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IANR

University of Nebraska Lincoln

IANR SUCCESSES

Institute of Agriculture and Natural Resources

Extension, Research and Teaching

University of Nebraska–Lincoln

IMPACT

2006

About IANR Successes

From laboratories to the classroom and from extension programs to field studies, the projects, programs and people in the Institute of Agriculture and Natural Resources at the University of Nebraska–Lincoln serve all Nebraskans.

This booklet features some of the many research, extension and teaching efforts under way in IANR to help Nebraskans meet the challenges of a changing world. This is not a comprehensive listing of IANR accomplishments, but highlights some ongoing efforts.

Writers in Communications and Information Technology prepared these impacts in cooperation with IANR faculty and administration. These deliberately brief impacts focus on the public benefits and payoffs of IANR projects. Each statement features a single-paragraph summary at the end that highlights the project's benefits. This information is used extensively in IANR communications and marketing efforts.

You are welcome to use any or all of this information to promote IANR programs.

The University of Nebraska–Lincoln does not discriminate based on gender, age, disability, race, color, religion, marital status, veteran's status, national or ethnic origin or sexual orientation.

Index

Enhance Economic Opportunities for Agricultural Producers
Aphid Controls Research 1
Beef Muscle Research Payoffs 2
Biofuels Research and Information 3
Crop Management Education 5
Dicamba-Tolerant Broadleaf Crops 6
Distillers Grain Range Cubes Cut Costs 7
Feedlot Heat Stress Research 8
Market Journal 9
Mobile Plant Diagnostic Lab Ready to Detect Plant Diseases 10
Organic Farming Project 11
Sandhills Calving System 12
Silvopasture Options 13
Water Optimizer 14
Wet Byproduct Feeds Payoffs 15
Wheat Breeding Benefits 16
*Sunflower Production Boosts Producer Income 17

Support Increased Economic Opportunities and Improved Quality of Life in Rural America
Access e-Government 19
Biofuels Research and Information 20
Court-Appointed Guardian Training 22
Helping Children Resolve Conflicts 23
Lake McConaughy Economic Study 24
Methamphetamine Community Awareness Program 25
Nebraska Youth Beef Leadership Symposium 26
Red Carpet Service Training 27
Rural Immigrants 28
Wet Byproduct Feeds Payoffs 29
*Consumer Preference and Economic Leakage Program 30
*EDGE Program Aids Entrepreneurs 31

Enhance Protection and Safety of the Nation's Agriculture and Food Supply
Hazard Analysis and Critical Control Point 32
Mobile Plant Diagnostic Lab Ready to Detect Plant Diseases 33
Research Aids Labeling Decisions 34
Soybean Rust 35
Terrorism's Impact on U.S. Grain System 36

Improve the Nation's Nutrition and Health
Food Allergen Tests 37
Growing H.O.P.E. 38
Hazard Analysis and Critical Control Point 39
Medicare Prescription Card Awareness Program 40
Methamphetamine Community Awareness Program 41
Operation Military Kids 42

** Denotes an update of an impact statement used in 2005.*

Protect and Enhance the Nation's Natural Resource Base and Environment

Groundwater Level Monitoring 43
On-site Wastewater Treatment and Management 44
Water Optimizer 46
*Drought Mitigation Research 47
*Republican River Basin Irrigation Management Project 49

Society-Ready Graduates

Ag Economics Protege Program 50
Big Red Summer Academic Camps 51
Hands-on Research Experience 52
Helping Children Resolve Conflicts 53
Morrill Scholars 54
Nebraska Youth Beef Leadership Symposium 55
Teaching Beef Herd 56
*Professional Golf Management Major 57
*Student Development Initiative Promotes Leadership 58

** Denotes an update of an impact statement used in 2005.*

Enhance Economic Opportunities for Agricultural Producers
Topic: Aphid Controls Research

Issue:
Aphids are the world's most damaging crop pest but exactly how they harm plants long has remained a puzzle. University of Nebraska–Lincoln entomologists are piecing together answers that could lead to better control.

What has been done:
Scientists long thought aphids produced a toxin that damaged plant chloroplasts, where photosynthesis happens. But no toxin has been found. UNL entomologists are exploring how aphids damage plants at the molecular level. They discovered that aphids block energy from leaving the plant's chloroplasts. It is a buildup of molecules excited by this energy – not a toxin – that eventually chews up the cells and causes visible damage. They're now exploring genes they think have key roles in protecting resistant plants from aphid damage. If they pinpoint these protective genes and show they are more active in resistant plants during aphid infestations, the genes could be used to develop crops that survive aphid damage.

