APPENDIX I

Impact 2003 Report

About this project: These impact statements represent 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. Writers in IANR's Communications and Information Technology unit prepared these impacts in cooperation with IANR faculty and administration. These are deliberately brief, focused on public benefits and written to be easily understood by non-scientists to meet database and audience needs. A single-paragraph summary follows each impact statement. The main impact statements were submitted to the national database. The single-paragraph summaries were written for local use, primarily in communications/marketing efforts on behalf of IANR's programs. This is not a comprehensive listing of IANR accomplishments, but highlights some ongoing efforts. The national impact database contains previous years' submissions and is on the Web at: http://www.reeusda.gov/success/impact.htm. This year's database is expected to be open for public use by late spring 2003.

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Society-Ready Graduates

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** Denotes an update of an impact statement used in 2002.*

Competitive Agricultural Systems in a Global Economy
Topic: Biosecurity Education

Issue:
Disease outbreak – by accident or because of bioterrorism – could devastate Nebraska's $6 billion a year livestock industry. Awareness and caution are among the best biosecurity safeguards but veterinarians and producers need to understand how best to prevent or contain diseases.

What has been done?
University of Nebraska veterinarians are developing a new biosecurity education program with help from a $250,000 federal grant. The biosecurity curriculum primarily trains veterinarians, NU Cooperative Extension specialists and veterinary students to help livestock producers use biosecurity production practices. NU's biosecurity effort is multifaceted and includes Web-based information. Extension also coordinates disease prevention training and publications for livestock producers and youth. Training for food processors teaches awareness of potential bioterrorism and details preventative measures to minimize risks to the food supply. As part of this effort NU veterinarians also are investigating ways to prevent bovine viral diarrhea, Johne's disease, foot-and-mouth disease and the more common calf scours in Nebraska livestock.

Impact:
This training has helped at least 1,460 Nebraska livestock producers and food processors guard against intentional or accidental biosecurity threats and is greatly expanding the number of people on the lookout for such problems. This is especially important in Nebraska, a leader in livestock production. This preparation should help spot problems early and control the spread of livestock diseases.

Funding:
NU Cooperative Extension
USDA Higher Education Challenge grant
Smith-Lever 3(b) & (c)

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Summary:
Awareness and caution are among the best defenses against intentional or accidental livestock disease threats. NU Cooperative Extension is heading a biosecurity training effort to safeguard Nebraska's $6 billion livestock industry. This program teaches veterinarians, producers, youth and others how to prevent or contain disease outbreaks spread accidentally or through bioterrorism. A new Web site, meetings and publications are part of the effort, funded by a $250,000 USDA grant. NU's training programs for food processors also emphasize biosecurity and preventative measures to minimize risks to the food supply. This training has helped at least 1,460 Nebraska livestock producers and food processors guard against intentional or accidental biosecurity threats and is expanding the number of people on the lookout for such problems.

Competitive Agricultural Systems in a Global Economy
Topic: Calf Scours Prevention System

Issue:
Diarrhea, or scours, is a leading cause of illness and death in beef calves. In some herds, nearly all young calves get scours and 5 percent to 10 percent die of scours-related illness. Treatment and performance and death losses can cost individual ranchers thousands of dollars annually.

What has been done?
University of Nebraska veterinary scientists designed a calving system to reduce calf scours on ranches in the Nebraska Sandhills. Their system reduces calf exposure to the germs that cause scours by keeping older and younger calves in separate pastures and by moving pregnant cows to new calving areas where their calves are born in pastures free of scours-causing germs. This system significantly reduced calf illness and treatment costs and eliminated calf deaths from scours in tests on two Sandhills ranches under different calving schemes. For example, one 900-head ranch that lost 7 percent to 14 percent of its calves to scours before adopting the NU system had no scours deaths since. On the same ranch, four calves were treated for scours in 2000 and none were treated in 2001 and 2002. Because few calves developed scours, ranchers also greatly reduced use of antibiotics needed to treat sick calves. The team now is teaching veterinarians and ranchers how to adopt this scours prevention strategy.

Impact:
Ranchers who have adopted this system report significantly reducing calf sickness, death and antibiotic use. The system also aids labor efficiency, a major issue during busy calving season, because cattle movement can be scheduled when labor is available. The owner of the 900-head ranch estimates savings of $40,000 to $50,000 annually since implementing the calving system because he has more calves to sell, improved calf performance and greatly reduced treatment costs.

Funding:
NU Agricultural Research Division
NU Cooperative Extension Division
Hatch Act
Pfizer Animal Health
Sandhills Veterinary Hospital
Smith-Lever 3(b) & (c)

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Summary:
Calf scours, or diarrhea, is a leading cause of death and sickness in beef calves but Sandhills ranchers have a new tool to combat this costly threat. NU Institute of Agriculture and Natural Resources veterinary scientists designed and successfully tested a calving system that greatly reduces scours outbreaks by managing cow-calf pairs and pregnant cows to minimize calf contact with scours-causing germs. Since few calves get sick, this system also greatly reduces the need for antibiotics. The owner of a 900-head herd estimates savings of $40,000 to $50,000 annually since implementing the calving system because he has more calves to sell, improved calf performance and greatly reduced treatment costs.

Competitive Agricultural Systems in a Global Economy

Topic: Center for Agricultural & Food Industrial Organization

Issue:
Policy debates surrounding the food industry often are driven more by consumer perceptions and emotions than facts. Research-based economic perspective is important to help assure sound policy decisions, particularly as globalization, industrialization and consolidation continue to change the industry.

What has been done?
The Center for Agricultural & Food Industrial Organization was created in 2001 to bring economic perspectives to public debates about competitive issues in the food industry. Comprising faculty from the University of Nebraska-Lincoln's departments of economics and agricultural economics, the center has researched issues such as: the effect of the Livestock Mandatory Reporting Act on livestock industry competition; the effect of Nebraska's Initiative 300 on the structure of Nebraska's cattle industry; the effects of biotechnology on concentration and structure in the agricultural inputs industry; and the market effects from the introduction of genetically modified food.

One of the center's most significant projects so far was a study of how increased concentration through consolidation in the food processing industry affected consumer prices. It showed that, while increased concentration resulted in enhanced efficiency gains and lower processing costs, it also resulted in levels of market power that more than outweighed the efficiency gains in most industries. Food prices went up in 24 of the sectors studied, down in four, and stayed unchanged in five. A Web site, http://agecon.unl.edu/cafio/homepage.html, provides easy access to the center's information.

Impact:
This center provides research-based information for policy debates about the food industry, forging a "new agricultural economics" that recognizes the ways concentration, industrialization and globalization are changing how food is produced, processed and marketed. With scholars from 11 countries represented on an editorial board that guides its new publication, Journal of Agricultural & Food Industrial Organization, the center puts NU at the center of food industry research internationally.

Funding:
NU Agricultural Research Division
National Research Initiative
Regional Research Project NE-165
USDA Cooperative State Research, Education and Extension Service
Grain Inspection, Packers and Stockyard Administration
USDA Economic Research Service

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Summary:
NU's Center for Agricultural & Food Industrial Organization was created in 2001 to bring economic perspectives to public debates about food industry issues. Comprising faculty from the University of Nebraska-Lincoln's departments of economics and agricultural economics, the Institute of Agriculture and Natural Resources center has researched more than a dozen issues in an attempt to forge a "new agricultural economics" that recognizes the ways concentration, industrialization and globalization are changing how food is produced, processed and marketed. With scholars from 11 countries represented on an editorial board that will guide its new publication, Journal of Agricultural & Food Industrial Organization, the new center puts NU at the center of food industry research internationally. Its Web site is http://agecon.unl.edu/cafio/homepage.html.

Competitive Agricultural Systems in a Global Economy
Topic: Chickpeas as an Alternative Crop

Issue:
Alternative crops help diversify producers' cropping options, but growing unfamiliar crops can be a challenge. Producers need information on how to successfully produce a new crop under local conditions before taking a risk on growing it.

What has been done?
To help Nebraska Panhandle farmers examine chickpea potential, University of Nebraska agricultural scientists have studied chickpea production for more than a decade. In cooperation with the High Plains Pulse Crop Association, NU Cooperative Extension staff have shared these findings with growers eager for information on this newcomer. On-farm trials provide information on disease and weed control, variety adaptation, row spacing, nutrient management and nitrogen needs. Researchers also identified some varieties that resist ascochyta blight, a damaging disease.

Impact:
Chickpeas, or garbanzo beans, are becoming another viable alternative crop in western Nebraska thanks largely to this effort. Five years ago, chickpeas weren't grown commercially in Nebraska. In the past three years, 10,000 acres of chickpeas were produced. Chickpeas could give farmers twice the gross return, compared with the area's traditional crops – wheat and proso millet. If they become more widely integrated into the Panhandle's crop rotation, chickpeas could boost grower income and perhaps create processing and related jobs.

Funding:
NU Agricultural Research Division
Hatch Act
NU Cooperative Extension
Nebraska Department of Agriculture USDA Specialty Crop Grant
Smith-Lever 3(b) & (c)

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Summary:
Chickpea, or garbanzo bean, production has increased recently in Nebraska's Panhandle, largely due to NU agricultural research and Cooperative Extension efforts. Institute of Agriculture and Natural Resources scientists have studied chickpea production for about a decade. Research results are providing information on how best to grow the newcomer under local conditions. This information is in demand as farmers inexperienced in chickpea production start growing this value-added crop. Five years ago, chickpeas weren't grown commercially in the Panhandle. In the past three years, thanks to IANR's efforts, 10,000 acres of chickpeas were produced. Chickpeas could give farmers twice the gross return, compared with the area's traditional crops – wheat and proso millet. If they become more widely integrated into the region's crop rotation, chickpeas could boost grower income and perhaps create processing and related jobs.

Competitive Agricultural Systems in a Global Economy
Topic: Drought Web Site

Issue:
The drought that gripped Nebraska in 2002 had a devastating impact on the state's agriculture-based economy while communities and homeowners struggled with water shortage. With the state facing continued drought, Nebraskans need easily accessible research-based information to help them make decisions about how to cope with drought.

What has been done?
In 2002, University of Nebraska Cooperative Extension worked with communications and technology specialists to develop a focused drought Web site that packages drought-related information in an easy-to-use format. The site – http://ianrhome.unl.edu/drought/ – includes drought-related news stories and newsletters from the Institute of Agriculture and Natural Resources, links to extension publications, television and radio programming, satellite conferences, other land-grant universities, national and state resources, weather information and more. Numerous state agencies link to the university site, which averaged about 1,000 visits a month during the last half of 2002.

Impact:
The drought caused more than $1 billion in agricultural losses in Nebraska in 2002. This site gives farmers, ranchers and others 24-hour access to the latest drought information from the university and elsewhere so they can make informed choices about their crops, livestock and water use. Such decisions ultimately affect the state's economy and water resources.

Funding:
NU Institute of Agriculture and Natural Resources
Smith-Lever 3(b) & (c)

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Summary:
The continuing drought has had a devastating impact on Nebraska's agriculture-based economy and its communities. Because unbiased, research-based information is a key in helping ag producers and others cope with drought, NU Cooperative Extension worked with communications and technology specialists to develop a drought Web site that packages drought-related information in an easy-to-use format. The site – http://ianrhome.unl.edu/drought/ – includes Institute of Agriculture and Natural Resources information, extension publications, radio and TV programming, and other drought-related resources across Nebraska and the nation.

Competitive Agricultural Systems in a Global Economy
Topic: Dry Ethanol Byproducts for Farms and Ranches

Issue:
Winter feed is Nebraska cow-calf producers' biggest expense. Anything that trims feed costs can be a major savings, especially during drought when hay supplies are limited and expensive.

What has been done?
University of Nebraska animal scientists studied the feasibility and economics of using dry ethanol byproducts instead of hay as a protein-energy supplement for cows and heifers in forage-based operations. Dried byproducts proved effective and economical. Using byproducts in dry instead of wet form is more practical for ranches and farms because they are easier to transport and feed and don't spoil as fast as wet byproducts, which are well-suited to and widely used in Nebraska feedlots.

Impact:
This research showed that feeding dried byproducts as a protein-energy supplement to heifers on winter range could save an average of 20 percent or more than $12 per head, compared with feeding hay. On a typical family operation with around 400 head of cattle, that potential savings translates to more than $4,800 per year or an average of $10 million statewide if all Nebraska cattle on rangeland were fed dry ethanol byproducts.

Funding:
NU Agricultural Research Division
Hatch Act

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Summary:
The best way for farmers and ranchers to take advantage of economical byproduct feeds from the state's ethanol industry is to use them in dry instead of wet form, NU animal science research shows. While wet byproducts work well for feedlots, researchers found that dried byproducts work best for operations where cows and calves primarily graze. Institute of Agriculture and Natural Resources studies showed that feeding dry byproducts as a protein-energy supplement to heifers on winter range reduced costs about 20 percent or more than $12 per head, compared with feeding hay. On a typical family operation with around 400 head of cattle, that potential savings translates to about $4,800 per year or an average of $10 million statewide if all Nebraska cattle on rangeland were fed dry byproducts.

Competitive Agricultural Systems in a Global Economy
Topic: Indoor Prawn Production

Issue:
Years of low prices and other uncertainties have reduced the number of Nebraska farmers who raise swine. In many cases, their hog barns stand empty. University of Nebraska researchers are exploring the potential for filling those barns with a new type of "stock" – prawns.

What has been done?
A University of Nebraska aquaculturist teamed with NU Cooperative Extension to explore the potential for growing freshwater prawns in heated tanks in vacant hog barns or other farm buildings. This research shows these hardy, shrimp-like crustaceans grow well indoors. Grown from larvae, they can be ready for market in six months or less. Analysis shows that Nebraska's abundant groundwater, feed resources and inexpensive public power to heat and aerate the tanks are ideal for prawn production. The university is patenting some specialized equipment researchers devised for indoor prawn production. NU extension is developing prawn production education programs.

Impact:
Demand for seafood is increasing and shrimp is the best-selling seafood in the world. The market is strong with the United States currently importing more than $3 billion worth of shrimp annually. Prawn production could be an additional or alternative income source for farmers and provide competitively priced fresh seafood for local markets. NU researchers estimate farmers could raise 10 to 12 pounds of prawns per 1,000 gallons of water annually in vacant livestock buildings. Prawns bring $6 to $10 per pound, depending on size and market prices.

Funding:
NU Agricultural Research Division
NU Cooperative Extension
Nebraska Soybean Board
UNL Water Center
UNL School of Biological Sciences
UNL College of Arts and Sciences
Smith-Lever 3(b) & (c)

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Summary:
Some Nebraska farmers may soon raise a new type of "stock" in unused hog barns or other farm buildings. University of Nebraska research shows freshwater prawns can be relatively easily raised in indoor tanks that could be located in empty farm buildings. The university is patenting some specialized equipment researchers devised for indoor prawn production. NU Cooperative Extension is developing educational programs on indoor prawn production. Raising prawns might provide additional or alternative income for some farmers. NU researchers estimate farmers could raise 10 to 22 pounds of prawns per 1,000 gallons of water annually in vacant livestock buildings. Prawns bring $6 to $10 per pound, depending on size and market prices.

Competitive Agricultural Systems in a Global Economy
Topic: National Drought Mitigation Center

Issue:
Drought is a natural but costly phenomenon. At its peak during 2002, more than half of the nation was in drought. Only droughts of the 1930s and late 1950s affected a greater percentage of the country. Nationwide drought costs were $10 billion to $20 billion.

What has been done?
The University of Nebraska's National Drought Mitigation Center helps regional governments and policy-makers reduce society's vulnerability to drought through risk management-oriented planning, assessment and information. Step-by-step drought planning tools developed by the NU Institute of Agriculture and Natural Resources climatologist who heads the center help governments to create drought plans. The U.S. Drought Monitor, a nationwide Web-based drought tracking tool, now is extensively used by officials, the media and the public. The map is updated weekly to track emerging trouble spots. NU researchers collaborated with USDA and the National Oceanic and Atmospheric Administration to introduce this tool in 1999. The center maintains the Drought Monitor Web site, which had 5 million visits in 2002. Building on its success, scientists plan to incorporate data from Canada and Mexico into a monthly North American Drought Monitor map in spring 2003.

