safety of meat and poultry products. During 1999, extension and these industries teamed to incorporate Hazard Analysis and Critical Control Points (HACCP) training into existing programs to help many of Nebraska's smallest processors meet the federal mandate for adopting the new standards. NU food safety specialists developed a multi-lingual training video, which was distributed to more than 3,500 companies in the United States and Puerto Rico. Using the video saved each firm as much as \$1,000 in training fees. During the past eight years, extension specialists presented workshops to more than 612 small- to medium-sized Nebraska and Kansas firms, and consulted with more than 170 companies to help them comply with the new federal regulations.

Safe and Secure Food and Fiber Systems

Topic: Food Processing Center

Issue: (Who cares and why?)

Turning Nebraska's vast livestock and crop production into processed foods here at home, instead of shipping raw commodities elsewhere for value-added processing, is vital to enhancing the state's economy. Entrepreneurs and established food processors alike get help adding that value from the University of Nebraska's Food Processing Center.

What has been done?

NU's Food Processing Center was the first of its kind when it opened in 1983 to offer a wide range of technical and marketing/business development assistance to entrepreneurs and established food processing firms in Nebraska, nationally and internationally. It has become a model for other universities. It's a one-stop source of food safety, problem-solving, product development, and technical and business information for food processors.

For example, the center's Entrepreneur Assistance Program includes a series of workshops and services for people interested in starting a food processing company. The program covers business, marketing and manufacturing issues important to new business success. Another program, the Nebraska Custom Processing Network, matches Nebraska food processors that have excess plant capacity with companies that need custom or contract production. This linkage helps both 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.

Impact:

Nebraska's food processing industry has grown from 220 food processing businesses when the center opened to nearly 400 today. 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.

Center staff estimate the Entrepreneur Assistance Program saves participating entrepreneurs about \$20,000 in food business startup costs. Since the program began in 1989, 71 percent of participants that started food businesses remain in business today, a high percentage for this competitive industry. The 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
Hatch Act
NU Cooperative Extension
NU Agricultural Research Division

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Summary:

Turning Nebraska's meat, poultry and grains into value-added processed foods helps the state's economy. The University of Nebraska's Food Processing Center offers a wide range of technical and marketing/business development assistance to entrepreneurs and established food processing firms in Nebraska, the nation and the world. Nebraska's food processing industry has grown from 220 food processing businesses when the center opened in 1983 to nearly 400 today. Food Processing Center officials estimate 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 7 percent, create 12 new jobs and invest \$100,000 in new capital projects.

Safe and Secure Food and Fiber Systems

Topic: Beef Quality Assurance Program

Issue: (Who cares and why?)

As the nation's leader in beef cattle slaughter, bolstering consumer confidence in the quality of beef is critical to Nebraska's economy. Equally crucial is improving cattle profitability all along the food chain.

What has been done?

University of Nebraska Cooperative Extension collaborates with the Nebraska Cattlemen, the Nebraska Beef Council and the Nebraska Veterinary Medical Association to provide Beef Quality Assurance (BQA) training. The voluntary training helps participants focus on management skills and science-based production techniques to avoid defects, improve beef quality and safety, encourage high industry standards and boost consumer confidence in beef. More than 3,000 Nebraska producers are now BQA-certified and oversee more than 40 percent of the state's feeder cattle.

Impact:

Demand for BQA-certified cattle has tripled since 1998. Under contracts signed with meat packers for 2000, 52,000 head of BQA-certified cattle are expected to be sold in the Nebraska Corn Fed Beef program. At \$16 per head, this represents \$832,000 in added value for BQA participants. The demand for cattle of this type and quality was so high in 1999 that approximately half of the cattle that met BQA specifications sold in premium programs other than the Nebraska Corn-Fed Beef Program. BQA materials from the Nebraska program have been adopted partly or entirely by 15 other states. Program materials have been distributed to 30 states and are available on compact discs or on the Internet.

Funding:

NU Cooperative Extension
Nebraska Beef Council
Nebraska Cattlemen
Nebraska Veterinary Medical Association
USDA Cooperative States Research, Education and Extension Service
Smith-Lever 3(b) and 3(c)

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Summary:

University of Nebraska Cooperative Extension collaborates with beef industry groups on the Beef Quality Assurance program, which teaches producers management and production techniques that improve beef quality and safety, encourage high industry standards and boost consumer confidence in beef. Demand for cattle certified under extension's Beef Quality Assurance program tripled from 1998 to 2000. In 2000, packers will pay about \$16 more per head for an estimated 52,000 head of BQA-certified Nebraska cattle expected to be sold in the Nebraska Corn-Fed Beef Program. That represents \$832 in added value for the state's 3,000-plus BQA participants, who are responsible for 40 percent of Nebraska's feeder cattle.

Safe and Secure Food and Fiber Systems

Topic: Pork Quality Assurance Program

Issue: (Who cares and why?)

Of the nearly 6.8 million pigs marketed in Nebraska during 1998, about 72 percent were marketed to Nebraska packers who required producers to be certified through the Pork Quality Assurance (PQA) program. For Nebraska hog producers struggling to survive amid low prices, becoming certified through this program can add value to their products.

What has been done?

University of Nebraska Cooperative Extension collaborates with the Nebraska Pork Producers Association and the National Pork Producers Council to provide PQA training. The training helps participants focus on management skills and science-based production techniques to avoid disease, improve pork quality and safety and encourage high standards industry-wide. By the end of 1998, about 1,250 Nebraska pork producers who were responsible for raising nearly 1.3 million pigs annually had participated in extension PQA training programs.

Impact:

Nationally, PQA-certified producers have reported decreased drug and labor costs or improved herd health and efficiencies resulting in savings of \$2 to \$3 per head. Based on an estimated \$2.50 per head, the potential savings for participating Nebraska pork producers is about \$3.16 million annually.

Funding:

NU Cooperative Extension
Nebraska Veterinary Medical Association
National Pork Producers Council
Nebraska Pork Producers Association

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Summary:

Pork Quality Assurance training helps Nebraska producers use management skills and science-based production techniques to avoid disease, improve pork quality and safety, and encourage high industry standards. University of Nebraska Cooperative Extension collaborates with the National Pork Producers Council and the Nebraska Pork Producers Association to provide this training. By late 1998, about 1,250 Nebraska pork producers who were responsible for raising nearly 1.3 million pigs annually had participated in extension's PQA training programs. Nationally, PQA-certified producers reported decreased drug and labor costs or improved herd health and efficiencies resulting in savings of \$2 to \$3 per head. Based on an estimated \$2.50 per head, the potential savings for participating Nebraska pork producers is about \$3.16 million annually.

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 *E. coli* 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, which would benefit both the 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 (OBGS) technique allows researchers to pinpoint genetic differences on *E. coli* DNA and to rapidly clone and identify the genes at those DNA sites. Using their technique, NU researchers identified two distinct 0157:H7 populations in cattle: one that causes illness in people and one that apparently is non-virulent or incapable of causing human illness. Initial results suggested that two-thirds of *E. coli* isolates from cattle are genetically related to the potentially non-virulent population.

Impact:

Discovery of genetically distinct *E. coli* 0157:H7 populations could explode current theories about human exposure to 0157:H7 strains and the outcomes of those exposures. This may provide genetic information to help trace the source of *E. coli*-related illness. Information gleaned from the OBGS technique could produce a simpler, less expensive way to do large-scale *E. coli* testing, such as in feedlots, to identify cattle carrying the disease-causing *E. coli*. The technique also is generating interest among researchers nationwide as a powerful new genetics research tool for examining plant and animal genomes more clearly than ever before.

Funding:

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

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Summary:

Using a new genetic fingerprinting method they developed, a University of Nebraska food science team discovered some surprising differences in populations of *E. coli* 0157:H7, the potentially deadly bacteria responsible for 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 feedlots.

Healthy, Well-Nourished Population

Topic: York County Health Department

Issue: (Who cares and why?)

Community leaders in one Nebraska county without a local public health department felt the community lacked both the structure and the funding to address local community health needs.

What has been done?

A University of Nebraska Cooperative Extension educator collaborated with citizens to help form the 40-member York Community Health Coalition to assess unmet community health needs. The coalition's survey revealed alcohol and drug use among young people as the top health priority. Residents also favored forming a county health department to carry out health-related prevention programs. County commissioners voted to create a health department with \$30,000 in state funds.

Impact:

These efforts generated \$50,000 in grants to fund community health services and have created a system to make the most of limited health funding by collaborating with schools, community groups and the local hospital. A smoking, alcohol and drug prevention program aimed at adolescents introduced 30 fifth and sixth graders to healthy behavior changes in its first year. More than 900 elementary students participated in health programs offered through the York Public Schools, the York County Fair and the York Children's Festival, all made possible by grants to the coalition.