Impact:
This basic research is a key first step toward controlling this costly pest using fewer chemicals. This discovery seems to hold true for most types of aphids so scientists may be able to find a single solution to reduce losses across a variety of crops and aphid species. Creating plants that withstand aphids is better than killing the insects, which can develop resistance to chemical controls.

Funding:
UNL Agricultural Research Division
USDA North Central regional research funds
Hatch Act

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Summary:
Discoveries by UNL entomologists someday could lead to better controls for aphids, the world's most damaging crop pest. Just exactly how aphids harm plants has been a much-studied mystery. IANR entomologists now think they've found key clues. They discovered that aphids block energy from leaving the plant's chloroplasts. A buildup of molecules excited by this energy eventually chews up plant cells and causes visible damage. Now they're exploring genes they believe help protect resistant plants from aphid damage. If they pinpoint these protective genes and show they're more active in resistant plants during aphid infestations, the genes could be used to develop crops that survive aphid damage. Since this seems to hold true for most types of aphids, scientists eventually may be able to find a single solution to reduce losses across a variety of crops and aphid species.

Enhance Economic Opportunities for Agricultural Producers
Topic: Beef Muscle Research Payoffs

Issue:
Not all beef cuts are created equal. Traditionally, some bring top dollar while the chuck and round are relegated to lower value products like roasts and ground beef. University of Nebraska–Lincoln meat science research is helping change that tradition and it's paying off for consumers and the beef industry.

What has been done:
UNL meat scientists teamed with University of Florida colleagues on comprehensive research to analyze 5,500 muscle samples from the beef chuck and round. They identified promising higher value uses for numerous under-used muscles. Researchers developed extensive information to help the meat industry and chefs use these muscles in new ways. This research has changed industry thinking about how to cut and use beef muscles. Their findings were the scientific basis for efforts by the National Cattlemen's Beef Association and the meat industry to develop new beef products such as the now well-known flat iron steak. These innovations increased the value of these cuts and gave consumers new, value-priced beef products. The worldwide impact of this research was demonstrated when the research team was awarded the International Meat Secretariat's Prize for Meat Science and Technology in 2004.

Impact:
These new products have increased demand for beef and added $50 to $70 in value per head over the past seven years. With more than 26 million cattle fed and marketed in the U.S. each year, that represents $1.3 billion to $1.8 billion in added value annually. More than 20,000 restaurants nationwide now sell the new cuts.

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

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Summary:
Payoffs from UNL muscle profiling research continue to add up for the nation's beef industry. IANR meat scientists teamed with University of Florida colleagues on extensive studies that identified promising higher value uses for under-used muscles in the chuck and round. The National Cattlemen's Beef Association and industry developed several new beef products, including the well-known flat iron steak, based on this research. These new products have increased demand for beef and added $50 to $70 in value per head over the past seven years. With more than 26 million cattle fed and marketed in the U.S. each year, that represents $1.3 billion to $1.8 billion in added value annually. More than 20,000 restaurants nationwide now sell the new cuts.

Enhance Economic Opportunities for Agricultural Producers
Topic: Biofuels Research and Information

Issue:
Producing ethanol and biodiesel from Nebraska's corn and soybeans provides renewable fuel that reduces demand for foreign oil and expands markets for the state's corn and soybeans. Nebraska needs research-based information to capitalize on the growing bioenergy industry.

What has been done:
University of Nebraska–Lincoln agricultural researchers are exploring a wide range of biofuels-related research to help expand Nebraska's role in this growing industry. For example, Institute of Agriculture and Natural Resources researchers analyzed diverse aspects of Nebraska's ethanol production – from feedlot and corn price economics to the impact of ethanol expansion on the state's agriculture and Nebraska's comparative advantage in ethanol production. They reported their findings at legislative briefings. The university's Industrial Agricultural Products Center worked with the Nebraska Soybean Association to study the feasibility of producing biodiesel in Nebraska. An earlier study by the center identified the best soy biodiesel and ethanol blends for combining with petroleum diesel to create E-B-diesel when using both renewable fuels. A UNL agronomist spearheaded a workshop in 2005 that shared ideas for developing the state's biofuels industry. This workshop drew about 200 people and information from discussions is being used to establish plans for enhancing the state's bioenergy industry.

Impact:
University of Nebraska–Lincoln agricultural research and extension efforts are providing scientific, technical and economic information to help turn Nebraska's crops into biofuels, which expands markets for crops and creates jobs. Nebraska businesses, agricultural producers and decision-makers are tapping IANR findings and expertise to make biofuels-related crop management, economic development, investment and public policy decisions.