The NDMC is collaborating with USDA's Risk Management Agency to develop better drought risk assessment tools for ag producers nationwide. The center's director is working with the Western Governors' Association and Congress on a drought preparedness bill. The center also helps many countries with drought issues and is working with the United Nations to develop regional drought preparedness networks worldwide. The center would co-lead this project.

Impact:
The center helps governments anticipate and minimize drought risks. Thanks in part to the center's work, drought planning efforts nationwide have shifted from a reactive crisis management to a proactive risk management approach. The number of states with drought plans continues to grow. By the end of 2002, 36 states had plans, including several revised to emphasize risk management, and three more were in the works. Many of those plans are based on the Nebraska-developed planning tools.

Funding:
USDA
National Drought Mitigation Center
NU Agricultural Research Division
Hatch Act

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Summary:
NU's National Drought Mitigation Center helps governments and policy-makers reduce society's vulnerability by anticipating and taking steps to minimize drought impacts. Drought planning tools developed by the Institute of Agriculture and Natural Resources climatologist who heads the center are widely used by governments to create customized drought plans. The Web-based U.S. Drought Monitor, which IANR scientists developed in cooperation with federal agencies, is widely used nationwide. The monitor's Web site, which the center maintains, had 5 million visits in 2002. Building on this success, researchers plan to incorporate data from Canada and Mexico into a monthly North American Drought Monitor map in spring 2003. The center's work has helped shift drought planning nationwide from reactive crisis management to proactive risk management; 36 states now have drought plans, many based on the NU-developed drought planning tools.

Competitive Agricultural Systems in a Global Economy
Topic: Republican River Basin Irrigation Management Project

Issue:
Irrigation water is at a premium in Nebraska's Republican River Basin. The region's surface water is limited by water use agreements with adjoining states and continued drought that has shrunk reservoirs and lowered groundwater levels. Farmers need to know how to make the most of the limited water available for crops.

What has been done?
University of Nebraska Cooperative Extension launched the Republican River Basin Irrigation Management Project to demonstrate crop yields under different irrigation timing and amounts. The goal is to increase water use efficiency for corn and soybeans by 5 percent over the next five years. In 2002, extension educators demonstrated corn's response to three water strategies – full, water miser and deficit irrigation. Full irrigation provided enough water to keep moisture stress from limiting yields. The water miser strategy focused on saving water during less sensitive vegetative growth stages and watering fully during critical reproductive growth. Under deficit irrigation, application of limited water is timed to maximize yields from water used. Plots also demonstrated ways to improve irrigation efficiency, reduce tillage and grow crops requiring less water.

Impact:
Reducing water use is especially important in the Republican River Valley but will continue to be significant across the Great Plains as demand for water increases. This project lets growers see firsthand how to sustain yields with less water. For example, the water miser strategy used 31 percent less water while reducing yields only 3 percent. The savings in pumping costs virtually offset yield loss.

Funding:
U.S. Bureau of Reclamation
NU Cooperative Extension
Smith-Lever 3(b) & (c)

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Summary:
Irrigation water is at a premium in Nebraska's Republican River Basin. Farmers need practical information about how to make the most of the limited water. NU Cooperative Extension launched the Republican River Basin Irrigation Management Project to show farmers and crop consultants how the timing and amount of water affect crop yields. Using information from this demonstration project, producers can produce nearly the same yields with less water. For example, the project showed that a water miser strategy used 31 percent less water but reduced corn yields only 3 percent. The savings in pumping costs virtually offset yield loss. The project's goal is to increase water use efficiency for corn and soybeans by 5 percent over the next five years.

Competitive Agricultural Systems in a Global Economy
Topic: Small Farm and Ranch Profitability Project

Issue:
Many small ranchers and farmers feel squeezed financially between mounting costs and the whims of commodity markets. Pursuing alternative markets can improve profits, but without solid market research and product development information, new ventures are risky.

What has been done?
University of Nebraska faculty lead a four-state effort that is identifying untapped, higher-value markets to improve small farm and ranch profitability and help alternative product ideas succeed. Launched in 1999, the North Central Initiative for Small Farm Profitability includes university researchers from Nebraska, Iowa State, Missouri and Wisconsin. Market research and case studies identify promising markets, provide vital market information and offer successful business models. The team has completed 32 case studies. Recent results highlighted the potential for supplying locally grown wheat and barley to craft breweries, producing specialty cheeses or selling locally grown food to groceries, restaurants and consumers. Organizers work with 32 producer clusters – groups of ag producers that guide research and share an interest in innovative alternatives to traditional agriculture.

Impact:
The initiative is providing market research and technical assistance to small producers that traditionally were available only to bigger businesses and at high cost. Producers are using this information in their value-added businesses to improve their chances of success. For example, technical assistance from the initiative helped a Nebraska producer group become licensed for pepper processing and led to creation of a Web site advertising the product.

A Wisconsin producer said: "We have definitely used the information from your research in putting together our cluster's business plan."

A Missouri producer said: "This is the type of information we can use when direct marketing our produce to customers."

Funding:
USDA IFAFS grant
NU Cooperative Extension
NU Agricultural Research Division
Hatch Act
Smith-Lever 3(b) & (c)

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Summary:
Tapping an alternative market can boost small farm or ranch profitability, but such new ventures are risky without solid marketing information and product research. An NU Institute of Agriculture and Natural Resources team is leading a four-state project that is identifying untapped, higher-value markets and providing information to help alternative product ideas succeed. The North Central Initiative for Small Farm Profitability provides case studies of successful businesses, market research, technical assistance and works closely with producer groups. This effort is providing small producers with market research and other information traditionally available only to bigger businesses at high cost. Producers are using this information in their value-added businesses to improve their chances of success. For example, technical assistance from the initiative helped a Sutherland producer group become licensed for pepper processing and led to creation of a Web site advertising the product.

Competitive Agricultural Systems in a Global Economy
Topic: Sorting and Mixing Pigs

Issue:
Many pork producers sort and mix lightweight pigs in a wean-to-finish barn in hopes of enhancing performance and decreasing variation in pig weight at slaughter. This takes extra time and labor.

What has been done?
This common pork industry practice doesn't improve performance or profits. A University of Nebraska animal scientist's research found that once pigs have established their home in a wean-to-finish facility it's best to leave them with their peers rather than sorting lightweight pigs and putting them together. This study showed that removing and remixing lightweight pigs doesn't improve performance or decrease variation in pig weight at slaughter. Institute of Agriculture and Natural Resources scientists also found that moving and mixing had no effect on daily gain, feed intake or carcass characteristics.

Impact:
Sorting and mixing is a common pork industry management practice. This research provides scientific proof that this time-consuming practice doesn't work. Eliminating this practice will save producers time, money and labor. In a typical 1,000-head barn, eliminating this practice can save 12 to 15 hours of labor.

Funding:
NU Agricultural Research Division
Hatch Act

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Summary:
Many producers sort and mix lightweight pigs in a wean-to-finish barn in hopes of enhancing performance and decreasing variation in pig weight at slaughter. This takes extra time and labor. University of Nebraska agricultural research proved this common practice doesn't pay. Studies showed that removing and remixing lightweight pigs doesn't improve performance or decrease variation in pig weight at slaughter. Once pigs have established their home in a wean-to-finish facility, it's best to leave them with their peers. Eliminating this practice will save producers time, money and labor.

Competitive Agricultural Systems in a Global Economy
Topic: WeedSOFT Aids Weed Management Decisions

Issue:
Deciding how, when or whether to treat weeds in crops is challenging. Farmers must consider economic, environmental and regulatory factors along with the crop and weed situation in that particular field.

What has been done?
To help growers, crop consultants and Cooperative Extension educators make better weed management decisions, University of Nebraska agronomists developed WeedSOFT software. This weed management decision-making tool incorporates research from NU's Institute of Agriculture and Natural Resources and other states. Software is improved and expanded annually. The latest versions provide comprehensive ecological and economic information on weed management. WeedSOFT was introduced in Nebraska in 1992. Today it is used by at least 560 people in six states. As part of an Integrated Pest Management project to improve weed management and reduce herbicide use, researchers in several states are promoting wider use of this tool in the north central region. State-specific versions of WeedSOFT now are available for Indiana, Illinois, Kansas, Missouri, Wisconsin and Nebraska.

Impact:
WeedSOFT is helping producers reduce crop herbicide use and associated costs, improve weed management and reduce weed-related yield losses. A survey of WeedSOFT users in six states indicated this software is responsible for about $13 million annually in cost savings and increased earnings for crop producers.

Funding:
USDA-CSREES
North Central Regional IPM Project
NU Agricultural Research Division
NU Cooperative Extension
Hatch Act

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Summary:
Deciding how, when or whether to treat weeds in crops is challenging. WeedSOFT, weed management decision support software developed at NU, helps growers and others make better decisions. This comprehensive weed management tool includes economic, environmental and regulatory considerations for all common Nebraska crops. WeedSOFT is helping producers reduce crop herbicide use and associated costs, improve weed management and reduce weed-related yield losses. A survey of WeedSOFT users indicated this software is responsible for about $13 million annually in cost savings and increased earnings for crop producers. Adapted versions of WeedSOFT also now are used in five other states.

Topic: New Beef Products Add Value

Issue:
Several new beef products developed from traditionally undervalued portions of the beef chuck and round are sparking industry and consumer interest. The science behind these new cuts is rooted in land-grant university research.

What has been done?
Meat scientists at the University of Nebraska's Institute of Agriculture and Natural Resources and University of Florida analyzed more than 5,500 muscles in the beef chuck and round to learn which might be better used. They identified higher value potential in numerous muscles traditionally used for ground beef or roasts. Nebraska scientists compiled findings in a CD-ROM and comprehensive booklet industry can use to identify promising muscles for new products. They have worked closely with the National Cattlemen's Beef Association and industry to call attention to these muscles' potential.

In 2002, researchers shared with industry the findings from their latest muscle profiling research, this one examining the higher value potential of meat from older cows. This study also identified untapped potential in several muscles in older cows.

Impact:
The beef industry has used the original muscle-profiling research findings to create innovative, higher-value products that offer economical new cuts for cost-conscious consumers and boost carcass value. The best known of NCBA's new Beef Value Cuts is the flat iron steak, which now can be found in restaurants and at meat counters. The industry also introduced other new products, such as tender medallions and the ranch cut steak, based on this research. These new cuts sell for $2.99 to $5.99 per pound, compared with roasts and ground beef that typically bring about $1.19 to $1.99 per pound.

An official for a Nebraska-based food company that markets nationally and internationally said this research adds value to the beef carcass and benefits all aspects of the industry. The flat iron steak is a growing part of the company's business.

Funding:
Cattlemen's Beef Board
Nebraska Beef Council
NU Agricultural Research Division
Hatch Act

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Summary:
Several new, higher-value beef products are creating excitement in industry and helping to boost consumer

demand for beef. The science behind these new cuts comes from University of Nebraska research. Meat scientists studied more than 5,500 muscles in the beef chuck and round and identified higher value potential in muscles traditionally used for ground beef or roasts. Collaboration with the National Cattlemen's Beef Association and industry is helping translate the findings into innovative, higher-value products to provide economical new cuts for cost-conscious consumers and increase carcass value. The best known of the new products is the flat iron steak but several others, such as tender medallions, are becoming more widely used. These cuts sell for $2.99 to $5.99 per pound, compared with roasts and ground beef that typically bring about $1.19 to $1.99 per pound.

Competitive Agricultural Systems in a Global Economy
Topic: Panhandle Chicory Production

Issue:
Farmers, agribusiness people and ag scientists are always looking for potential new crops to diversify cropping options and perhaps boost a region's economy. It's a long shot. Identifying promising crops isn't enough for success. There also must be a market.

What has been done?
Since 1995, University of Nebraska Institute of Agriculture and Natural Resources researchers and extension specialists have studied chicory's potential as a new crop for the Panhandle. Chicory is grown widely in Europe but not in the United States. NU researchers determined how best to plant, tend and harvest this root crop and showed chicory could be profitably grown in the region. The IANR team also worked with area farmers and businesses to help establish a fledgling chicory industry.

Impact:
In 2002, about 1,000 acres of chicory grown in the Panhandle were processed for use in pet food at a privately owned plant at Scottsbluff. The $2 million U.S. Chicory plant opened in 2001 as the nation's only chicory processing plant and provides 25-50 seasonal jobs. Panhandle chicory production is expected to increase to as much as 10,000 acres by 2005. Yields average 19 tons of root per acre and bring about $55 per ton. If 10,000 acres were planted, growers would gross about $10 million.

Funding:
NU Agricultural Research Division
NU Cooperative Extension
Hatch Act
Nestle Corp.
U.S. Chicory
Smith-Lever 3(b) & (c)

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Summary:
The chicory industry developing in Nebraska's Panhandle is rooted in six years of University of Nebraska agricultural research. NU Institute of Agriculture and Natural Resources scientists and Cooperative Extension specialists at the Panhandle Research and Extension Center in Scottsbluff have studied the root crop's potential since 1995. They learned how best to plant, tend and harvest chicory and showed it could be grown profitably in the region. In 2002, about 1,000 acres of chicory grown in the Panhandle were harvested and processed at U.S. Chicory's new processing plant at Scottsbluff. The plant, which opened in 2001, provides 25-50 seasonal jobs. Panhandle chicory acreage could increase to 10,000 acres by 2005, which could gross $10 million for growers.

Competitive Agricultural Systems in a Global Economy
Topic: Ranch Practicum

Issue:
Cattle production is big business in Nebraska. Wise ranch management is critical to improving the profitability and sustainability of the Beef State's cow-calf producers.

What has been done?
University of Nebraska Cooperative Extension's Ranch Practicum offers ranchers hands-on experience in integrated cattle, forage and economic management. Ranchers, veterinarians, nutritionists, conservationists and educators from Nebraska and other states participate in the practicum taught by extension educators and specialists from June to January. They spend two days in a classroom at North Platte and six days performing field laboratory activities at NU's Gudmundsen Sandhills Laboratory near Whitman. At home, they practice solving practical problems such as calculating stocking rates for pastures.

Impact:
Since 1999, 88 ranchers, veterinarians, consultants and others who manage a total of about 3.5 million acres of land and more than 1 million head of cattle have taken the practicum. They estimate the average value of knowledge gained at $27 per head. A survey of 2001 participants indicated a benefit of $23,589 per rancher for the 18 participants. Ninety percent of those surveyed expect increases in their profitability and more than 75 percent expect increases in their operation's sustainability. A young couple said they learned something at every session, adding: "Everybody who ranches should take it."

Funding:
NU Cooperative Extension
Financial institutions
User fees
Smith-Lever 3(b) & (c)

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Summary:
University of Nebraska Cooperative Extension's Nebraska Ranch Practicum teaches ranchers an integrated approach to managing cattle, forage and economics. Sessions taught by extension educators and specialists involve two days in a classroom and six days performing field laboratory activities. At home, participants practice solving problems such as calculating stocking rates for pastures and rotational grazing. Since the program began in 1999, 88 people who manage about 3.5 million acres of range and hay land and about 1 million cattle have participated. They estimate the knowledge gained is worth $27 per head. A survey of 18 participants in the 2001 practicum indicated an average benefit of $23,589 per rancher. Ninety percent of participants surveyed said the practicum will improve their profitability; more than 75 percent indicated their operation's sustainability would increase.

Competitive Agricultural Systems in a Global Economy
Topic: Turf Grass Seed Production

Issue:
Turf grass seed production is a budding alternative crop for Nebraska's Panhandle. The region's climate is well-suited to growing turf grass seed, 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 grass seed under irrigation. NU Cooperative Extension specialists and educators organize grass seed production field days and other educational meetings for those interested in producing grass seed. They also work with the region's new grass seed association.