Funding:

NU Cooperative Extension
Nebraska Crime Commission
Nebraska Children and Families Foundation

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Summary:

When York County community leaders said they felt the county lacked both the structure and the funding to address community health needs, a University of Nebraska Cooperative Extension educator pitched in. She collaborated with citizens to form the 40-member York Community Health Coalition to help determine health needs. The coalition's work led to starting a county health department and a smoking, alcohol and drug use prevention program among adolescents. In the after-school program's first year, 30 fifth and sixth graders were introduced to healthy behavior changes and alternatives to smoking, drinking and using drugs.

Healthy, Well-Nourished Population

Topic: Selenium Protein Patented

Issue: (Who cares and why?)

There's strong evidence that selenium, a trace element essential to a healthy immune system, helps prevent some cancers and slow the progression of HIV/AIDS. A human protein discovered by a University of Nebraska biochemist may help explain and tap selenium's disease fighting potential.

What has been done?

The University of Nebraska and the National Institutes of Health have patented the new human protein, which contains selenium. The biochemist identified the previously unknown protein while working at NIH and has studied it since joining NU. His team is scrutinizing the new protein at the biochemical and molecular levels in an effort to answer important basic questions about selenium's importance and anti-cancer potential. The protein's novel characteristics show promise as the basis for tests that could predict or detect some cancers.

Impact:

If this and other research proves selenium's protective powers, people likely to develop certain cancers might be advised to take more selenium. Research on this protein also could lead to new tools for early cancer diagnosis or to identify people at risk of developing cancer, especially prostate cancer.

Funding:

National Institutes of Health
Cancer Research Foundation of America
NU Agricultural Research Division
Hatch Act

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Summary:

The University of Nebraska and the National Institutes of Health have patented a protein that might help prevent some cancers and slow HIV/AIDS progression. An NU biochemist discovered the protein, which contains selenium. There's strong evidence that selenium protects against some cancers and benefits people with HIV/AIDS, but scientists don't understand how that happens. Institute of Agriculture and Natural Resources scientists think this protein might provide some answers. Researchers also hope they eventually can harness the protein's novel characteristics to develop early cancer detection tests or to identify people at risk of developing certain cancers, especially prostate cancer.

Healthy, Well-Nourished Population

Topic: Girls' Nutrition

Issue: (Who cares and why?)

Media messages and social pressure are so strong that some girls cut nutritional corners to meet unrealistic weight goals. Their desire to achieve an ideal body shape often prompts them to eat diets barely sufficient for growth and development.

What has been done?

University of Nebraska nutrition scientists examined diets of 230 Nebraska girls ages 8-17. Researchers found girls as young as age 8 thought about dieting. From age 11 up, girls in the study were already dieting and researchers found their diets low in key nutrients. Dieters ate fewer calories and consumed significantly less calcium, other minerals and vitamin B-6 than non-dieters. Participants averaged about 850 milligrams of calcium daily, far less than the recommended 1,300 milligrams for girls 9-18, putting them at risk for osteoporosis later in life. The study also examined body image, and researchers found most participants preferred ideal body shapes thinner than their actual figures, likely reflecting media messages that thinner is better.

Impact:

The study found that girls' diets tended to become less adequate with age. Based on this finding, researchers recommend educating girls about nutrition, healthy weight goals and realistic body images even before age 8 to combat social and media messages that prompt them to risk their health in pursuit of an idealized, thin body image.

Funding:

NU Agricultural Research Division
Hatch Act

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Summary:

Many Nebraska girls eat diets barely adequate for growth and development, and so low in calcium they risk osteoporosis in later life, University of Nebraska nutrition research shows. A study of the diets of 230 girls ages 8-17 showed among other things that girls' diets become less adequate with age. The researchers recommend educating girls about nutrition, healthy weight goals and realistic body images even before age 8 to combat social and media messages that prompt them to risk their health in pursuit of an idealized, thin body image.

Healthy, Well-Nourished Population

Topic: Nutrition Education Programs

Issue: (Who cares and why?)

Refugee families and thousands of other low-resource Nebraska residents are stretching their limited food dollars by learning smarter ways to budget and shop for nutritious food, and to prepare and eat a greater variety of foods. Participants say University of Nebraska Cooperative Extension nutrition programs have helped them boost their self-confidence besides improving their nutrition habits.

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 1999, extension nutrition programs served families from Bosnia, Russia, Vietnam, Turkey and Sudan as well as long-time Nebraskans. For the fiscal year ending Sept. 30, 1999, 30,227 individuals from 8,227 families and 6,338 youth 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, local food pantries and food banks, family resource centers, after-school programs and housing authorities to offer nutrition programs that help low-resource Nebraskans.

Impact:

Nutrition program participants say these programs have helped their families eat healthier and better use their limited food budgets. One client credited her participation in extension nutrition programs and a family management class with helping her handle single parenthood and a full-time job. In return, the bilingual client translated portions of the federal Women, Infants and Children programs into Spanish for NU extension staff who collaborate on the WIC program.

Funding:

NU Cooperative Extension
USDA Food and Nutrition Services
Smith-Lever 3(b) and (c)
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 longtime 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, 1999, over 30,000 individuals and over 6,300 youth participated in these programs. One client credited her participation in extension nutrition programs and a family management class with helping her handle single parenthood and a full-time job that led her to self-sufficiency.

Healthy, Well-Nourished Population

Topic: Viral Latency

Issue: (Who cares and why?)

Viruses are a serious health threat to animals and people. Two closely-related viruses, Bovine Herpes Virus 1 (BHV-1) and human herpes simplex virus type 1 (HSV-1), are especially insidious and difficult to control because they cause latent infections. In latency, a virus waits silently in cells, then reactivates to attack the host and spread infection. BHV-1 costs cattle producers more than \$500 million annually; available vaccines can cause abortion and disease in calves and don't stop the disease from spreading. No vaccines are available for HSV-1, a serious venereal disease and the leading cause of infectious corneal blindness.

What has been done?

A University of Nebraska veterinary scientist studying the genetics of latency in herpes viruses discovered a latency-related gene in BHV-1 and is the first researcher to demonstrate that the protein this gene produces inhibits programmed cell death. The latency-related gene, found in both BHV-1 and HSV-1, acts like a switch. When it's on, the virus inhibits programmed cell death and both the host cell and virus survive. The Institute of Agriculture and Natural Resources researcher believes this mechanism prevents viruses from destroying their sites for latency, helping perpetuate the viruses in their hosts.

Impact:

Understanding and controlling latency may be the key to new herpes virus treatments and vaccines. Latency helps viruses survive by keeping infected neurons alive and allowing viruses to periodically reactivate and infect other hosts. If researchers can discover how to switch off the latency-related gene and prevent a virus from becoming latent, they could make better vaccines and slow or inhibit virus transmission.

Funding:

Hatch Act
NU Agricultural Research Division
USDA competitive grants
Elsa U. Pardee Foundation grant
NU Center for Biotechnology

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Summary:

Understanding the genetic circuitry that allows herpes virus to become latent is a first step in figuring out how to control latency. A University of Nebraska veterinary scientist's discoveries provide some clues. He discovered a viral gene and its protein product that control latency in two disease-causing viruses, Bovine Herpes Virus 1 in cattle and human herpes simplex virus type 1 in people. BHV-1 costs cattle producers more than \$500 million annually. HSV-1 is a serious venereal disease and the leading cause of infectious corneal blindness. His long-term goal is to turn off the genetic switch that allows these viruses to become latent. Preventing latency could be a way to make better vaccines and to slow or stop these herpes viruses from spreading.

Greater Harmony Between Agriculture and the Environment

Topic: Supplemental Phosphorous

Issue: (Who cares and why?)

Phosphorous is essential to beef nutrition but feeder cattle typically get too much of a good thing. The excess doesn't hurt or help cattle, but is an unnecessary expense and an environmental concern if excess phosphorous reaches streams or other surface water.

What has been done?

University of Nebraska animal scientists studied the effects of reducing dietary phosphorous on feedlot calf and yearling performance and on the amount of phosphorous in manure. They fed about 60 percent less phosphorous than typically fed in the cattle industry and could not create a diet low enough to see any effect on the cattle. Feeding less phosphorous meant less wound up in manure. Reducing dietary phosphorous 34 percent for calves and 44 percent for yearlings reduced phosphorous in manure 38 percent and 59 percent, respectively. Results show feeding dietary phosphorous supplements is an unnecessary expense. Dicalcium phosphate, a common supplement with 18 percent phosphorous, costs about \$240 per ton. This research shows feeders can save that expense and help the environment by reducing phosphorous content in manure.

Impact:

These findings are helping producers avoid an unnecessary expense and are changing industry thinking on feeding phosphorous. Feedlot nutritionists now are aware of phosphorous overfeeding and most Nebraska feedlots no longer buy this supplement. This shift in how the beef industry views phosphorous could help reduce its levels in manure applied to cropland where excess could wash into rivers, streams and lakes.