Funding:
UNL Agricultural Research Division
Nebraska Soybean Association
USDA Rural Development
Nebraska Corn Board
Nebraska Ethanol Board
Nebraska Energy Office
Hatch Act

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Summary:
Producing biofuels from Nebraska's crops provides renewable fuel that reduces demand for foreign oil and expands markets for the state's corn and soybeans. UNL agricultural research and extension efforts are providing scientific, technical and economic information to help Nebraskans capitalize on the growing bioenergy industry, which should create new markets for crops and jobs for Nebraskans. For example, IANR researchers analyzed diverse aspects of Nebraska's ethanol production – from feedlot and corn price economics to the impact of ethanol expansion on the state's agriculture and Nebraska's comparative advantage in ethanol production. They reported their findings at legislative briefings. The Industrial Agricultural Products Center worked with the Nebraska Soybean Association to study the feasibility of producing biodiesel in Nebraska. An earlier center study identified the best soy biodiesel and ethanol blends for combining with petroleum diesel to create E-B-diesel when using both renewable fuels. A UNL agronomist spearheaded a workshop in 2005 that drew about 200 people to share ideas for developing the state's biofuels industry.

Enhance Economic Opportunities for Agricultural Producers
Topic: Crop Management Education

Issue:
Today's crop production requires far more than luck and good weather. To remain competitive and profitable, agricultural producers and the consultants they rely on need the latest research-based information.

What has been done:
University of Nebraska–Lincoln Extension offers a variety of educational clinics, workshops and field days across Nebraska each year that provide critical crop production information. Two examples are the Crop Management and Diagnostic Clinics and Soybean Management Field Days. The clinics included seven programs, mostly offered at the university's Research and Development Center near Mead, on topics such as field scouting, disease prevention and treatment, fertilizer and irrigation management, weed identification and more. In 2005, the clinics drew nearly 400 participants from 60 Nebraska counties and seven other states who influence or manage nearly 5.4 million acres. For Soybean Days, extension teams with the Nebraska Soybean Board, the event's sponsor. The event, held at four sites in the state, helps growers increase their market share in the face of growing demand for their crop. Sessions highlighted research, marketing, promotion, new uses and education. In 2005, these events drew 433 participants who are responsible for about 565,000 crop acres.

Impact:
The Crop Management and Diagnostic Clinics reached those responsible for nearly 40 percent of Nebraska's row crop acres. Participants estimated the knowledge they gained from the clinic was worth an average of $5.74 per acre or a total of $30.9 million, based on the acreage involved. Participants estimated the value of knowledge gained at Soybean Management Field Days at an average of $7.21 per acre, or a total of nearly $4.1 million, based on the acres involved. One participant said knowledge gained at Soybean Days helps him improve his farming and management strategies.

Funding:
UNL Extension
Nebraska Soybean Board
User fees
Smith-Lever 3(b) & (c)
Smith-Lever 3(d)

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Summary:
UNL Extension offers a variety of educational clinics, workshops and field days across Nebraska that provide critical crop production information. Two examples are the Crop Management and Diagnostic Clinics and Soybean Management Field Days. Clinics included seven programs covering topics ranging from field scouting to fertilizer and irrigation management. In 2005 the clinics drew nearly 400 participants from 60 Nebraska counties and seven other states who influence or manage nearly 5.4 million acres. Nebraska participants were responsible for nearly 40 percent of Nebraska's row crop acres. Participants valued the knowledge gained at the clinics at an average of $5.74 per acre or a total of nearly $31 million, based on acreage involved. For Soybean Days, extension teams with the Nebraska Soybean Board, the event's sponsor. The event, held at four sites, highlights research, marketing, promotion, new uses and education. In 2005, these events drew 433 participants who are responsible for about 565,000 cropland acres. Participants valued knowledge gained at an average $7.21 per acre, or a total of nearly $4.1 million, based on the acres involved.

Enhance Economic Opportunities for Agricultural Producers
Topic: Dicamba-Tolerant Broadleaf Crops

Issue:
Farmers need inexpensive tools to control broadleaf weeds in their crops. Corn and wheat growers often tackle broadleaf weeds with dicamba, an effective, inexpensive herbicide. But dicamba, sold under trade names such as Banvel and Clarity, is off-limits for broadleaf crops such as soybeans, vegetables and canola because it would damage them.

What has been done:
Discoveries by University of Nebraska–Lincoln scientists are likely to change that. A UNL biochemist identified a gene that can make dicamba-sensitive crops tolerant to the widely used herbicide. Preliminary field trials showed soybeans containing this gene can withstand spraying with dicamba at five times the typical field use rates with no injury, but much research and testing remain before a product is on the market. The university has several patents pending on this discovery. UNL and Monsanto Co. signed an exclusive licensing agreement to develop dicamba-tolerant crops. Under the agreement, UNL researchers could receive up to $2.5 million over five years for further dicamba-tolerance research to move this technology from the lab to the field.