Impact:
Turf grass seed production provides a high-value cropping option in western Nebraska. This grass seed now is produced on about 2,000 Panhandle acres, up from 300 acres in the late 1990s. Net returns of $800 to $1,000 per acre generate total income of as much as $2 million for grass seed producers. Production could grow to as many as 10,000 acres within the next 10 years.

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

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Summary:
Turf grass seed production is a budding high-value alternative crop for Nebraska's Panhandle. NU Institute of Agriculture and Natural Resources research and Cooperative Extension efforts provided groups with information on planting dates, the best varieties, fertility and water requirements and production practices. Extension staff work with the region's new grass seed production association. Thanks in part to this IANR effort, Panhandle grass seed production has jumped from about 300 acres in the late 1990s to 2,000 acres with net returns of $800 to $1,000 per acre, or about $2 million total income for grass seed producers. There's significant growth potential with a target of 10,000 acres in production in the next decade.

Safe and Secure Food and Fiber Systems
Topic: Biosecurity Education

Issue:
Disease outbreak – by accident or because of bioterrorism – could devastate Nebraska's $6 billion a year livestock industry. Awareness and caution are among the best biosecurity safeguards but veterinarians and producers need to understand how best to prevent or contain diseases.

What has been done?
University of Nebraska veterinarians are developing a new biosecurity education program with help from a $250,000 federal grant. The biosecurity curriculum primarily trains veterinarians, NU Cooperative Extension specialists and veterinary students to help livestock producers use biosecurity production practices. NU's biosecurity effort is multifaceted and includes Web-based information. Extension also coordinates disease prevention training and publications for livestock producers and youth. Training for food processors teaches awareness of potential bioterrorism and details preventative measures to minimize risks to the food supply. As part of this effort NU veterinarians also are investigating ways to prevent bovine viral diarrhea, Johne's disease, foot-and-mouth disease and the more common calf scours in Nebraska livestock.

Impact:
This training has helped at least 1,460 Nebraska livestock producers and food processors guard against intentional or accidental biosecurity threats and is greatly expanding the number of people on the lookout for such problems. This is especially important in Nebraska, a leader in livestock production. This preparation should help spot problems early and control the spread of livestock diseases.

Funding:
NU Cooperative Extension
USDA Higher Education Challenge grant
Smith-Lever 3(b) & (c)

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Summary:
Awareness and caution are among the best defenses against intentional or accidental livestock disease threats. NU Cooperative Extension is heading a biosecurity training effort to safeguard Nebraska's $6 billion livestock industry. This program teaches veterinarians, producers, youth and others how to prevent or contain disease outbreaks spread accidentally or through bioterrorism. A new Web site, meetings and publications are part of the effort, funded by a $250,000 USDA grant. NU's training programs for food processors also emphasize biosecurity and preventative measures to minimize risks to the food supply. This training has helped at least 1,460 Nebraska livestock producers and food processors guard against intentional or accidental biosecurity threats and is expanding the number of people on the lookout for such problems.
Safe and Secure Food and Fiber Systems

Topic: *E. coli* Research

Issue:
E. coli O17:H7 is a potential deadly culprit in foodborne illness outbreaks. Finding ways to control the bacteria on the farm is a critical step in reducing chances of it reaching consumers.

What has been done?
University of Nebraska scientists launched intensive interdisciplinary *E. coli* research in 1998, with funding from the state Legislature. The project involved both applied field studies and basic research that focused on controlling the organism on the farm to reduce chances of cattle carrying it into processing plants. Discoveries and developments from this five-year effort range from economical tests for *E. coli* in feedlot pens and promising control strategies to identifying genetically distinct O157:H7 populations and better understanding how *E. coli* infects cattle. NU is patenting some of these discoveries. Nebraska researchers continue to collaborate with the Canadian developers of an experimental *E. coli* vaccine. Early results from Nebraska feeding trials in 2002 showed a combination of the vaccine and a *Lactobacillus* feed additive provided the best protection against *E. coli* for feeder cattle.

Impact:
Results of this collaborative research have greatly expanded knowledge of *E. coli* and laid the foundation for future controls. Scientists elsewhere are using the NU-developed *E. coli* pen test and producers eventually might be able to use it to monitor cattle for on-farm safety programs. Genetic markers that NU scientists identified to distinguish different O157:H7 populations are the basis for new tests that allow scientists to quickly, accurately distinguish the organism's genetics.

A Nebraska beef industry official said of this research: "In a very short research timeline, we've gained tremendous knowledge. To be at the point where we are testing interventions for reducing this pathogen is a tremendous stride for industry. What they have done for the industry is really immeasurable."

Funding:
Nebraska Legislative Bill 1206
USDA National Research Initiative
Nebraska Beef Council
American Meat Institute
NU Agricultural Research Division
Hatch Act

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Summary:
Intensive interdisciplinary research by NU scientists has greatly expanded knowledge about *E. coli* O157:H7. This five-year effort laid the groundwork for future controls of this potential deadly culprit in foodborne illness outbreaks and research continues. Extensive field and laboratory studies emphasized finding ways to control the bacteria on the farm to reduce chances of it reaching consumers. Discoveries and developments from this research range from economical tests for *E. coli* in feedlot pens and promising control strategies to identifying genetically distinct O157:H7 populations and better understanding how *E. coli* infects cattle. Funding from the Nebraska Legislature, which ended in 2002, helped researchers earn nearly $5 million in additional grants to expand this research.

Safe and Secure Food and Fiber Systems
Topic: Testing Oil Freshness

Issue:
The freshest cooking oil makes the best food products so processors test their oil frequently. Unfortunately, the current commercial testing method requires the use of chloroform, which is expensive and hard to dispose of.

What has been done?
University of Nebraska food scientists studied more efficient, environmentally friendlier oil quality tests. They developed a way to quickly and accurately measure oil quality using only light. They found that near-infrared spectroscopy, a technique widely used in the grain industry, is effective for checking oil freshness. Near-infrared spectroscopy uses light wavelengths just beyond the visible range for a variety of measurements. This technique is faster and easier than chloroform-based testing. The team says it will be up to equipment manufacturers to market this technique to their customers.

Impact:
There's wide interest among food makers in eliminating the use of hazardous chemicals. This test offers an effective option that doesn't require chloroform. If adopted by industry, this new test could replace the more expensive, chloroform-based oil quality tests and provide a new tool to help food companies keep foods fresh for consumers.

Funding:
NU Agricultural Research Division
Hatch Act

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Summary:
Research by NU food scientists might help food processors test cooking oil for freshness using only light. The freshest oil makes the best products so companies frequently check oil quality, but current tests use chloroform, which is expensive and hard to use. NU Institute of Agriculture and Natural Resources food scientists developed a simple, faster test that uses near-infrared spectroscopy, which involves using light wavelengths just beyond the visible range for a variety of measurements. The technique is faster and easier than chloroform-based testing. Researchers say it's up to near-infrared equipment makers to market the technique to their customers. If adopted, it could help food companies eliminate the need for this hazardous chemical and provide a new tool to help keep foods fresh for consumers.

Healthy, Well-Nourished Population
Topic: Food Safety and Nutrition Web Site

Issue:
The link between nutrition and health has never been stronger but sorting out the latest nutrition facts can be confusing. Consumers need quick, easy access to understandable nutrition and food safety information.

What has been done?
A University of Nebraska Cooperative Extension nutrition educator developed the Food Safety, Nutrition and Preparation Web site to provide information whenever consumers need it. This site – www.lancaster.unl.edu/food – features research-based information on nutrition and food preparation, safety, shopping and preservation. It includes a healthy eating game, a food safety game, seasonal features and tips for quick, healthy meals. Some Nebraska state agencies, the USDA and several other land-grant universities link to the site as a resource. In addition to individual use, extension educators tap this information for class materials and to answer consumer questions.

Impact:
This nationally recognized Web site provides information whenever consumers need it and is an educational resource for nutrition educators. Tufts University ranked the site "Among the Best" for nutrition accuracy, depth and usefulness. The site provides useful resources, links and ideas "to help consumers every time they eat," a Tufts evaluator said, adding that the Cook It Quick feature "helps consumers get the most out of their food dollar."

Funding:
NU Cooperative Extension
Smith-Lever 3(b) & (c)

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Summary:
An NU Cooperative Extension nutrition and food safety Web site helps consumers sort out nutrition information, prepare healthy meals and stretch their food dollars with shopping and food preparation tips. The Web site – www.lancaster.unl.edu/food – provides understandable research-based nutrition and food safety information. It includes a healthy eating game, seasonal features and tips for quick, healthy meals. The Web format makes this nutrition information available whenever consumers have questions. Tufts University ranked the site "Among the Best" for nutrition accuracy, depth and usefulness. A Tufts evaluator said the site provides useful resources, links and ideas "to help consumers every time they eat."

Healthy, Well-Nourished Population
Topic: Improving Young Adults' Eating Habits

Issue:
Most young adults eat a pretty lousy diet. Their meals fall far short on fruits and vegetables at a time when they're starting on their own and establishing eating habits that often last a lifetime.

What has been done?
A University of Nebraska nutrition scientist is collaborating on an 11-state study to understand why young adults eat so few fruits and veggies and how to change these behaviors. Her preliminary research identified the best methods for reaching young adults with nutrition information. Researchers used these findings to develop new, customized approaches to encourage young adults to improve their habits. They developed newsletters, manuals and other information tailored to different stages of readiness to change and are testing them nationwide. This research will be the foundation for a broader national nutrition campaign targeting other groups and individuals.

Impact:
Experience shows that one-size-fits-all campaigns to change behavior don't work because people go through stages in their willingness to change. Developing information that nutrition educators can match to an individual's stage of change should increase the chances of improving their eating habits for the long-term.

Funding:
USDA National Research Initiative
NU Agricultural Research Division
NU College of Human Resources and Family Sciences
Hatch Act

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Summary:
When it comes to changing someone's eating habits, a one-size approach often fails. That's because people go through phases in their willingness to change. An NU nutrition scientist is working on multistate research that has developed and is testing newsletters, manuals and other educational information tailored to different phases of change. These materials are customized for young adults, who have among the least healthy diets and eat the fewest fruits and vegetables. This customized approach should be the basis of more effective nutrition education efforts targeting young adults. It also will be the foundation for broader national nutrition campaigns targeting other groups and individuals.

Healthy, Well-Nourished Population
Topic: Nutrition Education Programs

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

What has been done?
Extension nutrition programs teach everything from good budgeting and meal planning to food safety and nutrition to help families become more self-sufficient. Extension teams with federal programs such as the Women, Infants and Children program and Head Start, Nebraska Health and Human Services, Employment First programs, local food pantries and food banks, family resource centers, public schools and social service organizations to offer nutrition programs that help low-resource Nebraskans. More than 75,000 Nebraska families have participated in the Expanded Food and Nutrition Program (EFNEP) since it started in 1969. Nearly 14,000 families in 26 counties have participated in the Food Stamp Nutrition Education Program (FSNEP) since it began in 1994.

Impact:
Extension's evaluations show that 88 percent of nutrition program graduates adopt better ways to spend their food dollars and 61 percent make food safety improvements. A Department of Health and Human Services official said that partnering with NU extension provides nutrition education to 85 percent to 90 percent of the state's food stamp recipients. He said this training teaches them to make the best use of their limited food stamp money.

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

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Summary:
University of Nebraska Cooperative Extension nutrition programs help low-resource Nebraskans improve how they shop and budget for food as well as what they eat. This boosts their self-sufficiency and improves their nutrition. More than 75,000 Nebraska families have participated in the Expanded Food and Nutrition Program since it started in 1969. Nearly 14,000 families in 26 counties have participated in the Food Stamp Nutrition Education Program since it began in 1994. Research shows 88 percent of nutrition program graduates adopt better food dollar spending habits and 61 percent make food safety improvements. A state Department of Health and Human Services official said that partnering with NU extension provides nutrition education to 85 percent to 90 percent of the state's food stamp recipients. This training teaches recipients to make the best use of their limited food stamp money.

Healthy, Well-Nourished Population
Topic: Smoking and Diet

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

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

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

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

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

Healthy, Well-Nourished Population
Topic: Sun-Protective Clothing Standards

Issue:
Consumers need assurances that clothing marketed for sun protection actually blocks harmful ultraviolet radiation. For people who have skin cancer or are undergoing radiation or chemotherapy, adequate sun protection can be a life-or-death matter.

What has been done?
A University of Nebraska textile scientist extensively studied different fabrics' ultraviolet protective properties. This Institute of Agriculture and Natural Resources research provided information for clothing makers and helped lay groundwork for national standards for sun-protective clothing. This scientist has been a leader on national committees that worked with federal consumer protection agencies to develop standards for testing and labeling UV-protective clothing.

Impact:
Standards for sun-protective clothing were finalized in 2000. The clothing industry is rapidly adopting these voluntary standards. This standardization makes the labels less confusing. It also is helping consumers make better-informed decisions and assure that protective clothing delivers the UV protection it promises.

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

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Summary:
Consumers need assurances that clothing marketed for sun protection actually blocks harmful ultraviolet radiation. A University of Nebraska textile scientist's research on fabrics' UV-protective properties provided information for clothing makers and helped lay groundwork for national standards for sun-protective clothing. This Institute of Agriculture and Natural Resources scientist has been a leader on national committees developing standards for testing and labeling UV-protective clothing. Thanks in part to this work, standards for sun-protective clothing were finalized in 2000. The clothing industry is rapidly adopting these voluntary standards. Standardization helps consumers make better-informed decisions and assure that protective clothing delivers the UV protection it promises.

Greater Harmony Between Agriculture and the Environment
Topic: **Buffer Strip Assessment Tool**

Issue:
Strips of vegetation between crop fields and streams filter sediment and chemical runoff to protect waterways from pollution. While their water quality protection value is well-recognized, there has been no practical way to measure buffer strip performance under real-world conditions.

What has been done?
University of Nebraska researchers have developed a simple, accurate sampling device that measures water flow into and out of buffers so that performance can be assessed in the field. Their sampler captures a tiny but representative fraction of the water flowing through the buffer. Lab analysis of the sample reveals how effective the strip is at keeping contaminants from streams. This device will help other researchers more accurately assess buffer strip design and construction. A simpler version is being developed for natural resources and conservation agencies to use.

Impact:
Buffer strips are the focus of numerous federal, state and local water quality protection efforts. This in-field sampler will lead to more accurate buffer strip evaluation under Great Plains growing conditions. This should result in better buffer strip design and construction.

Funding:
NU Agricultural Research Division
USDA National Agroforestry Center
Hatch Act
Nebraska Corn Board

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Summary:
Vegetative buffer strips between crop fields and streams filter sediment and chemical runoff to protect water quality. Buffer strips are key to many surface water protection efforts, yet there has been no practical way to measure their performance under real-world conditions. NU Institute of Agriculture and Natural Resources engineers have devised a simple, accurate tool to evaluate buffer strips effectiveness in the field. Their device takes a tiny but representative water sample that is analyzed to learn how well the buffer strip is performing. This device is designed for use by researchers. A simpler version is being developed for natural resources and conservation agencies. Both will help more accurately evaluate buffer strip design and construction, which should lead to better buffer designs.

Greater Harmony Between Agriculture and the Environment
Topic: Irrigation Management Home Study Course

Issue:
Irrigation is the lifeblood of Nebraska agriculture with more than 7 million irrigated acres. Irrigation management is key to efficient water use, reducing costs and protecting water quality.

What has been done?
University of Nebraska Cooperative Extension's Irrigation Management Home Study Course provides self-paced lessons and quizzes that outline irrigation management concepts and offer practical information on ways to use water more efficiently. The course is designed for crop consultants, irrigators and agency personnel. More than 140 students have taken the course since 1998. The 13-chapter course is available in a notebook and on the Web.

Impact:
Participants say this course helped them reduce irrigation costs and water use, increase crop yields and protect against water contamination. A post-course survey found that 65 percent of participants expected to improve their irrigation systems and 62 percent expected to save money as a result of what they learned. Nine participants also estimated that knowledge gained would save an average of $4.22 per acre on the 29,125 acres they managed, for a potential total savings of more than $122,890.