Funding:

USDA special grant
NU Agricultural Research Division
Hatch Act

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Summary:

Phosphorous is essential to beef nutrition but feeder cattle get plenty in their diets. The excess doesn't hurt or help cattle but is an unnecessary expense and an environmental concern if it gets into surface water. University of Nebraska animal scientists studied the effects of reducing dietary phosphorous on feedlot cattle performance and on the amount of phosphorous in manure. They fed about 60 percent less phosphorous than typically is fed in the cattle industry and could not create a diet low enough to see any effect on the cattle. Feeding less phosphorous did significantly reduce the amount that wound up in manure. This Institute of Agriculture and Natural Resources research showed that supplemental phosphorous is an unnecessary expense. Findings should help producers save money and reduce phosphorous overfeeding to protect water quality.

Greater Harmony Between Agriculture and the Environment

Topic: June Calving

Issue: (Who cares and why)

Moving calving season from March to June offers many advantages for ranchers in Nebraska's Sandhills, a major cow-calf producing region. University of Nebraska researchers compared costs and benefits of March and June calving to determine if matching cows' nutrient requirements with nutrients in pasture grasses would reduce production costs and improve net returns.

What has been done?

A five-year study compared spring and summer calving. Researchers compared a 165-cow summer-calving herd to spring-calving counterparts. They collected birth weight, weaning weight, pregnancy rate and feed input data, and they assessed the economics of both systems, calculating expenses and examining calf marketing opportunities. Weaning weights for summer-born steer calves were about 69 pounds less than their spring-born counterparts but they would be available for market when prices were higher.

Impact:

Researchers found that June calving puts cow needs in synchrony with Sandhills forage resources, reducing hay and feed costs and allowing cows to graze grasses at their peak nutrient content when cows most need that nutrition. While spring-calving cows each consumed 3,947 pounds of harvested native grass hay per year, summer-calving cows required only 227 pounds of hay per year, trimming feed costs about \$54 for each calf produced. Other advantages may include reduced calf sickness and death losses, reduced labor, machinery and feed costs, and the potential to sell calves in an off-season.

Funding:

U.S. Department of Agriculture
NU Agricultural Research Division
Hatch Act

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Summary:

Moving calving season from March to June offers many advantages for ranchers in Nebraska's Sandhills, a major cow-calf producing region. University of Nebraska researchers compared costs and benefits of March and June calving. June calving puts cow needs in synchrony with Sandhills forage resources, reducing hay and feed costs and allowing cows to graze grasses at their peak nutrient content when cows most need that nutrition. In this five-year study, summer calving reduced feed costs about \$54 for each calf produced. Other advantages may include reduced calf sickness and death losses, reduced labor, machinery and feed costs, and the potential to sell calves in an off-season.

Greater Harmony Between Agriculture and the Environment

Topic: Groundwater Monitoring

Issue: (Who cares and why?)

Groundwater is vital to Nebraska, supplying 90 percent of the state's drinking water and 77 percent of water for the state's 8 million irrigated acres. Monitoring that provides a detailed assessment of the groundwater system, which is crucial for its best management.

What has been done?

Through its groundwater-level monitoring program, the University of Nebraska's Conservation and Survey Division tested new monitoring technology and installed electronic data recorders in observation wells to help natural resources districts and other agencies more cost-effectively monitor groundwater. The new digital recorders store a wide range of information in memory, providing more frequent and accurate data than older mechanical recording devices. Digital recorders reduce operating costs for cooperators, who purchase instead of lease them. Information from all of the state's observation wells, including water-level graphs and maps, now is available on the World Wide Web. This saves printing costs and provides wider access to the information.

Impact:

This program is lowering costs for cooperating agencies, primarily local NRDs, and is providing scientists with better, more current information about groundwater systems. Recorders save NRDs about \$700 per year per observation well. Providing groundwater information on the Web replaced an annual printed report on groundwater level changes produced by the division and the U.S. Geological Survey, which cost \$7,500 for limited distribution. The two agencies now coordinate with the Nebraska Natural Resources Commission to provide groundwater-level information on the Web.

Funding:

NU Conservation and Survey Division
Natural Resources Districts

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Summary:

Newer electronic groundwater monitoring technology tested by the University of Nebraska's Conservation and Survey Division and transferred to many of the 23 local Natural Resources Districts saves districts about \$700 per year per observation well. The lower cost of the new digital recorders will allow for more wells to be equipped with continuous recorders. The new recorders capture groundwater information more accurately and more frequently. The Conservation and Survey Division works with the U.S. Geological Survey and the Nebraska Natural Resources Commission to make data from all of the state's observation wells available on the World Wide Web, saving the costs of a printed annual report.

Greater Harmony Between Agriculture and the Environment

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 five years that Bt corn has been registered. Corn borers nationwide remain susceptible to Bt toxins.

This 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 the 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 four years of testing 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. This monitoring and early detection of potential susceptibility changes are vital to resistance management strategies designed to preserve Bt's effectiveness.

Greater Harmony Between Agriculture and the Environment

Topic: Blue River Basin

Issue: (Who cares and why?)

Herbicide runoff from farm fields in the Blue River Basins area of Nebraska and Kansas can hurt downstream drinking water quality. Much of the water from these basins drains into Tuttle Creek Reservoir, a major drinking water source for Kansas City, Topeka and other Kansas communities. Joint research and extensive education efforts by University of Nebraska and Kansas State University researchers are attempting to reduce the threats to area drinking water supplies.

What has been done?

Computer modeling that focuses on how grain producers in the 9,700-square-mile Blue River Basins area of southeast Nebraska and northeast Kansas use and apply herbicides is helping researchers identify ways to reduce herbicide runoff into rivers and streams. Using four years of atrazine runoff data in a computer model designed to evaluate atrazine losses from three common tillage practices has helped NU Institute of Agriculture and Natural Resources researchers determine which herbicide management and tillage practices are most promising for reducing herbicide runoff from farm fields. Early results indicate several tillage and herbicide management practices potentially could cut average annual atrazine runoff by 50 percent or more. These practices are: pre-emergent herbicide incorporation broadcast application at planting or post-emergent broadcast application four weeks after planting with conventional tillage methods; using pre-emergent band application at planting and post-emergent broadcast application with minimum tillage; or using early pre-plant broadcast application three to four weeks before planting and post-emergent broadcast application with no-till.

Impact:

Results provide the scientific framework for Cooperative Extension education efforts to encourage farmers to increase proven best management practices to reduce the potential for atrazine and sediment runoff. In the long run, this research and extension effort should improve water quality in the basins and help protect drinking water supplies in Kansas.

Funding:

NU Agricultural Research Division
NU Cooperative Extension
U.S. Geological Survey water resources research grant
Hatch Act

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Summary:

Herbicide runoff from fields in the Blue River Basins area of Nebraska and Kansas can hurt drinking water quality downstream in Kansas. Joint research and extensive education efforts by University of Nebraska and Kansas State University aim to reduce the threats to drinking water. Using a computer model and four years of atrazine runoff data, Nebraska researchers are identifying the most promising herbicide management and tillage practices for reducing herbicide runoff from farm fields. Early results indicate several tillage and herbicide management practices potentially could cut average annual atrazine runoff by 50 percent or more. Findings provide the framework for Cooperative Extension efforts to encourage farmers to increase proven best management practices to reduce the potential for atrazine and sediment runoff.

Greater Harmony Between Agriculture and the Environment

Topic: *Splash*

Issue: (Who cares and why?)

With more than 8 million irrigated acres, Nebraska is second only to California in irrigated agriculture. Making the most of every drop of water through efficient water use and application is critical to agricultural profitability and water quality protection.

What has been done?

Splash, a one-on-one irrigation water management program in Nebraska's Central Platte Valley, helped irrigators reduce use of water, energy and fertilizer. Participants received irrigation management consultation from University of Nebraska Cooperative Extension and Natural Resource Conservation Service staff. These consultations educated producers about innovative irrigation technologies and research-proven irrigation best management practices. From 1994 through 1999, *Splash* directly impacted 60,000 acres, or 165 participants each irrigating an average of 365 acres.

Managing Irrigation Systems for Today and Tomorrow, launched in 1999, builds on *Splash* to target chronically high groundwater nitrate areas in the region.

Impact:

Over the program's five-year life, cooperating farmers estimate they've reduced annual pumping and irrigation costs an average of \$9.40 per acre for a \$575,000 savings. Each cooperator reduced annual irrigation water application by an average of 44.6 million gallons. Over five years, that's totaled 7.4 billion gallons, enough water to fill a train of tanker cars 2,675 miles long. Program organizers also estimate *Splash* prevented about 1.06 million pounds of nitrogen fertilizer from leaching into groundwater, saving an additional estimated \$148,000 in fertilizer costs alone.