Funding:
NU Cooperative Extension
Course fees
Smith-Lever 3(b) & (c)

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Summary:
Nebraska has more than 7 million acres of irrigated cropland. Irrigation management is key to efficient water use, reducing costs and protecting water quality. NU Cooperative Extension's Irrigation Management Home Study Course provides self-paced lessons featuring practical information on how to use water more efficiently. It is designed for crop consultants, irrigators and agency personnel; more than 140 people have taken the course since 1998. Participants say this course helped them reduce irrigation costs, use water more efficiently, improve yields and reduce water contamination. Participants who estimated the value of knowledge gained said it would save them an average of $4.22 per acre.

Greater Harmony Between Agriculture and the Environment
Topic: Livestock and Poultry Environmental Stewardship Curriculum

Issue:
Neighbors, the public and regulators increasingly are scrutinizing livestock and poultry operations' manure management. Producers need solid, science-based information to help them address environmental issues.

What Has Been Done?
Faculty from the University of Nebraska and North Carolina State co-led a team that included experts from 15 land-grant universities who developed a comprehensive national Livestock and Poultry Environmental Stewardship Curriculum. The curriculum features 26 lessons covering environmental issues related to livestock production, from manure management and odor control to waste storage design and dietary strategies. It's available in print or on CD. Nearly 500 extension educators, agency staff, industry representatives, producers and others from 46 states, two Canadian provinces and Guam have been trained to teach this curriculum. These people lead state education programs targeting livestock producers and their advisors on environmental issues. Individual producers also can reference this information for the latest scientific recommendations on manure management issues.

Impact:
This curriculum provides sound, science-based information that is helping producers nationwide improve their manure management and implement better environmental practices. A survey of participating states six months after the leader training showed that 39 states were already incorporating LPES resources into educational activities. For example, in Kentucky a task force used the information to prepare basic training materials for 60,000 farmers whose farms must meet new state water quality regulations.

An EPA official praised the quality of the information and its impact: "The team's work has had a significant impact in advancing the science of livestock management, in serving individual farmers and ranchers, and in informing state and federal regulators."

Funding:
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U.S. Environmental Protection Agency
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Summary:
Manure management is an increasingly important issue for livestock and poultry producers. A new educational curriculum is helping producers manage manure and keep up with regulations. The Livestock and Poultry Environmental Stewardship Curriculum features comprehensive information on livestock-related environmental issues. An NU livestock environmental engineer co-led development of this new learning tool, which is being taught nationwide. This curriculum provides sound, science-based information for farmers and ranchers and is endorsed by USDA and the U.S. Environmental Protection Agency.
Greater Harmony Between Agriculture and the Environment

Topic: Monitoring Lake Water Quality

Issue:
Agriculture is the dominant influence on lakes and reservoirs in Nebraska. However, most national criteria used to monitor and classify lake water quality weren't designed with agricultural areas in mind.

What has been done?
University of Nebraska scientists are studying the interaction between agriculture and surface water to develop a model lake classification system suited to agricultural areas. They've sampled more than 250 Nebraska lakes and reservoirs and are developing computer models to compare current and historical water quality to develop tools to more accurately assess water quality. Finding ways to remotely monitor water quality instead of sampling water at each lake is a major goal. Researchers are developing "spectral signatures" of the lakes, using equipment that measures algae concentrations based on reflected light patterns. The extent of algae blooms help indicate a lake's nutrient levels and water quality. When perfected, measurements could be made from an airplane or satellite.

Impact:
Developing research-based tools to classify and monitor lakes and reservoirs in agricultural areas should help natural resources and environmental agencies protect water quality and determine which are the best candidates for restoration. Remote sensing of water quality should make monitoring easier and less expensive.

Funding:
U.S. Environmental Protection Agency
Nebraska Department of Environmental Quality
NU Agricultural Research Division
Hatch Act

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Summary:
NU scientists are studying the interaction of agriculture and surface water to develop a lake classification and water quality monitoring system suitable for agricultural areas. They've sampled more than 250 Nebraska lakes and reservoirs and are developing computer models to compare current and historical water quality to develop tools to more accurately assess water quality. They're also working on ways to remotely monitor water quality instead of sampling water at each lake to save time and money. Ultimately, their system should help better protect and maintain lake water quality in agricultural regions.

Greater Harmony Between Agriculture and the Environment
Topic: Nitrogen Management in Crop Production

Issue:
Carefully managing nitrogen fertilizer use in crop production helps cut farmers' costs and reduces chances of water pollution.

What has been done?
For more than 20 years, University of Nebraska soils scientists have studied crop nitrogen needs and field-tested application rates in different Nebraska soils to help farmers use less fertilizer, maintain yields and protect water quality. NU fertilizer recommendations based on these findings and other research results have been taught through NU Cooperative Extension and Natural Resources District education programs. Efficient nitrogen use can increase farmers' profits and decrease chances of excess nitrogen leaching into groundwater. NU research indicates that producers often can reduce the amount of nitrogen applied to corn without significantly reducing yields or profits, or achieve higher yields and profits with the same amount of nitrogen applied, provided they follow established best management guidelines. This research helped demonstrate the importance of regular soil testing and the use of accurate soil testing methods. Research also showed how best to account for all available nitrogen including what's in irrigation water, soil, legumes and manure; and provided information on improving application timing and irrigation efficiency.

Impact:
Thanks partly to NU research and educational efforts, Nebraska farmers are using nitrogen fertilizer more efficiently. In 1965, the state's farmers used an average of more than 1.5 pounds of fertilizer nitrogen, sometimes as much as 2 pounds per bushel of corn. By 2000, that dropped to close to 1 pound per bushel. The Nebraska Agricultural Statistics Service estimates annual savings of $2.7 million because of increased nitrogen fertilizer efficiency. Lower application rates also mean that more of the applied nitrogen is taken up by the crop, leaving less to leach into groundwater.

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

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Summary:
Reducing the amount of nitrogen fertilizer used in crop production helps cut farmers' costs and reduces chances that excess nitrogen will pollute groundwater. NU Institute of Agriculture and Natural Resources soil scientists have studied crop fertilizer needs and field-tested fertilizer application rates in different Nebraska soils to help farmers use less fertilizer but maintain yields. They've found that producers often can significantly reduce nitrogen fertilizer applications without greatly reducing corn yields or profits by accounting for nitrogen credits from soil, irrigation water, legumes and manure. In 1965, Nebraska producers used an average of more than 1.5 pounds of fertilizer nitrogen, sometimes as much as 2 pounds per bushel of corn. By 2000, that dropped to 1 pound per bushel. The Nebraska Agricultural Statistics Service estimates annual savings of $2.7 million.

Greater Harmony Between Agriculture and the Environment

Topic: Republican River Basin Irrigation Management Project

Issue:
Irrigation water is at a premium in Nebraska's Republican River Basin. The region's surface water is limited by water use agreements with adjoining states and continued drought that has shrunk reservoirs and lowered groundwater levels. Farmers need to know how to make the most of the limited water available for crops.

What has been done?
University of Nebraska Cooperative Extension launched the Republican River Basin Irrigation Management Project to demonstrate crop yields under different irrigation timing and amounts. The goal is to increase water use efficiency for corn and soybeans by 5 percent over the next five years. In 2002, extension educators demonstrated corn's response to three water strategies – full, water miser and deficit irrigation. Full irrigation provided enough water to keep moisture stress from limiting yields. The water miser strategy focused on saving water during less sensitive vegetative growth stages and watering fully during critical reproductive growth. Under deficit irrigation, application of limited water is timed to maximize yields from water used. Plots also demonstrated ways to improve irrigation efficiency, reduce tillage and grow crops requiring less water.

Impact:
Reducing water use is especially important in the Republican River Valley but will continue to be significant across the Great Plains as demand for water increases. This project lets growers see firsthand how to sustain yields with less water. For example, the water miser strategy used 31 percent less water while reducing yields only 3 percent. The savings in pumping costs virtually offset yield loss.

Funding:
U.S. Bureau of Reclamation
NU Cooperative Extension
Smith-Lever 3(b) & (c)

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Summary:
Irrigation water is at a premium in Nebraska's Republican River Basin. Farmers need practical information about how to make the most of the limited water. NU Cooperative Extension launched the Republican River Basin Irrigation Management Project to show farmers and crop consultants how the timing and amount of water affect crop yields. Using information from this demonstration project, producers can produce nearly the same yields with less water. For example, the project showed that a water miser strategy used 31 percent less water but reduced corn yields only 3 percent. The savings in pumping costs virtually offset yield loss. The project's goal is to increase water use efficiency for corn and soybeans by 5 percent over the next five years.

Greater Harmony Between Agriculture and the Environment
Topic: Rootworm Resistance Research

Issue:
In the 1990s, insecticides used to control western corn rootworms began to fail in some central Nebraska counties. This major corn pest had become resistant to a common adult rootworm insecticide.

What has been done?
University of Nebraska entomologists have extensively studied this problem to preserve the effectiveness of future insect-fighting technologies. NU scientists helped farmers identify alternatives to adult rootworm control, mapped the extent and spread of resistance, and encouraged practices to limit further development. They also identified the biochemical and genetic mechanisms for organophosphate resistance and how resistance is inherited, and developed a test to check rootworms for resistance. In collaboration with a Mississippi State computer modeling specialist, NU researchers are applying these findings to a computer model that simulates field conditions and predicts how long a rootworm control will be effective, based on factors such as management and cropping practices. They have verified the model's accuracy by comparing it to what happened with resistance in Nebraska. They're also working with University of Maryland scientists to map genes associated with resistance.

Impact:
What NU scientists have learned from Nebraska's rootworm resistance should help regulators, industry and producers preserve the effectiveness of new insect control tools, such as Bt corn for rootworms and other new, more environmentally friendly technologies. The computer model should provide more accurate predictions of the outcome of specific management approaches and improve decisions about how to use these tools.

Funding:
USDA – CSREES
NU Agricultural Research Division
Hatch Act

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Summary:
In the 1990s, insecticides to control western corn rootworms began to fail in parts of Nebraska. This major pest had become resistant to a common adult rootworm insecticide. NU entomologists are working to prevent similar problems in the future. Institute of Agriculture and Natural Resources scientists have extensively studied rootworm resistance to organophosphate insecticide in the field and the lab. They've learned a great deal about the biochemical and genetic mechanisms of resistance. In collaboration with Mississippi State, they are incorporating their findings into a computer model that simulates field conditions and predicts whether resistance develops, based on factors such as management and cropping practices. Their goal is to identify ways to preserve the effectiveness of new insect control tools, such as Bt corn for rootworms and other environmentally friendly technologies.

Greater Harmony Between Agriculture and the Environment
Topic: WeedSOFT Aids Weed Management Decisions

Issue:
Deciding how, when or whether to treat weeds in crops is challenging. Farmers must consider economic, environmental and regulatory factors along with the crop and weed situation in that particular field.

What has been done?
To help growers, crop consultants and Cooperative Extension educators make better weed management decisions, University of Nebraska agronomists developed WeedSOFT software. This weed management decision-making tool incorporates research from NU's Institute of Agriculture and Natural Resources and other states. Software is improved and expanded annually. The latest versions provide comprehensive ecological and economic information on weed management. WeedSOFT was introduced in Nebraska in 1992. Today it is used by at least 560 people in six states. As part of an Integrated Pest Management project to improve weed management and reduce herbicide use, researchers in several states are promoting wider use of this tool in the north central region. State-specific versions of WeedSOFT now are available for Indiana, Illinois, Kansas, Missouri, Wisconsin and Nebraska.

Impact:
WeedSOFT is helping producers reduce crop herbicide use and associated costs, improve weed management and reduce weed-related yield losses. A survey of WeedSOFT users in six states indicated this software is responsible for about $13 million annually in cost savings and increased earnings for crop producers.

Funding:
USDA-CSREES
North Central Regional IPM Project
NU Agricultural Research Division
NU Cooperative Extension
Hatch Act

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Summary:
Deciding how, when or whether to treat weeds in crops is challenging. WeedSOFT, weed management decision support software developed at NU, helps growers and others make better decisions. This comprehensive weed management tool includes economic, environmental and regulatory considerations for all common Nebraska crops. WeedSOFT is helping producers reduce crop herbicide use and associated costs, improve weed management and reduce weed-related yield losses. A survey of WeedSOFT users indicated this software is responsible for about $13 million annually in cost savings and increased earnings for crop producers. Adapted versions of WeedSOFT also now are used in five other states.

Greater Harmony Between Agriculture and the Environment
Topic: Cleaning Up Pesticide-Contaminated Soil

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

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

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

Funding:
NU Agricultural Research Division
Hatch Act
U.S. Environmental Protection Agency, EPSCoR
U.S. Geological Survey
Nebraska Environmental Trust Fund
UNL Water Center
UNL School of Natural Resource Sciences Interdisciplinary Research Program
Great Plains-Rocky Mountain Hazardous Substance Research Center

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

Greater Harmony Between Agriculture and the Environment
Topic: Measuring Carbon Storage in Cropland

Issue:
Concerns about global climate change are mounting because of increasing atmospheric concentrations of carbon dioxide (CO_2), a major greenhouse gas. Understanding how to store more carbon in cropland could help reduce the threat of global warming, and farmers might earn extra income for enhancing carbon storage.

What has been done?
University of Nebraska Institute of Agriculture and Natural Resources scientists are leading research to measure and understand how carbon cycles through the atmosphere, plants and soil in cropland. They're closely measuring all CO_2 entering and leaving fields in their 420-acre outdoor laboratory. They developed a state-of-the-art facility to extensively track CO_2 in an entire agricultural system and compare different cropping systems at a scale comparable to commercial farming. They are comparing how different crops and farming practices influence carbon storage and movement in the plant-soil system. They'll use this information to help quantify cropland carbon storage and to develop recommendations on cost-effective management practices to increase carbon storage.

Impact:
This research will provide practical information to help farmers increase carbon storage on their land and better quantify the carbon storage benefits of various practices. Such information will be critically important to improve environmental quality and maximize potential benefits to Nebraska farmers if programs are established to provide compensation for storing carbon in cropland. Because carbon storage increases soil organic matter content, which is the fabric of soil quality, this research also will help improve soil quality.

Funding:
U.S. Department of Energy
Nebraska Corn Board
NU Agricultural Research Division
Hatch Act

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Summary:
Concerns about global climate change are mounting because of increasing atmospheric concentrations of carbon dioxide, a major greenhouse gas. Understanding how to store more carbon in cropland could help reduce the threat of global warming, and farmers might earn extra income for enhancing carbon storage. NU Institute of Agriculture and Natural Resources scientists are heading interdisciplinary research to measure, compare and understand carbon dioxide's movement through the atmosphere, plants and soil in irrigated and dryland cropping systems. They've developed a 420-acre, state-of-the-art research facility to examine carbon storage in an entire agricultural system. They aim to identify the factors influencing carbon movement and develop cost-effective management practices farmers can use to boost carbon storage. Such information will be important to improve environmental quality and maximize potential benefits to Nebraska farmers if programs are established to provide compensation for storing carbon in cropland.

Topic: Pivots, Nitrogen Management Protect Water Quality

Issue:
Careful nitrogen management and the right technology can help farmers protect groundwater from excessive nitrate contamination, which is a concern for private and municipal drinking water wells. University of Nebraska research shows that center pivot systems can be part of that management equation.

What has been done?
A six-year NU Institute of Agriculture and Natural Resources study compared nitrate-nitrogen levels in shallow groundwater under test fields irrigated with surge, conventional furrow irrigation or center pivots. Results show nitrate levels were consistently lower under center pivot-irrigated fields. Compared with the furrow-irrigated field, the surge-irrigated field received 60 percent less water and 31 percent less nitrogen, while the center pivot field used 66 percent less water and 37 percent less nitrogen. Although the surge-irrigated field received almost as much water as the pivot field, surge didn't limit nitrate contamination nearly as well. The study also showed the best way to limit nitrate leaching into groundwater is by controlling water use and spoon-feeding nitrogen fertilizer to crops through a center pivot.

Impact:
Nebraska has more than 7 million irrigated acres and center pivots irrigate more than two-thirds of them. This research shows that this widely used irrigation technology can help farmers keep groundwater nitrate levels at or near 10 parts per million, the federal maximum for drinking water. These easily taught management practices, which employ equipment and fertilizers farmers already have, should help maintain groundwater nitrate concentrations at more acceptable levels without reducing crop yields.

Funding:
U.S. Department of Agriculture
Nebraska Research Initiative
Central Platte Natural Resources District
NU Agricultural Research Division
Hatch Act

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Summary:
Careful nitrogen management and the right technology can help farmers protect groundwater from excessive nitrate contamination. A six-year NU Institute of Agriculture and Natural Resources study found that nitrate-nitrogen levels were consistently lower under pivot-irrigated than surge- or conventional furrow-irrigated plots. Nebraska has more than 7 million acres of irrigated cropland and center pivots irrigate more than two-thirds of that acreage. Management practices this study identified are easily taught and use equipment farmers already have. Adopting these practices should help farmers maintain groundwater nitrate concentrations at more acceptable levels without reducing crop yields.

Greater Harmony Between Agriculture and the Environment
Topic: Reducing Livestock Methane

Issue:
As the second most abundant greenhouse gas, methane plays a significant role in global warming. The world's agricultural livestock produce about 17 percent of the methane in the atmosphere. Finding ways to reduce methane production in cattle could help the environment and cut feed costs.

What has been done?
Methane is a byproduct of digestion in cattle and other ruminants. University of Nebraska scientists have found a way that might reduce the amount of methane cattle produce during digestion and enhance fatty acids that cattle use for energy. A biochemist, chemist and animal scientist have teamed to design and test several chemical compounds that block methane production by inhibiting a key enzyme. Some of the methane-blockers work well in the lab; they still must be tested in cattle. The university is patenting the team's novel methane inhibitors and the concept. Researchers are working with a private company to explore commercializing a cattle feed additive designed to improve feed efficiency by reducing methane.

Impact:
Between 5 percent and 15 percent of digestible energy in feed is lost as methane gas so inhibiting methane would reduce feed requirements and feed costs. The environment could be the big winner if the NU-developed inhibitors prove useful and become widely used. An NU researcher estimates that reducing methane produced by livestock by 50 percent could significantly reduce global warming.

Funding:
National Institutes of Health
PharmAgra
NU Agricultural Research Division
Hatch Act

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Summary:
Methane is a major greenhouse gas and the world's agricultural livestock produce about 17 percent of the methane in the atmosphere. The environment and cattle producers both could benefit if cattle produce less methane. University of Nebraska scientists developed several compounds that inhibit a key methane-production enzyme in cattle's digestive tracts. The inhibitors work in the lab; scientists still must test them in cattle. NU is patenting their inhibitors and concept. Researchers are working with a private company on a potential commercial feed additive designed to improve feed efficiency by reducing methane. If these inhibitors work in cattle, the environment could be the big winner. An NU researcher estimates that reducing livestock methane by 50 percent could significantly reduce global warming.

Economic Development and Quality of Life for People and Communities
Topic: Bridging the Technology Gap

Issue:
A lack of computer skills can be a real disadvantage in today's increasingly computer-driven society. Learning computer skills in conventional classes can be especially challenging for new residents who speak little or no English.

What has been done?
The Hispanic population in Dawson County, Nebraska, grew rapidly in the past decade after a meat processing plant opened, so University of Nebraska Cooperative Extension offers Bridging the Technology Gap computer classes in Spanish and English. While classes are open to all, most participants are Hispanic. The classes are held in the public library and teach computer skills to children, youth and adults with little or no computer background. More than 300 people have participated in the four hours of free basic computer training.

Impact:
Organizers say the classes build computer skills, increase self-confidence, volunteer participation and pride, and help newcomers acclimate to a different culture. They also create positive interactions when Hispanic teen-agers help out longtime area senior citizens taking the course. After completing the class, one couple bought a new computer for themselves, gave their old one to their five kids and were able to help them with school work using the computer.

Funding:
NU Cooperative Extension
Dawson County
USDA CYFAR
US West
American Distance Education Consortium
Nebraska Health and Human Services

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Summary:
Learning computer skills in traditional classes is especially hard for people who speak little English. NU Cooperative Extension offers Bridging the Technology Gap computer classes in Spanish and English to help Dawson County's growing Hispanic population. Anyone can take the classes but most participants are Hispanic. More than 300 people have taken four hours of free basic computer education. Organizers say the classes build skills, boost self-confidence and help newcomers acclimate to a new culture. For example, after completing the class, one couple bought a new computer, gave their old one to their kids and were able to help their five children with school work using the computer.

Economic Development and Quality of Life for People and Communities
Topic: Consumer Preference and Economic Leakage Study Program

Issue:
Small-town mom-and-pop businesses have been losing customers to stores in nearby larger towns and cities. This so-called "economic leakage" hurts smaller businesses and the economic growth of rural communities.

What has been done?
To help small businesses become more competitive, University of Nebraska Cooperative Extension conducts a consumer preference and economic leakage study as part of a program to determine why rural residents leave their hometowns to shop in larger areas. Since 1997, 20 Nebraska communities, about 425 businesses and about 4,600 consumers have participated in the study. Surveys determine factors that affect consumer shopping decisions and provide information about what small businesses can do to attract and keep customers. The program includes individual business consultations where owners and managers learn about their businesses' strengths, weaknesses, customer concerns and strategies for making their business more competitive. The program also offers consumer education to acquaint local shoppers with locally available products and services.

Impact:
Business and community leaders have used information learned in the surveys to make improvements, including expanding and starting new enterprises. In Gothenburg, where 90 percent of survey respondents said they left town to buy clothes and shoes, community leaders recruited a new clothing and shoe store, which opened five months after the survey's completion. In Minden, leaders attracted a new fast food restaurant after survey respondents said they left town to go to the restaurant elsewhere. A drugstore owner in Ogallala learned his customers didn't like the location of a gift display that partially blocked the view inside, so he moved it and made it easier for customers to see inside and for employees to see customers enter. The owner of a Christian bookstore in Holdrege learned her customers didn't like the cluttered look of the store. She moved to a larger building and customers have made positive comments.

Funding:
NU Cooperative Extension
Nebraska Lied Main Street Program
Various community chambers of commerce, economic development groups and businesses
Smith-Lever 3(b) & (c)

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Summary:
Small-town businesses suffer when customers head for bigger stores in bigger cities for shopping. University of Nebraska Cooperative Extension's consumer preference and economic leakage study surveys consumers to learn local consumer shopping preferences and what small businesses can do to keep their customers. The program includes consultations to help businesses learn how to be more competitive. Since 1997, 20 communities, 425 businesses and 4,600 consumers have participated in the survey. Results prompted several small businesses to make changes that have helped them keep customers and communities to recruit businesses sought by consumers. For example, in Gothenburg, 90 percent of survey respondents said they left town to buy clothes and shoes. Community leaders recruited a new clothing and shoe store, which opened five months after the survey's completion.

Economic Development and Quality of Life for People and Communities
Topic: Decorative Millet Earns All-America Selections Gold

Issue:
Gardening is the nation's leading hobby and gardeners are always looking for easily grown plants that put on a show.

What has been done?
University of Nebraska pearl millet breeders typically work on improved forage and grain varieties, not garden plants. But a decorative version of pearl millet that they developed because of its unusual purple leaves is grabbing attention in garden catalogs and garden centers after earning a prestigious garden plant award. NU's Purple Majesty was an All-America Selections Gold Medal award winner for 2003. The Gold Medal is reserved for plant breeding breakthroughs and typically awarded only once or twice a decade. This annual hybrid grows easily in sunny, well-drained sites nationwide and features decorative seedheads. A plant wholesale company markets Purple Majesty to the nursery industry through a licensing agreement with NU.

Impact:
Purple Majesty seedlings and seed are now widely available through seed catalogs and garden centers. Its outstanding performance in the All-America Selections trials shows that it's widely adapted to gardens nationwide and should provide a showy new plant for home gardens.

Funding:
NU Agricultural Research Division
Hatch Act
Ball Horticultural Products Co.

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Summary:
NU millet breeders typically work on improved forage and grain varieties. But a showy version of pearl millet they developed because of its unusual purple leaves is grabbing gardeners' attention nationwide after winning a prestigious award. Called Purple Majesty, the purple millet was an All-America Selections Gold Medal award winner for 2003. The Gold Medal is reserved for plant breeding breakthroughs and typically awarded only once or twice a decade. A plant wholesale company markets Purple Majesty to the nursery industry through a licensing agreement with NU. Purple Majesty plants and seed are now widely available to home gardeners through catalogs and nurseries and should provide a new, easily grown and showy annual hybrid for home gardens.

Economic Development and Quality of Life for People and Communities
Topic: Distance Counseling Improves Access for Rural Residents

Issue:
Mental health counseling services sometimes are hard to come by in parts of Nebraska where a therapist can be hours away. Technology might bridge the distance that makes it difficult for rural residents to access counseling.

What has been done?
A University of Nebraska family scientist is studying the potential of using two-way video technology to make counseling more accessible. He and graduate students in marriage and family therapy work with clients in several western Nebraska counties for a pilot study of long-distance counseling's feasibility. Counselors and clients meet face-to-face early in the process, then conduct sessions long-distance. A two-way video link via satellite connects the counselor in Lincoln to clients who often use the local high school's distance education classroom for sessions. The goal is to pin down the factors critical to successful distance counseling.

Impact:
This research is identifying how to effectively provide therapy via technology to make counseling services more accessible to rural residents. Therapists, agencies and others who provide services can use the NU findings to better serve rural areas. Clients say that having access to counseling compensates for less in-person contact with a therapist and that the sessions are very helpful.

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

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Summary:
In parts of rural Nebraska, counseling services can be hours away. An NU family scientist thinks technology might bridge the miles that can make it difficult for rural residents to access mental health counseling. He and graduate students are working with clients in several western Nebraska counties for a pilot study of long-distance counseling's feasibility. A two-way video link via satellite connects the counselor in Lincoln to clients who typically use the local high school's distance education classroom for sessions. This research is identifying how best to provide therapy via technology to make services more accessible to rural residents. Clients say that having access to counseling compensates for less in-person contact with a therapist and that the sessions are helpful.

Economic Development and Quality of Life for People and Communities
Topic: Drought Web Site

Issue:
The drought that gripped Nebraska in 2002 had a devastating impact on the state's agriculture-based economy while communities and homeowners struggled with water shortage. With the state facing continued drought, Nebraskans need easily accessible research-based information to help them make decisions about how to cope with drought.

What has been done?
In 2002, University of Nebraska Cooperative Extension worked with communications and technology specialists to develop a focused drought Web site that packages drought-related information in an easy-to-use format. The site – http://ianrhome.unl.edu/drought/ – includes drought-related news stories and newsletters from the Institute of Agriculture and Natural Resources, links to extension publications, television and radio programming, satellite conferences, other land-grant universities, national and state resources, weather information and more. Numerous state agencies link to the university site, which averaged about 1,000 visits a month during the last half of 2002.

Impact:
The drought caused more than $1 billion in agricultural losses in Nebraska in 2002. This site gives farmers, ranchers and others 24-hour access to the latest drought information from the university and elsewhere so they can make informed choices about their crops, livestock and water use. Such decisions ultimately affect the state's economy and water resources.

Funding:
NU Institute of Agriculture and Natural Resources
Smith-Lever 3(b) & (c)

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Summary:
The continuing drought has had a devastating impact on Nebraska's agriculture-based economy and its communities. Because unbiased, research-based information is a key in helping ag producers and others cope with drought, NU Cooperative Extension worked with communications and technology specialists to develop a drought Web site that packages drought-related information in an easy-to-use format. The site – http://ianrhome.unl.edu/drought/ – includes Institute of Agriculture and Natural Resources information, extension publications, radio and TV programming, and other drought-related resources across Nebraska and the nation.

Economic Development and Quality of Life for People and Communities
Topic: Forensic Entomology

Issue:
Investigators often need every edge they can get to solve a crime. Even insects can provide important clues.

What has been done?
University of Nebraska entomologists have been teaching forensic entomology workshops for law enforcement officers, including the FBI, across the state since 2001. Participants learn what insect evidence to look for and how to interpret and evaluate what they do and don't find. Officers use this information for such things as corroborating witness and suspect stories or determining the time and place of death. Early response has been positive and the NU entomologists hope to offer this training to more agencies.

Impact:
Law enforcement officers say knowing how to properly collect, interpret and analyze insect evidence changes how they handle a crime scene and aids their investigations.

Funding:
NU Cooperative Extension
Smith-Lever 3(b) & (c)

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Summary:
Investigators often need every edge they can get to solve a crime. Even insects can provide important clues. University of Nebraska entomologists teach forensic entomology workshops to law enforcement officers so they can properly interpret and evaluate insect evidence. Officers use this information for things such as corroborating witness and suspect stories or determining time and place of death. Law enforcement officers say this training changes how they handle a crime scene and aids their investigations.

Economic Development and Quality of Life for People and Communities
Topic: National Drought Mitigation Center

Issue:
Drought is a natural but costly phenomenon. At its peak during 2002, more than half of the nation was in drought. Only droughts of the 1930s and late 1950s affected a greater percentage of the country. Nationwide drought costs were $10 billion to $20 billion.

What has been done?
The University of Nebraska's National Drought Mitigation Center helps regional governments and policy-makers reduce society's vulnerability to drought through risk management-oriented planning, assessment and information. Step-by-step drought planning tools developed by the NU Institute of Agriculture and Natural Resources climatologist who heads the center help governments to create drought plans. The U.S. Drought Monitor, a nationwide Web-based drought tracking tool, now is extensively used by officials, the media and the public. The map is updated weekly to track emerging trouble spots. NU researchers collaborated with USDA and the National Oceanic and Atmospheric Administration to introduce this tool in 1999. The center maintains the Drought Monitor Web site, which had 5 million visits in 2002. Building on its success, scientists plan to incorporate data from Canada and Mexico into a monthly North American Drought Monitor map in spring 2003.

The NDMC is collaborating with USDA's Risk Management Agency to develop better drought risk assessment tools for ag producers nationwide. The center's director is working with the Western Governors' Association and Congress on a drought preparedness bill. The center also helps many countries with drought issues and is working with the United Nations to develop regional drought preparedness networks worldwide. The center would co-lead this project.

Impact:
The center helps governments anticipate and minimize drought risks. Thanks in part to the center's work, drought planning efforts nationwide have shifted from a reactive crisis management to a proactive risk management approach. The number of states with drought plans continues to grow. By the end of 2002, 36 states had plans, including several revised to emphasize risk management, and three more were in the works. Many of those plans are based on the Nebraska-developed planning tools.

Funding:
USDA
National Drought Mitigation Center
NU Agricultural Research Division
Hatch Act

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Summary:
NU's National Drought Mitigation Center helps governments and policy-makers reduce society's vulnerability by anticipating and taking steps to minimize drought impacts. Drought planning tools developed by the Institute of Agriculture and Natural Resources climatologist who heads the center are widely used by governments to create customized drought plans. The Web-based U.S. Drought Monitor, which IANR scientists developed in cooperation with federal agencies, is widely used nationwide. The monitor's Web site, which the center maintains, had 5 million visits in 2002. Building on this success, researchers plan to incorporate data from Canada and Mexico into a monthly North American Drought Monitor map in spring 2003. The center's work has helped shift drought planning nationwide from reactive crisis management to proactive risk management; 36 states now have drought plans, many based on the NU-developed drought planning tools.