"More people need to be in the *Splash* program," one farmer said. "Too much water is wasted." Another reported that using less water and adequately watering the crop with fewer irrigations "is a real eye opener for a lot of people and can result in water and power savings."

Funding:

Environmental Protection Agency 319 grant funds
Central Platte Natural Resources District
University of Nebraska Cooperative Extension
Smith-Lever 3(b) and (c)

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Summary:

Splash, a University of Nebraska Cooperative Extension water management program coupled with state and federal entities, helped 165 Central Platte Valley irrigators reduce their annual water use by about 44.6 million gallons each. That's a total of 7.4 billion gallons over the 5-year life of the project — enough water in the last five years to fill a train of tanker cars 2,675 miles long! The program teaches farmers how to cut water waste, use less power and prevent fertilizer from leaching into the groundwater. Since 1994, these producers applied these principles to more than 60,000 acres. They saved about \$9.40 per acre, for a total of \$575,000. More than 1 million pounds of nitrogen, worth about \$148,000, was kept from leaching into the groundwater. Managing Irrigation Systems for Today and Tomorrow, a follow-up program, began in 1999 to target chronically high groundwater nitrate areas in the region.

Greater Harmony Between Agriculture and the Environment

Topic: Irrigation Efficiency

Issue: (Who cares and why?)

Nebraska groundwater is a coveted resource, often sought by other states as well as Nebraska irrigators. Conflict surrounds water use in southwest Nebraska because of declining water levels and legal issues between Nebraska and Kansas. Efficient water use is critical for maintaining irrigated acres and the region's economy.

What has been done?

University of Nebraska Cooperative Extension presented Irrigating Efficiently, a series of in-field water management sessions in southwest Nebraska on the topic of "Irrigating Efficiently." Sessions covered irrigation scheduling, measuring stored soil moisture, fertilizer management and economic efficiency. Fifty farmers, consultants and agency personnel, representing 183,000 irrigated and dryland acres, received training.

Impact:

Water management trainees say they will do more irrigation scheduling, check stored soil moisture more often, delay first irrigation, apply last irrigation sooner, incorporate surge valves into furrow irrigation and include more rotations. Participants estimate these steps will save \$6.90 to \$7.90 per acre based on information from the meetings, for a total savings of \$732,000.

Funding:

User fees
U.S. Bureau of Reclamation
NU Nebraska Cooperative Extension
Natural Resources Districts

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Summary:

Water use is a source of conflict in southwest Nebraska and Kansas because of declining water levels and legal issues, making every drop count. "Irrigating Efficiently", University of Nebraska Cooperative Extension water management sessions, help teach best management practices and economics related to irrigation timing, measuring soil moisture and fertilizer management. Fifty farmers, crop consultants and government agency personnel attended the meetings. Participants estimate their new management practices on 183,000 irrigated and dryland acres will save \$6.90 to \$7.90 per acre, for a total of \$732,000.

Greater Harmony Between Agriculture and the Environment

Topic: Irrigation Management Education

Issue: (Who cares and why?)

Much of Nebraska's crop production depends on irrigation and nitrogen fertilizer. Conventional irrigation practices can waste water and contribute to increasing concentrations of nitrate in groundwater, a source of drinking water. University of Nebraska research and education helps farmers determine proper equipment and the best time to water and fertilize plants to maintain yields, protect water quality and reduce costs.

What has been done?

Field days and short courses are a continuing part of NU Cooperative Extension education and training for producers on the most efficient use of various irrigation systems for various crops. Nebraska, Kansas and Colorado teamed to offer the Central Plains Irrigation Short Course and Exposition. In northeast Nebraska, field days, demonstration plots and irrigation short courses educated producers. Altogether, more than 350 producers attended the Central Plains and northeast Nebraska educational programs in 1998-99. Many learned to properly determine soil moisture to apply only the amount of water plants need, with no waste. Demonstration plots promoted farming practices that reduce chances of nitrogen fertilizer leaching into groundwater. Irrigation short courses outlined new technology to allow more precise water applications.

Impact:

One-third to one-half of all participants in northeast Nebraska indicated they would change their irrigation management practices as a result of these sessions. They estimated these changes would reduce costs about \$5 per acre, or a total of \$100,000 on the 20,000 total acres they managed. Panhandle, Kansas and Colorado participants who responded to a survey farmed an average of 1,000 acres and valued knowledge gained at the Central Plains session at \$5 to \$50 per acre.

Funding:

User fees
Central Plains Irrigation Association
University of Nebraska Cooperative Extension

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Summary:

Agricultural producers are becoming more aware of the intricacies of proper water and fertilizer management of their crops, thanks to University of Nebraska research and education. Cooperative Extension-sponsored workshops teach participants how to irrigate more efficiently and to apply only as much water as crops need. Such precision practices also prevent excess nitrate from leaching away from plant roots into the groundwater. Participating northeast Nebraska irrigators estimate they saved a total of \$100,000 over two years by changing irrigation practices. In the Panhandle, Nebraska, Kansas and Colorado teamed on another irrigation management short course. Program participants surveyed, who farmed an average of 1,000 acres each, estimated the value of knowledge learned at \$5 to \$50 per acre.

Greater Harmony Between Agriculture and the Environment

Topic: Pesticide Container Recycling

Issue: (Who cares and why?)

Nebraska farmers use pesticides from hundreds of thousands of 1- and 2.5-gallon plastic containers every year. Recycling these containers turns a disposal headache into raw material for new products, often innovative and useful products.

What has been done?

University of Nebraska Cooperative Extension spearheads a statewide pesticide container recycling program where properly rinsed containers are collected at sites throughout Nebraska. Containers are inspected and temporarily stored at the sites for later grinding into tiny chips. Chips are processed elsewhere into raw material for products such as pesticide shipping pallets, drain tiles, parking lot bumpers, outdoor dimensional lumber, new pesticide containers and aircraft wheel chocks. The program is a collaborative effort of extension's pesticide specialist, extension educators, local communities, trade organizations, cooperatives, volunteers and businesses.

The U.S. Environmental Protection Agency and the national Agricultural Container Research Council tout Nebraska's program because of the high quality of cleaned, rinsed containers collected for recycling. EPA indicated it is pleased that the program provides multiple approaches for inspection/collection opportunities.

Impact:

The program has grown nearly seven-fold since it was launched in 1992 with two collections sites that recycled 20,000 containers. In 1999, the program collected and recycled a record 50-plus tons of pesticide containers at more than 50 sites in 32 counties. In 1998, the program recycled 134,100 empty pesticide containers that generated nearly 49 tons of plastic. Pesticide container recycling eliminates storage and disposal problems and helps protect the environment. Every container recycled is one less that might otherwise be improperly disposed of or unnecessarily stored.

Funding:

NU Cooperative Extension
U.S. Department of Agriculture
U.S. Environmental Protection Agency
Agricultural Container Research Council

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No Summary

Greater Harmony Between Agriculture and the Environment

Topic: Buffer Strips

Issue: (Who cares and why?)

Soil, sediment and pesticides that run off fields can pollute rivers and streams. University of Nebraska research indicates narrow strips of vegetation planted along stream banks can help keep sediments and pesticides from washing into adjacent streams.

What has been done?

NU research indicates that vegetative buffer strips 25- to 50-feet wide may be all that is needed to reduce sediments and some contaminants from reaching adjacent waterways. Related research nationwide has focused on buffer strips at least 95 feet wide to control such runoff pollution.

Researchers planted 25- and 50-foot-wide buffer strips to four different types of vegetative cover. Results show that grass strips, planted with or without trees and shrubs, were 93 percent effective at reducing the amount of sediment runoff, but less effective at reducing levels of dissolved contaminants such as atrazine, nitrate and phosphorous. Increasing buffer strip width to 50 feet improved the ability to reduce dissolved contaminants. Research also indicates buffer strips may more effectively control dissolved contaminant runoff as they mature and that buffer strip effectiveness depends on the cropping practices they replace near a stream or waterway.

Impact:

This research provides information about effective buffer strip options for Nebraska. That's important because recent legislation encourages Nebraska landowners to establish buffer strips along vulnerable streams. Most buffer strip research elsewhere focused on wider strips. Wider strips take more land out of production, which may discourage farmers from planting them. NU research showing the effectiveness of narrower strips may encourage more landowners to plant them.

Funding:

Nebraska Research Initiative
U.S. Environmental Protection Agency, Region VII
Nebraska Department of Environmental Quality
NU Water Center/Environmental Programs
NU Agricultural Research Division
Hatch Act

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No Summary

Economic Development and Quality of Life for People and Communities

Topic: Sandhills Fire

Issue: (Who cares and why?)

Ranching is a staple of life in Nebraska's sparsely-populated Sandhills. Nebraska's worst-ever range fire swept through the area in 1999, burning nearly 75,000 acres of grass in a swath 35 to 40 miles long. Ranchers lost cattle, fences, vital hay and the grass that protects the fragile hills.