Economic Development and Quality of Life for People and Communities
Topic: Nebraska Rural Poll Provides Rural Perspective

Issue:
State and federal public policy decisions often are made with little understanding of their impact on rural people.
What has been done?
To provide objective information on rural Nebraskans' views and concerns, a University of Nebraska rural sociologist launched the Nebraska Rural Poll in 1996. The scientific poll annually surveys 7,000 randomly selected residents in the state's 87 rural counties on issues related to public policy, community, work and quality of life. Results are analyzed and shared with state and federal lawmakers, decision-makers, the public and communities. In addition to a set of standing questions, researchers ask a few different questions each year that address pressing issues, such as taxation, farm policy or school consolidation. Results of rotating questions provide rapid feedback to decision-makers on these issues. Results over time also track trends and changes for rural Nebraskans and provide a rural perspective for policy discussions.
Impact:
This poll provides objective information about the needs and concerns of rural Nebraska. Decision-makers now use Nebraska Rural Poll results in policy decisions. Results have been included in testimony before several legislative hearings, and policy-makers say this information helps them make more informed decisions.

Nebraska Gov. Mike Johanns said: "As governor, I believe it is vital to stay in touch with the issues important to citizens in all parts of the state. The information compiled in the Nebraska Rural Poll will be a very useful tool as we make decisions which will affect rural Nebraska."

Chuck Hassebrook, program director for the Center for Rural Affairs, said: "The Rural Poll has been invaluable in transcending the babble of voices to show what rural people really want ..."
Funding:
Partnership for Rural Nebraska
NU Cooperative Extension
NU Agricultural Research Division
Hatch Act
Smith-Lever 3(b) & (c)

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Summary:
Policy-makers and community leaders have a better understanding of rural Nebraska concerns and opinions, thanks to the Nebraska Rural Poll. Launched in 1995 by an NU Institute of Agriculture and Natural Resources rural sociologist, the annual poll asks rural people's views on work, community, quality of life and public policy issues. Researchers quickly analyze and share results widely with state and federal lawmakers, decision-makers, the public and communities. This poll helps track trends and changes in rural Nebraska and provides a rural perspective for policy discussions. Decision-makers say this objective information helps them make better informed policy choices.
Economic Development and Quality of Life for People and Communities

Topic: Protecting Water Quality Along the Lower Platte River

Issue:
Groundwater and surface water along the Lower Platte River Valley of eastern Nebraska are especially vulnerable to contamination from everyday human activities because of the region's shallow water tables, sandy soil and development along the river and nearby lakes.

What has been done?
University of Nebraska Cooperative Extension and the Lower Platte River Corridor Alliance launched the Water Wellness program to help the region's non-farm residents learn how to identify water quality risks and protect water quality. The program emphasized the importance of properly managing septic systems, hazardous waste, storm water runoff and drinking water wells. More than a dozen educational meetings provided information for residents along the 100-mile flood plain in 2001 and 2002. About 360 people took voluntary, confidential water quality risk assessments that helped them identify potential wastewater or drinking water problems.

Impact:
Several homeowners identified ways to keep their water supplies safer, thanks to this program. A follow-up survey showed that 42 percent of respondents took action to protect their health and the environment. They installed drinking water treatment systems and new septic systems and had their septic tanks pumped more frequently. The survey also showed that participants' knowledge of safe water issues doubled as a result of the program, and they were much more willing to change their practices to reduce chances of contaminating water.

Funding:
NU Cooperative Extension
Lower Platte River Corridor Alliance
Smith-Lever 3(b) & (c)

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Summary:
Groundwater and surface water along the Lower Platte River Valley of eastern Nebraska are especially vulnerable to contamination from everyday human activities. An educational Water Wellness program offered by NU Cooperative Extension and the Lower Platte River Corridor Alliance in 2001 and 2002 helped the region's non-farm residents identify potential water quality risks. About 360 people took voluntary, confidential water quality risk assessments that helped them identify potential wastewater or drinking water problems. Several homeowners identified ways to keep their water supplies safer, thanks to this program. A follow-up survey found 42 percent of participants had taken steps to protect their health and the environment, and their knowledge of safe water issues doubled.

Economic Development and Quality of Life for People and Communities
Topic: Rural Women's Concerns

Issue:
Public policy choices affect rural residents, yet these decisions often are made with urban areas in mind.

What has been done?
As part of a five-year multistate study on rural women and welfare reform, University of Nebraska family scientists examined the lifestyles of 42 rural Nebraska women of all income levels. Researchers asked participants annually about child care, transportation and medical services in their communities as well as their jobs, incomes, expenses and spending habits. Early results show child care is a leading concern. There's also a great need for quality transportation because many rural Nebraska women drive at least 20 miles for medical care or shopping. Preliminary findings indicate rural women share many similar concerns and joys regardless of income.

Impact:
Results of this research will provide information about the impact and consequences of welfare reform on rural women. Findings also will provide general economic information to help policy-makers assess the rural impact of future policy decisions.

Funding:
NU Agricultural Research Division
Hatch Act

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Summary:
Public policy choices affect rural residents, yet such decisions often are made with urban areas in mind. To assess the rural consequences of welfare reform, NU family scientists studied the lifestyles of 42 rural Nebraska women of all income levels. Researchers interviewed participants about their concerns as well as jobs, incomes, expenses and spending habits. Early results showed child care is a leading concern for Nebraska women. Preliminary findings indicate rural women share many similar concerns and joys regardless of income. This study is part of broader multistate research that will provide information on welfare reform's impact in rural areas. Findings will provide information for policy-makers.

Economic Development and Quality of Life for People and Communities
Topic: Small Farm and Ranch Profitability Project

Issue:
Many small ranchers and farmers feel squeezed financially between mounting costs and the whims of commodity markets. Pursuing alternative markets can improve profits, but without solid market research and product development information, new ventures are risky.

What has been done?
University of Nebraska faculty lead a four-state effort that is identifying untapped, higher-value markets to improve small farm and ranch profitability and help alternative product ideas succeed. Launched in 1999, the North Central Initiative for Small Farm Profitability includes university researchers from Nebraska, Iowa State, Missouri and Wisconsin. Market research and case studies identify promising markets, provide vital market information and offer successful business models. The team has completed 32 case studies. Recent results highlighted the potential for supplying locally grown wheat and barley to craft breweries, producing specialty cheeses or selling locally grown food to groceries, restaurants and consumers. Organizers work with 32 producer clusters – groups of ag producers that guide research and share an interest in innovative alternatives to traditional agriculture.

Impact:
The initiative is providing market research and technical assistance to small producers that traditionally were available only to bigger businesses and at high cost. Producers are using this information in their value-added businesses to improve their chances of success. For example, technical assistance from the initiative helped a Nebraska producer group become licensed for pepper processing and led to creation of a Web site advertising the product.

A Wisconsin producer said: "We have definitely used the information from your research in putting together our cluster's business plan."

A Missouri producer said: "This is the type of information we can use when direct marketing our produce to customers."

Funding:
USDA IFAFS grant
NU Cooperative Extension
NU Agricultural Research Division
Hatch Act
Smith-Lever 3(b) & (c)

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Summary:
Tapping an alternative market can boost small farm or ranch profitability, but such new ventures are risky without solid marketing information and product research. An NU Institute of Agriculture and Natural Resources team is leading a four-state project that is identifying untapped, higher-value markets and providing information to help alternative product ideas succeed. The North Central Initiative for Small Farm Profitability provides case studies of successful businesses, market research, technical assistance and works closely with producer groups. This effort is providing small producers with market research and other information traditionally available only to bigger businesses at high cost. Producers are using this information in their value-added businesses to improve their chances of success. For example, technical assistance from the initiative helped a Sutherland producer group become licensed for pepper processing and led to creation of a Web site advertising the product.

Economic Development and Quality of Life for People and Communities
Topic: Technical Assistance for Geothermal Systems

Issue:
Using geothermal energy from the earth to heat and cool buildings offers the cleanest, most cost-effective energy source, according to the U.S. Environmental Protection Agency. However, detailed information about groundwater or underground conditions is key to successfully tapping this resource.

What has been done?
Geothermal systems tap the Earth's relatively constant temperature to help heat and cool. Some systems pump underground water and return it while others run antifreeze through buried tubing. The University of Nebraska-Lincoln's Conservation and Survey Division has the most detailed data about Nebraska's underground conditions. Its faculty interpret this information to help people properly locate geothermal exchange systems for schools, businesses, commercial districts, residential developments, private homes and towns.

Impact:
NU's technical assistance has been crucial to proper design and installation of 25 geothermal systems, which provide a cheaper, cleaner alternative to conventional gas or electric heating and cooling systems. They reduce dependence on fossils fuels, diminish greenhouse gas emissions and expand job opportunities for well drillers. The EPA estimates these systems save 40 percent to 60 percent on heating bills and 20 percent to 50 percent on cooling costs, depending on climate.

Funding:
UNL Conservation and Survey Division

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Summary:
Geothermal systems harness relatively constant temperatures underground for economical, environmentally friendly heating and cooling. Successful installation requires detailed information about groundwater or underground conditions. University of Nebraska geoscientists provide technical assistance to help properly locate geothermal-exchange heating and cooling systems. They've provided information for installation of about 25 systems in Nebraska. The U.S. Environmental Protection Agency estimates geothermal systems can reduce heating costs 40-60 percent and cooling costs 20-50 percent. They also reduce dependence on fossils fuels, diminish greenhouse gas emissions and expand job opportunities for well drillers.

Economic Development and Quality of Life for People and Communities
Topic: Building Nebraska Families

Issue:
People transitioning from welfare to work need important life skills to be successful as they assume work responsibilities, build self-sufficiency through money management and improve communications, parenting, nutrition and time management skills.

What has been done?
The University of Nebraska Cooperative Extension's Building Nebraska Families program teaches family management and life skills to people struggling to move from welfare to work. This program reaches out to people facing multiple obstacles to success, such as debt, low self-esteem, anger and little self-responsibility for improving their lives. It involves intensive one-on-one education to build self-sufficiency by improving money management, parenting skills, nutrition, communications and goal setting. Extension collaborated with Nebraska Health and Human Services to launch the program in 1999. It has grown from serving families in 12 counties to 52 rural Nebraska counties and currently has more than 120 active participants. Extension educators have worked with more than 350 families, reaching over 1,000 family members since the program began.

Impact:
Program graduates say that thanks to this education program, they continue to be employed, feel better about themselves, improved their time management and problem-solving skills and are able to earn more money at their jobs. The average income for participants after the program is $786 per month, compared with $452 upon entering. Some participants say that what they learned helped them turn their lives around. For example, one family lived in a dirty and rodent-infested house and couldn't get their daughter off to Head Start due to head lice and a desire to keep her home. The education the program provided helped the family no longer feel overwhelmed by their day-to-day tasks and helped them keep a clean home and get their daughter to Head Start.

Funding:
Nebraska Health and Human Services System
NU Cooperative Extension

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Summary:
The University of Nebraska Cooperative Extension's Building Nebraska Families program teaches family management and life skills to people struggling to move from welfare to work. Extension collaborated with the Nebraska Health and Human Services System to create this education program in 1999. Since then, Building Nebraska Families extension educators have worked one-on-one with more than 350 families, reaching over 1,000 family members through the intensive education program. Some participants say this program turned their life around. The average income for participants after the program is $786 per month, compared with $452 upon entering.
Economic Development and Quality of Life for People and Communities

Topic: Coping with Divorce

Issue:
Children often feel trapped between divorcing parents. They are confused, wonder what happened and worry they are to blame. Sometimes parents don't know how to help their children cope.

What has been done?
University of Nebraska Cooperative Extension leads workshops for parents and children to help them deal with divorce or other family changes. The six-hour Parents Forever workshop teaches parents things such as how children normally behave during divorce and what to say to their children. Some judges dealing with divorce cases, custody hearings or paternity suits now require parents with children under 18 to attend the workshops, which extension offers in several Nebraska judicial districts. Since its beginning in 1999, 600 adults who are parents of 800 children have taken the workshops.

A companion program called Kids Talk About Divorce is offered for children ages 5 to 18. It teaches coping skills, how to recognize the stages of grief and loss, anger management and how to interact with parents on emotional issues. About 250 children have participated.

Impact:
Judges in one judicial district report a decrease in the number of families returning to court for minor disputes and custodial modifications after they participate in Parents Forever. Parents report that their children show less confusion about the divorce and are better able to talk about their feelings. The children are trying to use appropriate anger management techniques and often remind their parents of skills they have learned. One child said, "We learned that we shouldn't be put in the middle. Our parents should be the ones talking to each other. We shouldn't have to be the messengers."

Funding:
NU Cooperative Extension
Nebraska Children and Families Foundation
Nebraska Crime Commission
Smith-Lever 3(b) & (c)

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Summary:
When their parents divorce, children sometimes need help understanding and coping, and parents may not know what to do. NU Cooperative Extension's Parents Forever workshops for adults and Kids Talk About Divorce programs for children help families work through these difficult changes. Since 1999, about 600 parents and 800 children have participated in Parents Forever, while Kids Talk About Divorce has reached about 250 children. Some judges now require parents with children under 18 to attend Parents Forever in the event of divorce, custody modification or paternity suits. Judges in one judicial district say they have seen a decrease in the number of families returning to court after completing the program. Parents report that children are less confused about the divorce and are better able to discuss their feelings.

Economic Development and Quality of Life for People and Communities
Topic: Food Processing Center Entrepreneurship Services

Issue:
When it comes to starting a business, the idea is the easy part. The University of Nebraska Food Processing Center Food Entrepreneur Assistance Program helps entrepreneurs develop an idea into a successful venture.

What has been done?
The Food Processing Center offers technical and marketing/business development assistance to entrepreneurs and established food processing firms. The center has helped Nebraska's food processing industry grow from 220 businesses when it opened in 1983 to nearly 400 today. Through the Food Entrepreneur Assistance Program, the center offers Product to Profit seminars and individualized assistance to get a business up and running. Participants receive help in many areas, including product testing, label and packaging design, supplies and marketing.

Impact:
The Food Entrepreneur Assistance Program can help save participating businesses an average of about $20,000 in startup costs. Since the program began in 1989, it has helped 120 companies start. Sixty-six percent remain in business, compared with a national success rate of 50 percent to 60 percent for all small businesses. One entrepreneur said he knew his spice blend was a hit with family and friends but had no idea of how to get it in the marketplace. "They helped me with labeling, packaging, pricing of my product ... everything I needed to get my businesses off the ground."
Funding:
U.S. Department of Commerce
USDA special appropriation
Private sector funding
NU Cooperative Extension
NU Agricultural Research Division
Hatch Act
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Summary:
When it comes to starting a business, the idea is the easy part. The University of Nebraska Food Processing Center helps entrepreneurs develop an idea into a successful business. Since it opened in 1983, the center has helped Nebraska's food processing industry grow from 220 businesses to nearly 400 businesses. Through the center's Food Entrepreneur Assistance Program, participants receive help with things such as product testing, labeling and marketing, which can save businesses about $20,000 in startup costs. Sixty-six percent of the program participants remain in business, compared with a national small business success rate of 50 percent to 60 percent. One entrepreneur said he knew his spice blend was a hit with family and friends but had no idea of how to get it in the marketplace. "They helped me with labeling, packaging, pricing of my product ... everything I needed to get my businesses off the ground."
Economic Development and Quality of Life for People and Communities
Topic: Giving Entrepreneurs an EDGE

Issue:

Creating jobs is essential to the survival and growth of Nebraska's small towns. A University of Nebraska Cooperative Extension program gives some rural entrepreneurs an edge in creating successful businesses.

What has been done?
The Nebraska EDGE — Enhancing, Developing and Growing Entrepreneurs — program offers skill-based training for people who want to start or expand a business or improve their business skills. EDGE classes are taught by entrepreneurs. Participants learn legal structures, market strategies, financial statements, bookkeeping, cash flow, financing and how to manage growth. Extension works with community sponsors, foundations and course instructors to provide the program. In 2000, EDGE added the Tilling the Soil of Opportunity course to help agricultural producers who want to start a side business or direct market a product.

Impact:
Since 1993, nearly 1,500 existing and potential business owners have participated in EDGE. About half of those participants started or expanded their businesses, creating more than 650 new jobs, mostly in rural communities. One recent EDGE participant restructured his computer business and boosted his profits by $35,000 annually. Another participant said business has grown 55 percent since he took the course in 1996 – that's a 10-15 percent annual growth rate.

Funding:
NU Cooperative Extension
Nebraska Microenterprise Partnership Fund
Nebraska Department of Economic Development
Local community coalition support
Smith-Lever 3(b) & (c)

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Summary:
Creating jobs is key to growing and sustaining Nebraska's small communities. A University of Nebraska Cooperative Extension program helps rural and small-town residents start or expand small businesses. The Nebraska EDGE — Enhancing, Developing and Growing Entrepreneurs — training courses are taught by entrepreneurs for entrepreneurs. Since EDGE began in 1993, nearly 1,500 existing and potential Nebraska business owners have participated. About half of them started or expanded their businesses, creating more than 650 new jobs, mostly in rural communities. One recent EDGE participant restructured his computer business and boosted his profits by $35,000 annually. Another participant said business has grown 55 percent since he took the course in 1996 – that's 10-15 percent growth annually.

Economic Development and Quality of Life for People and Communities
Topic: Meat Plants Changing Rural Communities

Issue:
Meat processing plants typically bring economic growth, rapid change and new residents to the rural communities where they operate. These changes often create tensions that leave longtime and new residents alike frustrated by divisions and communication barriers posed by different languages and cultures.

What has been done?
University of Nebraska researchers are examining the meat processing industry's economic, social and physical impacts on communities and their residents. They are working directly with three Nebraska communities where meat processing is a major employer to identify issues important to long-term and immigrant residents alike. Issues include availability of community resources, job training, housing and education. Face-to-face interviews in 2000 and 2001 revealed longtime residents and newcomers share similar concerns about rapid demographic changes altering their communities. The next step is to interview residents in meat packing towns in several other Midwestern states.

Impact:
Meat processing is changing the face of rural America. This research is helping communities develop strategies to handle rapid changes and promote cooperation between culturally diverse populations that ultimately will impact community viability.

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

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Summary:
Meat packing plants are changing rural communities. A plant brings economic growth, rapid change and new residents to a community. NU Institute of Agriculture and Natural Resources researchers are examining the meat processing industry's economic, social and physical impacts on communities and their residents. They are working directly with three communities to identify issues important to long-term and immigrant residents alike. Issues include availability of community resources, job training, housing and education. This research will help communities develop strategies to handle rapid changes and to promote cooperation between culturally diverse populations.

Economic Development and Quality of Life for People and Communities
Topic: New Beef Products Add Value

Issue:
Several new beef products developed from traditionally undervalued portions of the beef chuck and round are sparking industry and consumer interest. The science behind these new cuts is rooted in land-grant university research.

What has been done?
Meat scientists at the University of Nebraska's Institute of Agriculture and Natural Resources and University of Florida analyzed more than 5,500 muscles in the beef chuck and round to learn which might be better used. They identified higher value potential in numerous muscles traditionally used for ground beef or roasts. Nebraska scientists compiled findings in a CD-ROM and comprehensive booklet industry can use to identify promising muscles for new products. They have worked closely with the National Cattlemen's Beef Association and industry to call attention to these muscles' potential.

In 2002, researchers shared with industry the findings from their latest muscle profiling research, this one examining the higher value potential of meat from older cows. This study also identified untapped potential in several muscles in older cows.

Impact:
The beef industry has used the original muscle-profiling research findings to create innovative, higher-value products that offer economical new cuts for cost-conscious consumers and boost carcass value. The best known of NCBA's new Beef Value Cuts is the flat iron steak, which now can be found in restaurants and at meat counters. The industry also introduced other new products, such as tender medallions and the ranch cut steak, based on this research. These new cuts sell for $2.99 to $5.99 per pound, compared with roasts and ground beef that typically bring about $1.19 to $1.99 per pound.

An official for a Nebraska-based food company that markets nationally and internationally said this research adds value to the beef carcass and benefits all aspects of the industry. The flat iron steak is a growing part of the company's business.

Funding:
Cattlemen's Beef Board
Nebraska Beef Council
NU Agricultural Research Division
Hatch Act

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Summary:

Several new, higher-value beef products are creating excitement in industry and helping to boost consumer demand for beef. The science behind these new cuts comes from University of Nebraska research. Meat scientists studied more than 5,500 muscles in the beef chuck and round and identified higher value potential in muscles traditionally used for ground beef or roasts. Collaboration with the National Cattlemen's Beef Association and industry is helping translate the findings into innovative, higher-value products to provide economical new cuts for cost-conscious consumers and increase carcass value. The best known of the new products is the flat iron steak but several others, such as tender medallions, are becoming more widely used. These cuts sell for $2.99 to $5.99 per pound, compared with roasts and ground beef that typically bring about $1.19 to $1.99 per pound.

Economic Development and Quality of Life for People and Communities
Topic: Panhandle Chicory Production

Issue:
Farmers, agribusiness people and ag scientists are always looking for potential new crops to diversify cropping options and perhaps boost a region's economy. It's a long shot. Identifying promising crops isn't enough for success. There also must be a market.

What has been done?
Since 1995, University of Nebraska Institute of Agriculture and Natural Resources researchers and extension specialists have studied chicory's potential as a new crop for the Panhandle. Chicory is grown widely in Europe but not in the United States. NU researchers determined how best to plant, tend and harvest this root crop and showed chicory could be profitably grown in the region. The IANR team also worked with area farmers and businesses to help establish a fledgling chicory industry.

Impact:
In 2002, about 1,000 acres of chicory grown in the Panhandle were processed for use in pet food at a privately owned plant at Scottsbluff. The $2 million U.S. Chicory plant opened in 2001 as the nation's only chicory processing plant and provides 25-50 seasonal jobs. Panhandle chicory production is expected to increase to as much as 10,000 acres by 2005. Yields average 19 tons of root per acre and bring about $55 per ton. If 10,000 acres were planted, growers would gross about $10 million.

Funding:
NU Agricultural Research Division
NU Cooperative Extension
Hatch Act
Nestle Corp.
U.S. Chicory
Smith-Lever 3(b) & (c)

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Summary:
The chicory industry developing in Nebraska's Panhandle is rooted in six years of University of Nebraska agricultural research. NU Institute of Agriculture and Natural Resources scientists and Cooperative Extension specialists at the Panhandle Research and Extension Center in Scottsbluff have studied the root crop's potential since 1995. They learned how best to plant, tend and harvest chicory and showed it could be grown profitably in the region. In 2002, about 1,000 acres of chicory grown in the Panhandle were harvested and processed at U.S. Chicory's new processing plant at Scottsbluff. The plant, which opened in 2001, provides 25-50 seasonal jobs. Panhandle chicory acreage could increase to 10,000 acres by 2005, which could gross $10 million for growers.

Economic Development and Quality of Life for People and Communities
Topic: Sandhills Leadership Program

Issue:
Declining populations, school consolidations and other challenges can leave rural areas short on people who are prepared and willing to get involved with local issues and become community leaders.

What has been done?
The Sandhill's Leadership Program was launched by University of Nebraska Cooperative Extension educators in 1997 with a Nebraska Forest Service grant. Training gives residents in seven sparsely populated counties the skills they need to become effective community leaders. The program is open to everyone from high school students to senior citizens. Participants meet one day each month from September through April and address ethical leadership, personal and professional development and community issues.

Impact:
This program is building a cadre of Sandhills leaders, including high school students who are discovering their leadership abilities. So far 65 people have graduated from the program and 12 more are expected to complete the program in 2003. Surveys from the past five years indicate participants were better able to accept other viewpoints and express their ideas more clearly. They report that they are better able to identify their strengths, have more interest in local issues and are more willing to accept leadership roles within their community. Ninety percent report that the program made a positive difference in their lives.

One senior citizen wanted to learn to be a leader but feared public speaking. Thanks to the course, she speaks up regularly after being elected to her local village board. "I would never have done it otherwise," she said. For another participant, "This opened our eyes to the value of community." Many students who have taken the course while in high school are taking leadership roles in college.

Funding:
Nebraska Forest Service
Participant fees
NU Cooperative Extension
Smith-Lever 3(b) & (c)

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Summary:
Declining populations and other challenges can leave rural areas short on people who are ready and willing to get involved with community issues and problems. University of Nebraska Cooperative Extension is building a cadre of community leaders in seven sparsely populated counties through the Sandhills Leadership Program. Launched in 1997 with a Nebraska Forest Service grant, the program is open to everyone from high school students to senior citizens. Participants learn about ethical leadership, personal and professional development and community issues. Ninety percent of the 65 graduates from the program report the program has made a positive difference in their lives. A survey showed they are better able to accept other viewpoints and express their ideas and have more interest in local issues. One senior citizen wanted to learn community leadership but feared public speaking. Thanks to the course, she now speaks up regularly after being elected to her local village board. "I would never have done it otherwise," she says.

Economic Development and Quality of Life for People and Communities
Topic: Technologies Across Nebraska

Issue:
Unless rural residents understand and harness information technology, they risk missing out on the potential for economic and educational development this technology offers.

What has been done?
University of Nebraska Cooperative Extension, in partnership with the Nebraska Information Technology Commission (NITC), leads Technologies Across Nebraska. This initiative educates and boosts awareness about information technology's importance in rural communities. Extension collaborates with more than 40 organizations, agencies and educational systems on this effort. Eight extension educators are working with communities and teaching Internet-based classes around the state to lead the educational effort. As part of this effort, eight communities received $2,500 NITC grants to explore their information technology needs, with extension educators providing local leadership. IT extension educators also are helping communities assess the importance of broadband Internet access and educate local residents.

Impact:
Communications technology has the potential to help communities and businesses across Nebraska compete globally, expand educational opportunities and be more profitable. This initiative is helping rural communities assess, plan for and meet their information technology needs. As a result, several communities and at least two counties have completed plans to provide broadband access for all residents.

Funding:
NU Cooperative Extension
University of Nebraska
Nebraska Information Technology Commission
Smith-Lever 3(b) & (c)

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Summary:
A collaborative effort is helping rural Nebraskans better understand and harness information technologies to expand their educational and economic opportunities. University of Nebraska Cooperative Extension and the Nebraska Information Technology Commission (NITC) lead the Technologies Across Nebraska Partnership, a collaboration of more than 40 groups. This initiative works to increase rural awareness of information technology's potential and importance and to support communities making technology decisions. Eight extension educators are working with communities, individuals, businesses and counties across the state on information technology issues. Eight communities are using $2,500 NITC grants to determine their technology needs, with extension educators providing local leadership. Thanks to this initiative and extension's efforts, several communities and at least two counties already have completed plans for residential broadband access.

Society-Ready Graduates
Topic: Animal Welfare Class

Issue:
Animal welfare issues can be emotional, controversial and political. Students who learn how to argue their viewpoints based on facts and research instead of emotion and personal convictions are likely to be more effective handling real-world controversies.

What has been done?
An animal welfare class at the University of Nebraska-Lincoln teaches students to think about, prepare for and discuss controversial issues. Students are assigned to research different viewpoints related to real-life animal welfare issues in research, food, sport and product testing. Students prepare budgets and study demographics of different constituencies. They play the roles of policy analysts, spokespeople and lobbyists to argue their perspectives. The class culminates with mock congressional hearings held jointly with a class at Kansas State University. Students on the two campuses prepare testimony via Internet 2 classrooms, then meet at one of the campuses to hold the hearing. Faculty from both universities play the role of congressional committee members.

Impact:
This class gives students a taste of the politics behind animal welfare issues and helps them understand how to handle controversy more effectively. Participants say this class helped them learn to work with people with differing convictions and viewpoints and to base their own arguments on research instead of personal beliefs.

Funding:
UNL College of Agricultural Sciences and Natural Resources
UNL Department of Animal Science
KSU Department of Animal Science
Nebraska Farm Bureau
Kansas Farm Bureau

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Summary:
Today's agricultural issues can be complex and sometimes controversial. Students get a taste of politics and learn to more effectively present their viewpoints on controversial issues in a UNL College of Agricultural Sciences and Natural Resources animal welfare class. The class teaches students how to research their viewpoints, to base their arguments on facts instead of emotion and how to work with people with differing opinions. Participants learn about political processes and are better prepared to address controversial issues that may arise in their careers. The class culminates with mock congressional hearings, held jointly with a class at Kansas State University.

Society-Ready Graduates
Topic: Employment Seminar

Issue:
Students preparing for graduation and real-life careers often are at a loss about how to prepare a resume, research a company and sell themselves in a job interview.

What has been done?
The University of Nebraska-Lincoln's College of Agricultural Sciences and Natural Resources offers an employment seminar course to help students learn the ropes of finding a job. The course, offered one night a week for the first seven weeks of each semester, teaches students to write resumes and cover letters, research companies and prepare for interviews. Students participate in mock interviews, listen to panel discussions with agricultural industry leaders and learn business dining etiquette. More than 70 students, freshmen through seniors, participated in the 2002-03 academic year.

Impact:
The seminar has earned praise from both students and industry leaders. Students report they feel more ready to start their careers because the course helped them get better prepared and polish their interview skills. Employers say seminar participants are more effective in interviews than other students. One company representative conducting a mock interview was so impressed with a seminar student that the company wound up hiring the student even though the interview was supposed to be a dry run.

Funding
UNL College of Agricultural Sciences and Natural Resources

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Summary:
Students nearing college graduation sometimes feel unprepared to start their careers. The UNL College of Agricultural Sciences and Natural Resources students get a leg up on their job search and careers thanks to a college-sponsored employment seminar. The seven-week course teaches students how to write a resume and cover letter, research companies and participate in interviews. Students who have taken the seminar report that they feel better prepared to find a job; prospective employers who conduct mock interviews say seminar participants are better prepared than other students. One company representative conducting a mock interview was so impressed with a seminar student that the company wound up hiring the student even though the interview was supposed to be a dry run.

Society-Ready Graduates
Topic: Entomology Distance Education Master's Degree

Issue:
Many people who want to further their education can't participate in an on-campus degree program because of family and job commitments or because they live far from a campus. To serve their needs, universities must find innovative ways to bring education to lifelong learners.

What has been done?
The University of Nebraska-Lincoln's Department of Entomology began its distance education master of science degree program in 1997 with one course, an advanced undergraduate/graduate course in entomology and pest management. In the five years since, the program has grown to 13 courses available via distance technologies including video, CD-ROM and the Internet. The College of Agricultural Sciences and Natural Resources program is aimed at nontraditional students such as agricultural professionals, crop consultants, pest control operators and high school science and biology teachers. All courses can be taken for credit or noncredit. The degree requires 36 credit hours of graduate-level course work and typically takes 2 1/2 to 4 years to complete. The distance program was honored in 2002 with the American Distance Education Consortium's Educational Program Award. Also, two of the courses were finalists for national Telly awards, and faculty have received regional and national awards for teaching excellence.

Impact:
This program expands opportunities for place-bound students to continue their education, improve their skills and prepare for job advancement. Eight students have graduated from the program, with three more scheduled to graduate in May 2003. Eighty-six students from 30 states and five countries currently are enrolled. About half the students are in science education and about 40 percent are associated with agriculture or public health. Forty-five percent of enrollees are women; a key goal of the program is to increase the enrollment of women, traditionally under-represented in graduate science programs.

Funding:
UNL College of Agricultural Sciences and Natural Resources

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Summary:
Nontraditional students from across the United States and beyond can earn a master's degree in entomology without spending time on campus. The University of Nebraska-Lincoln's Department of Entomology began its distance education master of science degree program in 1997 with one course. Aimed at off-campus students who are place-bound by family or job commitments, the program has grown to 13 courses available via distance technologies including video, CD-ROM and the Internet, with 36 credit hours required for a degree. The courses also are available for noncredit. Eight students have graduated from the program, with three more to graduate in May 2003. Eighty-six students from 30 states and five countries currently are enrolled. Forty-five percent of enrollees are women; a key goal of the program is to increase the enrollment of women, traditionally under-represented in graduate science programs.

Society-Ready Graduates
Topic: Feedlot Management Specialization Internship

Issue:
The cattle feeding business gets more complex every year and the industry needs qualified young people interested in feedlot management careers.