What has been done?

University of Nebraska Institute of Agriculture and Natural Resources faculty and staff in the area joined other volunteers fighting the blaze. The Cooperative Extension office in Thedford became the post-fire operations' hub and its phone was the help hotline. In the aftermath, extension staff teamed with the fire relief committee, agencies and volunteers to meet fire victims' needs. Extension delivered programs offering specific information ranchers needed to help recover after the fire, including beef herd health and nutrition, forage and range management, beef reproductive management and best management practices during the recovery period.

Impact:

Within six weeks, 1,500 tons of hay were delivered through the relief committee, with many tons offered for donation. Nearly 14,000 fence posts and 450 rolls of wire were delivered and volunteers spent at least 96 days in the area, primarily helping build fence. Nearly \$37,000 in donations helped buy fencing materials. Information gained through extension's educational sessions is helping ranchers manage and protect their land during recovery and make the most of limited forage resources to provide for their livestock.

Funding:

NU Cooperative Extension
Donations for fencing/hay

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Summary:

When Nebraska's worst-ever range fire destroyed thousands of acres of Nebraska Sandhills grassland, University of Nebraska faculty and staff helped local ranchers fight the fire and set up an emergency command post at a local Cooperative Extension office. Extension worked with a rancher's fire relief committee that delivered 1,500 tons of hay, nearly 14,000 fence posts and 450 rolls of wire to help fire victims. Extension offered education for ranchers on beef herd health and nutrition, forage/range management, reproduction management and other best management practices to help them recover from the fire and protect the fragile hills as grass grew back.

Economic Development and Quality of Life for People and Communities

Topic: Building Nebraska Families

Issue: (Who cares and why?)

For people transitioning from welfare to work, economic self-sufficiency takes more than getting a job. Learning to manage money, improve parenting skills and balance work and family responsibilities helps public assistance recipients succeed at home and at work without financial assistance.

What has been done?

In 1999, University of Nebraska Cooperative Extension collaborated with the Nebraska Department of Health and Human Services to develop the Building Nebraska Families program, a first-of-its-kind for the Cornhusker State. This program teaches life skills as people move from welfare to work. Two University of Nebraska Cooperative Extension educators have taught pilot program classes to more than 30 Nebraskans as they move from public assistance to the paid workforce.

Impact:

A single mother from Lincoln County credits the program with helping her learn to budget, make informed spending choices and improve her attitude toward work. She plans to earn a degree and get a higher-paying job so she can stop living paycheck-to-paycheck and secure a better future for her son.

Funding:

Nebraska Department of Health and Human Services grant
NU Cooperative Extension

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Summary:

For people transitioning from welfare to work, economic self-sufficiency takes more than getting a job. In 1999, University of Nebraska Cooperative Extension collaborated with the Nebraska Department of Health and Human Services to develop a program that teaches life skills to public assistance recipients as they begin working. A single mother from Lincoln County credits the Building Nebraska Families program with helping her learn to budget, make informed spending choices and improve her attitude toward work. She plans to earn a degree and get a higher-paying job to secure a better future for her son.

Economic Development and Quality of Life for People and Communities

Topic: Decisions Now/Tilling the Soils

Issue: (Who cares and why?)

Facing low livestock and commodity prices as well as other changes in rural Nebraska, ag producers are seeking ways to streamline their operations and supplement their income.

What has been done?

University of Nebraska Cooperative Extension developed a program targeted to help farmers and ranchers through financially troubled times. Decisions Now: Building Your Future involves three single-day workshops and on-site visits. Extension educators and instructors help producers set and reach family and farm/ranch business goals. Another program, Tilling the Soil of Opportunity, addresses longer-term agricultural changes and helps producers evaluate their operational goals. The 36-hour class helps producers analyze whether their entrepreneurial ideas for ag-related products would likely be profitable. Nebraska producers proposed businesses such as a direct-market purebred cattle dealer, outdoor outfitters and a you-pick produce operation.

Impact:

Decisions Now participants most often cited learning these concepts from the program: setting goals for their family and business, having good records for decision-making and improving communication with family members, suppliers and lenders. A Herman, Neb., couple credits Decisions Now with helping them streamline their operation, improving the likelihood they'll continue farming. In the Tilling the Soil program, nine of 10 businesses participating in an Arthur, Neb., pilot program completed a feasibility or full business plan as a result of taking the course. Arthur, population 128, is the only town in a sparsely-populated Sandhills county.

Funding:

Decisions Now:

University of Nebraska Cooperative Extension

Nebraska Department of Agriculture

Tilling the Soil:

USDA's Sustainable Agriculture Research and Education program

US WEST Foundation

University of Nebraska Center for Rural Community Revitalization and Development

NxLevel Training Network, University of Colorado-Denver

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Summary:

Low agricultural prices and longer-term changes in the agricultural economy are leading producers to seek ways to boost their operations' efficiency and supplement their incomes. Two University of Nebraska Cooperative Extension programs address these issues. Decisions Now: Building Your Future workshops help producers set family and farm/ranch business goals, analyze cash flow and develop risk management strategies. Participants say the three single-day sessions and on-site visits by farm/ranch mentors help them set goals, keep good records and improve communications. Extension's Tilling the Soil of Opportunity helps producers evaluate their current agricultural operations and develop business plans for ag-related ventures. After completing the 36-hour class, nine of 10 Arthur County participants had completed plans that showed how their businesses would make money.

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, ages 4 to 18, with activities in schools, day camps, child care, civic groups, 4-H and other organizations. The national program, originally developed by the Josephson Institute of Ethics, teaches trustworthiness, respect, responsibility, fairness, caring and citizenship as the six pillars of character. Age-appropriate games, role playing, discussions and examples make these character concepts understandable.

In the past four years, 1,900 Nebraska youth and adults have been trained to teach Character Counts! and 31,000 children received 15 hours of Character Counts! educational programming in their classrooms. The curriculum reached another 128,000 kids through one-time exposure at day camps, the Nebraska State Fair and civic groups. More than 700,000 adult Nebraskans have learned about Character Counts! indirectly through radio, television and other sources.

Impact:

Nearly half of all Nebraskans have participated in some Character Counts! event since 1996, when the program began in the state. More than 80 percent of the teachers and facilitators who use the program report an overall positive experience in children they teach. Behavior changes include children being more helpful to others, more truthful and less likely to blame others. The program also influences adults -- 75 percent of teachers and facilitators responding to a survey said they changed their own behavior as a result of the training.

One elementary school counselor wrote: "The students in our school are seen as being more caring towards others and respectful in their play. We have noticed a decrease in playground conflicts and much fewer office referrals. Our teachers also like the common terminology and use the lessons for reinforcement of their classroom and playground rules. I would strongly encourage any person who is considering the Character Counts! program to begin the program as soon as possible. This program is one that works and will benefit the children for the rest of their lives."

Funding:

NU Cooperative Extension
Smith-Lever 3(d)

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Summary:

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. Teachers and facilitators report changing their own behavior as a result of the training, and that children have less playground fighting and fewer office visits. Nearly half of all Nebraskans have participated in some Character Counts! event since 1996, when the program began in the state.

Economic Development and Quality of Life for People and Communities

Topic: Women in Agriculture Conference

Issue: (Who cares and why?)

Women long have been silent partners on Nebraska farms and ranches, even while making marketing decisions, managing farm budgets or working with lenders and tending to family needs. More knowledge means more confidence and more choices for these farm women to do a better job and feel better about themselves, their families and their operations.

What has been done?

University of Nebraska Cooperative Extension's Women in Agriculture conference is designed primarily as a fall pre-harvest pick-me-up. It also provides a chance to learn more about marketing, personality and personnel issues, farm budgets, and legal issues such as taxes. The conference has been staged annually for 15 years and organizers believe it is the longest running of its kind in the nation. An average of 375 attend annually. Some women return each year, about half at the sponsorship of their lending institutions.

In western Nebraska in 1999, another extension effort, The Critical Difference: Rural Issues for Women conference, drew 116 people. This conference was designed to help women feel empowered to address issues important to them.

Impact:

Since 1984, 5,600 people from Nebraska and other states have attended the Women in Agriculture conference. In 1999, 111 lenders sponsored 291 of the 468 participants. The morale boost participants get from the education, friendships and sharing with others is priceless to many. Women call the conference a life preserver, a vacation, a refresher and energizer. One western Nebraska ag woman wrote: "I came here very discouraged and depressed. It helped to hear some positive points to ponder and to help me get out and make a difference to my family farm. It was a great experience and I will recommend it to others highly."

Of 75 participants completing evaluations of the Critical Difference: Rural Issues for Women conference in western Nebraska in 1999, nearly 30 percent said they learned more about marketing issues. More than 20 percent learned more about record keeping, budgeting, banking and financial ideas. Twelve percent said they became inspired enough from this conference to diversify family income through writing children's books and other entrepreneurial ventures.

Funding:

Smith-Lever 3(b) & (c)

Smith-Lever 3(d)

Lending institutions

User fees

University of Nebraska Cooperative Extension

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Summary:

Fall harvest is the most stressful time of year for farming operations and women often bear much of that stress. The University of Nebraska Cooperative Extension's Women in Agriculture conference has given many farm woman a fall boost during the last 15 years. The annual conference is the longest-running of its type and attracts an average of 375 women per year. The conference has had 5,600 participants since 1984, many of them repeats. The conference's main purpose is to offer humor and build self-confidence, but participants learn information on marketing, budgets, taxes and entrepreneurial opportunities. At least half of the women attend the conference compliments of their lending institutions. "With prices we are receiving for our crops and cattle we get the feeling maybe there is no hope, but we get here and you get a different feeling ... yes, we can master a plan for all of this," wrote one central Nebraska participant. Wrote another: "This is my shot of good medicine every year."

Summary:

The Critical Difference: Rural Issues for Women, a western Nebraska conference, drew 116 women in 1999. University of Nebraska Cooperative Extension staff spearheaded this conference to help empower women to address issues important to them. Of 75 participants completing conference evaluations, nearly 30 percent said they learned about marketing issues. More than 20 percent learned more about record keeping, budgeting, banking and financial ideas. Twelve percent said they became inspired enough from this conference to diversify family income through writing children's books and other entrepreneurial ventures.

Economic Development and Quality of Life for People and Communities

Topic: Juvenile Diversion

Issue: (Who cares and why?)

The legal system is becoming overburdened. Young people who commit misdemeanor crimes need to understand the consequences of their actions so they aren't repeated, without being hardened or traumatized by the legal system.

What has been done?

University of Nebraska Cooperative Extension's juvenile diversion programs help strengthen the life skills of young offenders and increase the likelihood that they will not reappear in court. In most programs, a parent or adult guardian must accompany the youth to all sessions. Program content typically focuses on character education, youth leadership, mentoring, tobacco prevention and 4-H involvement. Often, parents and youth build a project together. In some cases, this is the first joint activity for parents and their children. More than 400 youth have participated in this program since 1989 as an alternative to the conventional court system.

Impact:

The program and the process of building a project together help bond a caring adult with a young misdemeanor offender, who in many cases simply made a bad choice. Judges like the program because it keeps these youth out of their courts. The recidivism rate for youth participating in this program is nearly 20 percent lower than the national average. The program also has saved Nebraska courts \$170,000.

Funding:

Smith-Lever 3(b) & (c)
Nebraska Crime Commission
In-kind contributions from city and county agencies
NU Cooperative Extension

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Summary:

More than 400 Nebraska youth have participated in Cooperative Extension's juvenile diversion program during the last 10 years. The program involves youth and a parent or guardian in an educational program focusing on helping the youth understand why the crime committed was inappropriate and not to be repeated. The program has saved more than \$170,000 in court system costs. The recidivism rate for youth participating in the diversion program is nearly 30 percent lower than the national average.

Economic Development and Quality of Life for People and Communities

Topic: 4-H Public Speaking

Issue: (Who cares and why?)

Most people dread speaking before a group, yet effective public speaking is a lifelong skill critical to succeeding in many jobs.

What has been done?

Public speaking and demonstrations long have been a part of Nebraska Cooperative Extension's 4-H program. Public speaking contest preparation and competition help 4-H'ers learn to organize their thoughts, think on their feet and communicate effectively. Hundreds of Nebraska 4-H'ers participate in public speaking and demonstration contests annually, and many go on to national competition. To assess the long-term impact of participating in 4-H public speaking, extension recently surveyed 58 public speaking contest alumni from 11 Nebraska counties who graduated from high school between 1988 and 1993.

Impact:

Surveyed alumni said skills learned in public speaking have served them well in their careers. One respondent said he uses his 4-H speech skills daily as an insurance sales representative. Specifically, 95 percent said their demonstrations/public speaking experience increased their self-confidence and 94 percent said it enhanced their ability to express themselves.

One former 4-H'er from western Nebraska, who is now pursuing a graduate degree, said: "Public speaking was the foundation for everything. It encompasses everything I do. My success is attributed to public speaking."

Funding:

NU Cooperative Extension

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Summary:

Speaking before a group terrifies many people, yet good communications skills are important to succeed in many professions. University of Nebraska Cooperative Extension's 4-H public speaking and demonstration projects teach lifelong communication skills. Alumni of this 4-H program report that skills learned in 4-H public speaking have served them well in their careers. In a survey of 58 4-H public speaking/demonstration contest alumni, 95 percent said their 4-H experience increased their self-confidence and 94 percent said it enhanced their ability to express themselves. They also said they gained skills that help them better handle pressure, be organized, express ideas, think critically and make decisions. One former 4-H'er said public speaking is the foundation of everything she does.

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 provide the course instruction which helps Nebraskans who want to start a business or business owners who plan to expand or sell their businesses. Training includes a nine-week feasibility study, 10-week agricultural and 12-week business plan development courses.

Participants say the program provides them with efficient and practical business techniques, such as how to evaluate product lines, pricing structures and suppliers of raw materials. Participants also learn skills for conducting their own cash flow analysis, which is critical to the longevity of any business.

Impact:

Since the program began in 1993, EDGE participants have created more than 500 full-time jobs in Nebraska. Enrollees in the 1998-99 training year alone created the equivalent of 59 full-time and 19 part-time jobs in small towns around Nebraska.

A 1999 participant said her Nebraska EDGE business plan helped convince a local bank to give her a loan to remodel a building in Wayne, Neb., into a coffeehouse. Another said he learned the importance of budgeting and projecting cash flow and said the EDGE program "... kept us from closing our doors."

Funding:

NU Cooperative Extension
US WEST Foundation
Nebraska EDGE Coalition
Nebraska Department of Economic Development
USDA Rural Development program
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 includes a nine-week feasibility study, 10-week agricultural and 12-week business plan development courses. Since the program began in 1993, EDGE participants have created more than 500 full-time jobs in small towns around Nebraska. A 1999 participant said the EDGE program "... kept us from closing our doors."

Economic Development and Quality of Life for People and Communities

Topic: Building Family Friendly Communities -- Dawson County

Issue: (Who cares and why?)

When a meat-packing plant opened in the central Nebraska town of Lexington in 1990, local leaders knew a host of new services would be needed for non-English speaking workers who would move to the area to work at the plant. University of Nebraska Cooperative Extension has worked with the community to help integrate more than 2,000 Hispanics into the community.

What has been done?

Extension has developed relationships and partnerships with new residents through new Building Family Friendly Communities programs. Some of the offerings include cultural dance groups, 4-H clubs, volunteer training for Hispanic adults, teen leadership, parenting classes, community gardening, leadership institute, networking outside the family and computer literacy classes at the local public library in both English and Spanish.

Impact:

New 4-H clubs and programs for Hispanic residents allow them to continue their cultures, pride and heritage in their new community. A survey of a dozen Hispanic teens in one leadership group showed more than half now volunteer at least one hour per week and have improved self-esteem, while nearly all have a good role model outside the home and have developed specific personal goals.

Funding:

USDA State Strengthening Grant
NU Cooperative Extension

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Summary:

When 2,000 Hispanics moved to Lexington to work at a new beef processing plant beginning in 1990, University of Nebraska Cooperative Extension worked with the community to meet newcomer needs. The result is the formation of new 4-H clubs, as well as a leadership institute, and programs on networking, computer literacy and gardening. A survey of 12 Hispanic teens in one leadership group showed more than half now volunteer at least one hour per week and have improved self-esteem, while nearly all have a good role model outside the home and have developed specific personal goals.

Economic Development and Quality of Life for People and Communities

Topic: Building Family Friendly Communities -- Thurston County

Issue: (Who cares and why?)

Northeast Nebraska's Thurston County is home to the Winnebago and Omaha Native American tribes. Like tribes in many other parts of the country, they face social, economic and personal challenges.

What has been done?

Through a Nebraska State Strengthening grant, University of Nebraska Cooperative Extension launched a Building Family Friendly Communities program to provide new ways for Native Americans to participate in its programs. Activities include a teen improvisational theater troupe, a park landscape improvement project, computer lab access and computer training, teen peer mediation program, environmental school projects, and leadership programs for youth and adults. The teen improv troupes have performed across Nebraska and in other states, giving youth confidence in life skills such as pride, leadership, public speaking, responsibility and respect -- in some cases for the first time.

Impact:

Of 13 youth surveyed who participated in various strengthening grant activities, 92 percent said they are proud of their heritage since becoming involved with these activities; the number of these students who see themselves as a positive role model has more than doubled since becoming involved with the activities. More than half now have personal goals and nearly half have found ways to save time and energy by planning ahead.