What has been done?
The University of Nebraska-Lincoln's feedlot management specialization internship is an intensive seven-month course that prepares students for feedlot management or related careers. This College of Agricultural Sciences and Natural Resources course is designed for students who have completed other undergraduate course work and provides up to eight hours credit. Through classroom discussions with industry experts and four months interning at a commercial feedlot, participants learn all facets of the feedlot business. More than 70 students have completed the internship since it began in 1988 in response to a shortage of young people considering careers in the feedlot industry.

Impact:
This program has helped meet a pressing need for qualified young people to work in Nebraska's feedlot industry. Most of the program participants have gone on to management and leadership roles in the beef industry. For example, a Nebraska feedlot manager who completed the program about 10 years ago as a student now works with interns in his feedlot. "My experience in the internship built contacts in the industry that I still use," he said. "... We have hosted several interns because we feel it is a valuable experience for everyone involved."

Funding:
UNL College of Agricultural Sciences and Natural Resources

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Summary:
The feedlot business gets more complex every year and the industry needs qualified young managers. UNL's feedlot management specialization internship helps meet that demand. The intensive seven-month program prepares students for feedlot management or related careers. This College of Agricultural Sciences and Natural Resources course helps participants explore all facets of the feedlot business through classroom discussion and hands-on experience working at a commercial feedlot. More than 70 students have completed the internship since it began in 1988 and many now work in the state's beef industry. A Nebraska feedlot manager who completed the internship about 10 years ago says he still uses the industry contacts and knowledge gained through the internship.

Society-Ready Grads
Topic: Food Product Development Class

Issue:
Book learning is important but nothing beats firsthand experience. Students who combine hands-on and classroom experience are best prepared for their work and careers.

What has been done?
Students in a University of Nebraska-Lincoln food product development class combine critical thinking, problem-solving and teamwork to create a new food product. Instead of books, lectures and exams, students research and develop a new food product from start to finish during the semester. Mimicking what goes on in product development in industry, they apply what they learned in food engineering, chemistry, microbiology and other classes. Teams identify potential products and pitch ideas to classmates. The class selects and develops one product with teams working through every step from formulating and processing to packaging, food safety and marketing. Products often are entered in food development contests, which gives companies a chance to see the product and students a chance to learn about job opportunities.

Impact:
Students say they are better prepared for their food industry careers, thanks to this class. Food companies who hire UNL students agree.

Funding:
UNL College of Agricultural Sciences and Natural Resources

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Summary:
Students in a University of Nebraska-Lincoln food product development class combine critical thinking, problem-solving and teamwork to create a new food product. Students research and develop a new food product from start to finish during the semester, mimicking the product development process in industry. Products often are entered in food development contests, which gives companies a chance to see the product and students a chance to learn about job opportunities. Students say this hands-on experience better prepares them for their food industry careers.

Society-Ready Grads
Topic: Innovative Uses for Soybeans

Issue:
For growers, developing new uses for soybeans expands demand and could boost prices for their crop. For students, inventing new products from the widely grown Nebraska crop provides great experience that could give them a leg up on their careers.

What has been done?
Since 1999, the University of Nebraska-Lincoln's Industrial Agricultural Products Center and the Nebraska Soybean Board have teamed up to offer the Innovative Uses of Soybeans Contest. The contest, open to all Nebraska college and university students, offers cash awards for the best new soy product invention. Students can work with faculty advisors on projects. The program encourages students to use their creativity, classroom learning and problem-solving skills as well as to explore their entrepreneurial skills. University of Nebraska-Lincoln students have consistently swept the competition. Recent winners include soy-based lip balm, an environmentally friendly automotive care product, an improved soy-based irrigation lubricant, and soy-based pudding and gelatin. The irrigation lubricant's inventor is pursuing a patent through the university; others have received additional funds for market research on their product or are exploring commercialization.

Impact:
Students say this contest provides an opportunity to apply what they'd learned in their studies to create new products and to develop valuable work skills. If commercialized, these new products also will expand demand for soybeans.

Funding:
Nebraska Soybean Board
UNL Industrial Agricultural Products Center

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Summary:
From soybean-based irrigation drip oil to new kinds of soy-based foods, University of Nebraska-Lincoln students have come up with some winning ideas for new soy products. UNL's Industrial Agricultural Products Center teams with the Nebraska Soybean Board on the annual Innovative Uses of Soybeans Contest, which offers students at all Nebraska colleges and universities a chance to invent new soy products. UNL students have won the contest since it began in 1999. Winners have included soy-based lip balm, an environmentally friendly automotive care product, an improved soy-based irrigation lubricant, and soy-based pudding and gelatin. Some winners are pursuing a patent; others are exploring commercialization. Students say the process of developing a new product helps them hone skills that will serve them well in their careers. If commercialized, these products could increase demand and the value of Nebraska soybeans.

Society-Ready Graduates
Topic: Pollution Prevention Internship

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

What has been done?
Through NU's 11-week Partners in Pollution Prevention summer internship program, engineering students work with manufacturers and small businesses to identify ways to reduce waste and pollution. Since 1997, 81 interns have worked with 260 Nebraska businesses, including printers, dry cleaners, car repair shops, farm cooperatives and metal finishing businesses. Each business receives a confidential written report outlining recommendations, cost/benefit estimates and other information about how to reduce waste. The program gives students from Nebraska and other states practical experience, a paycheck and college credit. Manufacturers benefit from having "new eyes" scrutinize operations to reduce waste and pollution. The internship is headed by faculty in UNL's Department of Biological Systems Engineering in cooperation with NU Cooperative Extension and other agencies.

Impact:
Based on responses from 43 business participants, following intern recommendations each year has the potential to: divert 3.7 million pounds of solid waste from landfills; reduce hazardous waste by 24,500 gallons; and potentially save $561,000 annually. Interns, as future biological, civil and chemical engineers, benefit by working with professionals and getting a sense of how the business world operates. They improve their technical, research and presentation skills while earning a stipend and three credit hours.

Funding:
NU Cooperative Extension
U.S. Environmental Protection Agency Region 7
Nebraska Department of Environmental Quality
NU Center for Infrastructure Research
Smith-Lever 3(b) and (c)
UNL College of Engineering and Technology
UNL Water Center

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Summary:
Nebraska businesses get advice on reducing waste and pollution and students get valuable real-world experience through the University of Nebraska-Lincoln's Partners in Pollution Prevention internship. Students have enthusiasm and time to see situations with "new eyes" and make recommendations to help businesses and industries reduce waste and disposal costs. Since 1997, 81 interns from Nebraska and elsewhere have helped 260 businesses, each year potentially diverting 3.7 million pounds of solid waste from landfills, reducing 24,500 gallons of hazardous waste and saving $561,000. Students benefit by working with professionals and getting a sense of how the business world operates. They improve their technical, research and presentation skills, while earning a stipend and class credit.

Society-Ready Graduates
Topic: Student Development Initiative

Issue:
Most of today's college students can expect to change careers several times during their work lives. Change is a given and those who are best prepared to cope with, embrace and lead change are most likely to succeed.

What has been done?
The University of Nebraska-Lincoln's College of Agricultural Sciences and Natural Resources launched a Student Development Initiative to help students build leadership skills, get a better-rounded education and become comfortable with change. This initiative combines classroom learning with internships, international study, career shadowing, mentoring and volunteer work. Students work with faculty mentors to identify learning opportunities that address areas or skills each student wants to strengthen. Two departments are piloting the initiative's curriculum with 27 students. Organizers hope it will be expanded college-wide in the future.

Impact:
Initiative organizers say they expect participating students will be more comfortable with change in their workplace and in their communities, and the well-rounded experience will prepare them to be leaders in their communities and at work.

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UNL College of Agricultural Sciences and Natural Resources

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Summary:
Most of today's college students can expect to change careers several times during their work lives. To better prepare students to handle change and develop well-rounded skills that will help them succeed, the University of Nebraska-Lincoln's College of Agricultural Sciences and Natural Resources launched a Student Development Initiative. It combines classroom and experiential learning with volunteer work matched to students' needs. Two departments are piloting the initiative's curriculum with 27 students. Organizers hope it will expand college-wide in the future. The goal is to help students prepare professionally and personally to succeed and lead in an ever-changing world.

Society-Ready Graduates
Topic: Agricultural Science Magnet Schools

Issue:
Modern agriculture encompasses far more than working on a farm or ranch. Agribusinesses are eager for employees who are knowledgeable about agriculture. That's especially true in Nebraska, where one in four jobs depends on agriculture.

What has been done?
In 1999, the University of Nebraska Institute of Agriculture and Natural Resources was part of a broad partnership that helped develop the nation's first rural agricultural sciences magnet high school – a school within a school – at Mead, Neb. Four agricultural science courses from the Mead school now are offered via distance learning to seven rural schools. The team that launched the first school helped Burwell, Laurel-Concord and Nebraska City develop similar programs in 2001-02. This team – including NU Cooperative Extension educators and IANR faculty – collaborates to enhance ag-related course work. Each school then matches local interests and resources to better prepare students for ag-related careers.

Impact:
The enhanced ag-related course offerings and distance education in agricultural sciences are helping students explore and prepare for careers in agriculture, which could mean more students might remain in or return to rural communities to work after high school or college. Interest in ag-related courses is growing at these schools. For example, at Mead, senior students' attitudes about ag-related careers and investing in their communities has improved significantly since implementing the ag magnet courses. At Burwell High, agri-science and agribusiness enrollment increased by 80 percent in 2002-2003, thanks to curriculum changes.

Funding:
Participating schools

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Summary:
More Nebraska high school students are exploring and preparing for possible careers in agriculture thanks to expanded ag-related courses and specialized ag magnet schools. NU Institute of Agriculture and Natural Resources staff were part of a team that helped develop the nation's first rural agricultural sciences magnet high school at Mead, Neb. Building on this success, the team helped Burwell, Laurel-Concord and Nebraska City develop similar programs in 2001-02. This expanded agri-science and agribusiness curriculum gives students a leg up on their careers or college and may encourage some to remain or return to their hometowns after graduation. At Mead, senior students' attitudes about ag-related careers and investing in their communities has improved significantly since the ag magnet curriculum was implemented. At Burwell High, enrollment in agri-science and agribusiness increased by 80 percent in 2002-2003.

Society-Ready Graduates
Topic: America's Farm

Issue:
Aerial and satellite imagery, the Internet and Web cameras all can provide a wealth of ag-related educational information, but teachers need help knowing how to use it in the classroom.

What has been done?
Teachers nationwide tap information about agriculture, check out happenings at a farm and improve their teaching skills via a nationwide Internet-based education course called America's Farm. It's a partnership between NASA and the University of Nebraska-Lincoln's Center for Advanced Land Management and Information Technologies. The America's Farm Web site, featuring aerial and satellite imagery, Web camera shots and other information from the NU Research and Development Center's farm plots has drawn more than 1 million visits. A University of Nebraska at Omaha distance education class shows teachers how to develop lessons using NASA and university data to help children learn about agriculture and improve problem-solving skills. Nearly 200 science, social studies, art, technology and vocational-agriculture teachers have completed the course or related online workshops since it began in summer 2000.

Impacts:
Teachers representing 45 school districts nationwide gave the course a 97 percent overall approval rating. Ninety-four percent say they will use some course components in their instruction. Teachers say they use the course's teaching strategies to increase student appreciation for agriculture and boost their problem-solving skills. Offering the class via the Internet makes this training accessible to teachers who aren't near college campuses.

Funding:
National Aeronautics and Space Administration

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Summary:
Teachers nationwide can tap information about agriculture, check out happenings at a farm and improve their teaching skills via an Internet-based course called America's Farm. It's a teacher training partnership between NASA and the University of Nebraska-Lincoln's Center for Advanced Land Management and Information Technologies. The University of Nebraska at Omaha offers the distance education course. It features airborne and satellite imagery, Web camera shots and other information from the NU Research and Development Center's farm plots. Educators learn to use this data to teach children about science, agriculture and problem-solving. Teachers give the course a 97 percent approval rating and say the techniques help them teach problem-solving skills and boost students' appreciation for agriculture. Nearly 200 teachers have completed the course or related online workshops since it began in summer 2000. Teachers say offering the class via the Internet makes training accessible to teachers no matter where they live.

Society-Ready Grads
Topic: Bug Bash

Issue:
Getting students interested in science and scientific careers is important in today's science and technology-driven world.

What has been done?
Bug Bash is an educational outreach program of the University of Nebraska-Lincoln's entomology department that provides hands-on learning about science. Faculty and graduate students teach high school students about insects. These students, in turn, teach what they have learned to fourth-grade students. High school students learn to manage interactive teaching stations that offer interest-grabbing educational activities such as cockroach races, a live honeybee demonstration and colorful insect trading cards. The program is offered at Lincoln's Folsom Children's Zoo in collaboration with Lincoln Public Schools' Science Focus program. Since 1997, more than 480 high school presenters have offered Bug Bash information to more than 15,000 elementary students.

Impact:
Bug Bash gets consistently high marks from students and teachers alike for making science interesting, accessible and understandable. A survey of participating teachers found 94 percent said the experience stimulated student interest in science, 94 percent got new ideas to use in the classroom and 67 percent did follow-up science learning activities related to Bug Bash.

Funding:
NU Institute of Agriculture and Natural Resources
NU College of Agricultural Sciences and Natural Resources
NU Cooperative Extension Division
Peter Kiewit Foundation
Smith-Lever 3(d)
Cargill
Southeast Nebraska Beekeepers Association

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Summary:
From cockroach races to monarch butterfly tagging, students learn about science and scientific careers firsthand from a University of Nebraska-Lincoln entomology department outreach program. Bug Bash features a week of hands-on teaching and learning for students and teachers. The entomology department partners with Lincoln's Folsom Children's Zoo and Lincoln Public Schools to offer Bug Bash. Since 1997, more than 480 high school presenters have relayed the information they learned during Bug Bash to more than 15,000 elementary students. Bug Bash gets consistently high marks from students and teachers for making science interesting, accessible and understandable. A survey of participating teachers showed 94 percent think the experience stimulated interest in science, 94 percent got new ideas to use in the classroom and 67 percent did follow-up science learning activities related to Bug Bash.

Society-Ready Graduates
Topic: Nebraska Beef Team

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

What has been done?
To help consumers learn about beef while they're shopping, the University of Nebraska and the state's beef industry in 1998 established the Nebraska Beef Team, the first of its kind in the nation. A team of 12 College of Agricultural Sciences and Natural Resources students is trained to educate customers about beef in urban supermarkets. Team members set up information booths near meat counters, where they answer questions, explain uses for different beef cuts and offer money-saving tips, recipes, and food safety and nutrition information.

The program is a national model; team organizers have trained people in six other states to create similar programs. The team is a joint effort of NU's Institute of Agriculture and Natural Resources, the Nebraska Beef Council and several county cattlemen's affiliates.

Impact:
Students and consumers both benefit from the team's work. Consumers say students provide them the information and confidence to select and successfully prepare new beef cuts. Students say they get firsthand experience in communications, consumer education and teamwork.

A 2000 NU graduate said skills gained from the Beef Team enhanced his experience as a Fulbright Scholar. Today, he taps those communications skills in his career with ConAgra Foods. He said his company "values individuals who are motivated, good communicators and team players. The Beef Team contributes to the development of these and many more skills."

Funding:
Nebraska Beef Council
Harry Knobbe, West Point cattle feeder
Darr Feedlots of Cozad
Cuming County Livestock Feeders

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Summary:
The Nebraska Beef Team helps consumers learn to better use beef in their menus by providing information in supermarkets. The team of about 12 University of Nebraska-Lincoln College of Agricultural Sciences and Natural Resources students is trained to educate shoppers about beef selection, cooking, nutrition and food safety. The team, a partnership between the state's beef industry and NU's Institute of Agriculture and Natural Resources, was the first of its kind when it began in 1998. It's a national model and organizers have trained people to establish similar programs in several states. The program is a hit with consumers who say they're prepared to try new beef cuts and dishes thanks to the team's help. Students learn firsthand the communications, teamwork and other skills they'll use in their careers. One former team member said skills gained from the Beef Team enhanced his experience as a Fulbright Scholar and now are helpful in his job with ConAgra Foods.