Funding:

USDA State Strengthening Grant
University of Nebraska Cooperative Extension

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Summary:

University of Nebraska Cooperative Extension is offering new ways to reach Native American people in northeast Nebraska, thanks to a Building Family Friendly Communities program. Activities include a teen improvisational theater troupe, a park landscape improvement project, computer lab access and computer training, teen peer mediation program, environmental school projects, and leadership programs for youth and adults. In the improvisational theater troupe alone, more than 25 Native American teens have performed scenes throughout the state and nationally about social issues affecting youth and families. Of 13 teens surveyed who participated in these activities, more than half now see themselves as a positive role model, compared to less than one-fourth prior to the activities. More than half now have personal goals and nearly half have found ways to save time and energy by planning ahead.

Economic Development and Quality of Life for People and Communities

Topic: Food Processing Center

Issue: (Who cares and why?)

Turning Nebraska's vast livestock and crop production into processed foods here at home, instead of shipping raw commodities elsewhere for value-added processing, is vital to enhancing the state's economy. Entrepreneurs and established food processors alike get help adding that value from the University of Nebraska's Food Processing Center.

What has been done?

NU's Food Processing Center was the first of its kind when it opened in 1983 to offer a wide range of technical and marketing/business development assistance to entrepreneurs and established food processing firms in Nebraska, nationally and internationally. It has become a model for other universities. It's a one-stop source of food safety, problem-solving, product development and technical and business information for food processors.

For example, the center's Entrepreneur Assistance Program includes a series of workshops and services for people interested in starting a food processing company. The program covers business, marketing and manufacturing issues important to new business success. Another program, the Nebraska Custom Processing Network, matches Nebraska food processors that have excess plant capacity with companies that need custom or contract production. This linkage helps both 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.

Impact:

Nebraska's food processing industry has grown from 220 food processing businesses when the center opened to nearly 400 today. 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.

Center staff estimate the Entrepreneur Assistance Program saves participating entrepreneurs about \$20,000 in food business startup costs. Since the program began in 1989, 71 percent of participants that started food businesses remain in business today, a high percentage for this competitive industry. The 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
Hatch Act
NU Cooperative Extension
NU Agricultural Research Division

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Summary:

Turning Nebraska's meat, poultry and grains into value-added processed foods helps the state's economy. The University of Nebraska's Food Processing Center offers a wide range of technical and marketing/business development assistance to entrepreneurs and established food processing firms in Nebraska, the nation and the world. Nebraska's food processing industry has grown from 220 food processing businesses when the center opened in 1983 to nearly 400 today. Food Processing Center officials estimate 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 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: Nebraska Rural Poll

Issue: (Who cares and why?)

Understanding rural Nebraskans' views, needs and concerns is important to effective public policy and planning. The University of Nebraska's annual Nebraska Rural Poll provides a snapshot of rural views, and tracks trends and changes in rural attitudes and behaviors over time.

What has been done?

The annual poll, launched in 1996 by NU's Center for Rural Community Revitalization and Development, surveys the opinions of about 7,000 randomly selected Nebraskans in the state's 87 rural counties. The mail survey asks rural Nebraskans about issues ranging from community and individual well-being to work and current policy issues. It's one of the largest surveys of its kind in the country. NU Institute of Agriculture and Natural Resources researchers analyze poll results to provide a rural perspective on a range of issues. Analysis quantifies how rural Nebraskans as a whole and by group view different issues. For example, 34 percent of respondents to the 1999 Nebraska Rural Poll said educational quality greatly decreased or decreased in their local schools after state aid formulas changed.

Impact:

In the short run, the poll provides a glimpse at rural views on important, sometimes controversial issues. Over time, it tracks changes and trends in rural Nebraska, providing a clearer big-picture understanding of all of Nebraska. Federal, state and local policy-makers, lawmakers and rural communities use such scientific poll results to help with planning and decision-making. Policy-makers say the poll gives them a realistic picture of rural Nebraskans' needs and puts a human face on the state's rural residents.

Funding:

NU Cooperative Extension
NU Agricultural Research Division
Partnership for Rural Nebraska
Smith-Lever 3(b) and (c)
Hatch Act

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Summary:

Since 1996, the Nebraska Rural Poll has tracked rural Nebraskans' views, helping frame a broader picture of trends, attitudes, opinions and concerns and giving rural Nebraskans a voice. Federal, state and local policy-makers, lawmakers and rural communities use such results to help with planning, policies and decision-making. The poll is one of the nation's largest surveys of rural residents. The University of Nebraska's Center for Rural Community Revitalization and Development conducts the poll in cooperation with the Partnership for Rural Nebraska and the Institute of Agriculture and Natural Resources' Cooperative Extension and Agricultural Research divisions.

Economic Development and Quality of Life for People and Communities

Topic: Drought Monitoring

Issue: (Who cares and why?)

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

What has been done?

University of Nebraska researchers at the National Drought Mitigation Center helped develop a new drought tracking system, which the White House unveiled in August 1999 as part of efforts to aid the drought-plagued Northeast states. The Drought Monitor is an easily understood, web-based tool for tracking widespread droughts. Frequent updates highlight emerging trouble spots so state and federal agencies can take steps to reduce drought's impacts. The Drought Monitor combines several drought and water indices in a single, simple map showing where drought is emerging, lingering or subsiding nationwide. NU researchers collaborated with USDA and the National Oceanic and Atmospheric Administration on this project and the Nebraska team maintains the web site.

Impact:

The Drought Monitor is among the latest products of efforts to improve drought monitoring nationwide and characterize its severity. State and federal agencies are using the monitor to coordinate drought planning and response, which ultimately should help reduce society's vulnerability to drought.

Funding:

USDA

National Oceanic and Atmospheric Administration

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 National Drought Mitigation Center, based at NU, teamed with scientists at two federal agencies to develop the Drought Monitor, an easy to understand, 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. The Drought Monitor was launched last summer. It's the result of efforts to better monitor and characterize its severity to improve drought planning and coordination.

Economic Development and Quality of Life for People and Communities

Topic: Pennington Seed

Issue: (Who cares and why?)

The fate of promising new alternative crops hinges on finding markets. If farmers can't sell the newcomer, it's not worth the ground it grows on. To create a value-added market for several alternative crops and aid community economic development, University of Nebraska faculty worked with Cheyenne County to attract a grass and birdseed company to Sidney, Neb.

What has been done?

As part of a long-term commitment to developing alternative crops for Nebraska's Panhandle, NU Institute of Agriculture and Natural Resources researchers over the years developed a proso millet breeding program and tested sunflower and safflower varieties. This led to varieties that are particularly well-suited to the region and laid the scientific groundwork for expanded birdseed production. In addition to crop development and feasibility studies, IANR research and Cooperative Extension staff met with owners of the Pennington Seed Co. and worked with Cheyenne County economic development staff to provide background information on these crops and the region's ability to produce them. The company opened its Sidney processing plant in the mid-1990s.

Impact:

This plant has created new jobs and economic activity for Sidney and provides a new, value-added market for farmers. It's estimated that birdseed production in Nebraska's Panhandle has increased by more than 100,000 acres since the plant opened. With a gross return of \$100 per acre, that additional acreage translates to a new market worth \$10 million annually. Integration of proso millet and sunflowers into the region's dryland cropping rotation also helps stabilize financial return for Panhandle farmers by diversifying their crop base.

Funding:

Hatch Act
Smith-Lever 3(b) & (c)
NU Agricultural Research Division
NU Cooperative Extension

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Summary:

To create a value-added market for several alternative crops and aid community economic development, University of Nebraska worked with Cheyenne County to attract Pennington Seed Co., a grass and birdseed company, to Sidney, Neb. Earlier NU Institute of Agriculture and Natural Resources research led to proso millet, sunflower and safflower varieties that perform well in the region and laid the foundation for expanded birdseed production. In addition to crop development and feasibility studies, IANR research and extension staff met with seed company owners and provided Cheyenne County economic development staff with information on these crops and the region's ability to produce them. Since the Pennington Seed Co. plant opened in the mid-1990s, Panhandle birdseed production has increased by about 100,000 acres, which translates into a new market worth \$10 million annually. These new crops help Panhandle farmers diversify their crop base; the plant provides jobs and other economic benefits to the community.

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 freshmen 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 freshmen students in one dorm on UNL's East Campus where they are surrounded by other freshmen 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 enrollment totaled 55 students in the 1998-1999 school year.

Impact:

Ninety-three percent of ACE participants who were freshmen in spring 1998 returned as sophomores in fall 1999, compared to a UNL-wide retention rate of 79 percent during the same period.

Funding:

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

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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 freshmen succeed academically and socially so they stay in school. Housing freshmen with similar interests together, providing tutoring and other support services and teaching students to become campus and community leaders led to retaining 93 percent of ACE participants from spring 1998 to fall 1999. The UNL-wide retention rate for the same period was 79 percent.

Society-Ready Graduates

Topic: Beef Team

Issue: (Who cares and why?)

In an era of time-starved consumers, many U.S. shoppers don't know how to select and cook beef cuts from the meat case. They may buy less beef or purchase only the best-known cuts, such as steaks.

What has been done?

To help consumers learn about beef while they are shopping, the University of Nebraska joined with the state's beef industry to establish the student-driven Nebraska Beef Team. The team of 15 College of Agricultural Sciences and Natural Resources students is trained to educate customers about beef right at the meat counter. Team members set up information booths near urban supermarket meat counters, where they answer shoppers' questions, explain uses for different beef cuts, suggest money-saving tips and offer recipes, cooking and nutrition information. The team is a joint effort of NU's Institute of Agriculture and Natural Resources, the Nebraska Beef Council, the Cuming County Cattle Feeders and Harry Knobbe, a West Point beef producer who conceived the idea.

Impact:

The Nebraska Beef Team was the first of its kind in the nation and has become a model for other states. Team organizers have trained students at Ohio State University and the University of Tennessee. Student members are building communication skills while helping shoppers develop beef loyalty. Feedback from customer comment cards gave the program high marks. On a 5-point scale, over 100 shoppers rated the professionalism of the Nebraska Beef Team member who helped them at 4.8, the quality of recipes and information at 4.8 and the program's value at 4.5.

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 is made up of College of Agricultural Sciences and Natural Resources students extensively trained to educate consumers about beef. 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 becoming a national model and team organizers have trained Beef Teams at two other land-grant universities. Team members offer new beef recipes and make suggestions, help consumers select beef and answer any beef-related questions. Students say they gain communications skills that prepare them for job interviews and the workplace. Customers give the program high marks.

Society-Ready Graduates

Topic: HRFS Master's

Issue: (Who cares and why?)

Most Americans feel time-crunched, but distance poses an additional barrier for rural residents seeking advanced college degrees. Facing long drives to the nearest college or university besides juggling work, family and community responsibilities, many rural residents put their educational dreams on hold.

What has been done?

The University of Nebraska's College of Human Resources and Family Sciences' extended education program bridges barriers of distance, time and students' personal commitments, enabling them to earn a master's degree miles from the main campus. Launched in 1994 with satellite delivery and a toll-free number for class discussions, the program moved to World Wide Web-based instruction in 1999.

The extended education effort expanded in 1999 with the addition of a master's degree program in textiles, clothing and design. Nebraska and six other universities also will offer an inter-institutional master's degree program in family financial planning starting in fall 2000.

Impact:

Forty-one University of Nebraska students earned master's degrees through the three-year program since 1997 without stepping foot in a campus classroom. One Nebraska farm widow was able to complete the program while managing the farm and raising her family. The advanced degree allowed her to work for a salary rather than the \$5.75 per hour she earned at a part-time job. Originated to offer university educational opportunities for place-bound rural Nebraskans, the program has expanded worldwide with students from 25 U.S. states, France, Guam and Thailand now enrolled.

Funding:

NU College of Human Resources and Family Sciences

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Summary:

The University of Nebraska's College of Human Resources and Family Sciences offers a World Wide Web-based extended education program that bridges barriers of distance, time and students' personal commitments. Forty-one students have earned their master's degrees without stepping foot on the main campus, including one Nebraska farm widow whose advanced degree helped her move from a \$5.75 per hour part-time job to a salaried position. A master's degree in clothing, textiles and design was added in 1999 and NU teamed with six other universities to offer a master's program in family financial planning starting in fall 2000.

Society-Ready Graduates

Topic: Transfer Agreements

Issue: (Who cares and why?)

Finding qualified people to fill jobs is a major economic development issue in Nebraska, which has among the nation's lowest unemployment rates. The University of Nebraska College of Agricultural Sciences and Natural Resources' transfer program encourages Nebraskans to stay in-state for their education.

What has been done?

The college, part of NU's Institute of Agriculture and Natural Resources, has instituted transfer agreements with 14 post-secondary colleges and universities in Nebraska and Iowa. These agreements encourage smooth transitions for students transferring to Nebraska's only undergraduate and graduate college of agriculture and natural resources to further their educations. Upon graduation, many students stay in Nebraska to seek their first jobs.

Impact:

In the 1998-99 academic year, 409 students earned bachelor's, master's or doctorate degrees from the college. Among 195 graduates polled, more than 70 percent stayed in Nebraska. Most of those remaining in the state cited multiple reasons for staying. Proximity to family, friends, a spouse or significant other topped the list, followed by liking Nebraska's quality of life.

Funding:

NU College of Agricultural Sciences and Natural Resources

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Summary:

Finding qualified people to fill jobs is a major economic development issue in Nebraska, which has among the nation's lowest unemployment rates. The University of Nebraska College of Agricultural Sciences and Natural Resources' transfer program encourages Nebraskans to stay in-state to attend Nebraska's only undergraduate and graduate college of agriculture and natural resources. The college offers transfer agreements with 14 post-secondary colleges and universities in Nebraska and Iowa, encouraging smooth transitions for students transferring to NU. Among 196 graduates polled in 1998-99, more than 70 percent said they would work in Nebraska.

Society-Ready Graduates

Topic: CASNR Economic Impact

Issue: (Who cares and why?)

Keeping talented graduates of the University of Nebraska's College of Agricultural Sciences and Natural Resources in the state enriches the state intellectually and adds value to Nebraska's economy, making it a smart taxpayer investment.

What has been done?

The college provides Nebraska's only comprehensive undergraduate and graduate academic programs in agricultural sciences and natural resources. Enrollment in undergraduate and graduate programs was 1,571 students in 1998-1999.

Impact:

In 1997-98, 71 percent of College of Agricultural Sciences and Natural Resources graduates landed their first jobs in Nebraska. Based only on their starting salaries, these graduates contributed over \$10 million during their first year of work to Nebraska's economy. The figure represents over twice what taxpayers pay toward the college budget each year.

Funding:

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Summary:

Nebraska taxpayers get their money back and more from graduates of the University of Nebraska's College of Agricultural Sciences and Natural Resources. In 1997-98, 71 percent of the college's graduates stayed in Nebraska. Based only on their starting salaries, CASNR graduates contributed over \$10 million during their first year of work to Nebraska's economy. The figure represents over twice what taxpayers pay toward the CASNR budget each year.

Society-Ready Graduates

Topic: Beef Home Study Courses

Issue: (Who cares and why?)

Nebraska is second nationally in cattle and calf production. To stay competitive cattle producers need the latest information on beef nutrition, health care, market and industry trends, research and reproduction. University of Nebraska Cooperative Extension brings education home with courses producers can take on their own schedules.

What has been done?

"Beef Cow Basics," a series of home-study courses taught from the rancher perspective, offers money-saving information to novices as well as fourth-generation producers. More than 4,500 courses have been distributed to producers in more than 40 states, plus Bosnia, Mexico and Brazil, since 1993. Course offerings are fine-tuned based on participant feedback; business and personnel management was added recently and an advanced herd nutrition course is being piloted.

The Nebraska home study course has the potential to take off in new directions — and has. In South Dakota, for example, the Farm Service Agency has approved the Nebraska-based home study course to meet lending requirements. It also is an approved course offering by Oglala Lakota College sites across South Dakota's Pine Ridge and Rosebud Indian reservations. Other states have patterned beef and sheep home study courses after Nebraska's beef home study, and one state is exploring the option of patterning a bison management course after it.

Impact:

A recent survey of 165 participants shows beef producers reduced costs an average of \$15 per head after taking the course. Since the course began in 1993, the overall benefit has exceeded \$6 million, based on the number of cows involved.

More than 90 percent of respondents said they would make management changes because of the course. "I've seen a lot of changes in the ranching business and I believe that keeping abreast of the new technologies, as well as being refreshed in the basics, is just as important in the ranching business as it is in any other occupation," said a third-generation Nebraska rancher. Another participant reported cutting calf sickness in half by changing his operation's feeding and health program based on course information. One hearing-impaired producer, who especially appreciated the chance to learn more about his business at home, noted the courses have the right mix of lay terminology and technical terms to be interesting and informative.

Funding:

User fees

NU Cooperative Extension

Smith-Lever 3(b) and (c)

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Summary:

Beef Cow Basics, a University of Nebraska Cooperative Extension home study course, lets cattle producers learn the latest beef nutrition, health care, marketing and food safety information at home on their own schedules. The program, first offered in 1993, has been so successful that several other states have patterned their beef and sheep programs after it. More than 4,500 courses have been distributed to producers from more than 40 states, Bosnia, Mexico and Brazil. Organizers estimate that this course saves producers about \$15 per head. That's a production savings for all participants of more than \$6 million, based on the number of cattle involved.