Impact:
Dicamba-based herbicides are relatively inexpensive and easy on the environment because the chemical disappears quickly in plants and soil. Commercializing dicamba-resistant broadleaf crops will give farmers more flexibility in managing weeds in these major crops.

Funding:
UNL Agricultural Research Division
Hatch Act
Consortium for Plant Biotechnology Research
Monsanto Co.

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Summary:
Dicamba herbicide has long helped control broadleaf weeds in corn, wheat and other grassy-type crops but it's been off-limits for broadleaf crops such as soybeans, cotton and vegetables because it would harm them. Discoveries by UNL biochemists are likely to change that. A biochemist identified a gene that can make dicamba-sensitive crops tolerant to the widely used herbicide. Preliminary field trials showed soybeans containing this gene can withstand spraying with dicamba at five times the typical field use rates with no injury, but much research and testing remain before a product is on the market. The university is patenting this discovery. UNL and Monsanto Co. signed an exclusive licensing agreement to develop dicamba-tolerant crops. Dicamba-based herbicides are relatively inexpensive and easy on the environment because the chemical disappears quickly in plants and soil. Commercializing dicamba-resistant broadleaf crops will give farmers more flexibility in managing weeds in these major crops.

Enhance Economic Opportunities for Agricultural Producers
Topic: Distillers Grain Range Cubes Cut Costs

Issue:
Feed costs account for 60 percent of cow-calf herd expenses in Nebraska. Reducing those costs can be key to profitability.

What has been done:
University of Nebraska–Lincoln Extension educators in north central Nebraska and the Farmers and Ranchers Co-op at Ainsworth teamed to develop a range cube made of 60 percent distillers grain meal. Since distillers grains are by-products of regional ethanol plants, these new cubes cost less than conventional protein and energy feed sources for area beef producers. This is part of extension's ongoing effort to help identify new, lower-cost cattle feeds and educate producers about them.

Impact:
This new cube has significantly reduced feed costs and will continue to provide a lower-cost feed source. Changing from conventional range cubes to the new distillers grain cubes reduces feed costs by $31 per ton. From October 2004 through the end of January 2006, north central Nebraska cattle producers purchased more than 30,000 tons of this new supplement for a total savings of at least $930,000.

Funding:
UNL Extension
Farmers and Ranchers Co-op, Ainsworth

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Summary:
Feed costs account for 60 percent of beef herd expenses in Nebraska so anything that reduces that expense helps the bottom line. UNL Extension educators in north central Nebraska and the Farmers and Ranchers Co-op at Ainsworth teamed to develop a range cube made of 60 percent distillers grain meal. Since distillers grains are byproducts of regional ethanol plants, they provide a lower-cost protein and energy source. The new cubes save cattle producers $31 per ton. From October 2004 through January 2006, north central Nebraska ranchers and farmers purchased more than 30,000 tons of this new supplement for a total savings of at least $930,000.

Enhance Economic Opportunities for Agricultural Producers
Topic: Feedlot Heat Stress Research

Issue:
Still, sweltering, sticky summer days can be deadly for feedlot cattle. Reducing cattle deaths and performance losses from severe heat and humidity is important to feedlot profitability.

What has been done:
Research over the past decade by University of Nebraska–Lincoln animal scientists at the Northeast Research and Extension Center greatly expanded understanding of the nature of heat waves and their effects on cattle. Based on these findings, researchers developed management tools feedlot operators can use to reduce heat stress in cattle. An extensive UNL Extension education effort helped producers implement these preventive measures. Feedlot cattle deaths steadily declined during the most severe heat waves of 1995, 1999 and 2005 in northeast Nebraska and northwest Iowa – the period during which these management techniques were introduced.

Impact:
Implementation of UNL's heat stress reduction strategies is saving the region's cattle industry millions annually in cattle deaths and performance losses. In the 2005 heat wave alone, widespread adoption of these strategies saved the region's cattle industry between $10 million and $27 million. That estimate is based on the heat waves' severity and the number of cattle on feed at the time.

Funding:
UNL Agricultural Research Division
UNL Extension
USDA National Research Initiative
Hatch Act
Smith-Lever 3(b) & (c)

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Summary:
Widespread adoption of IANR-developed strategies for reducing heat stress in feedlot cattle is saving the region's cattle industry millions annually in cattle deaths and performance losses. In the past decade, research by UNL animal scientists at the university's Northeast Research and Extension Center greatly expanded understanding of the nature of heat waves and their impact on cattle. Researchers developed management tools to reduce heat stress in cattle; an extensive UNL Extension education effort helped producers adopt these preventive measures. An economic analysis showed a steady decline in cattle deaths during three severe heat waves since 1995. In the 2005 heat wave alone, it's estimated that widespread use of these tools saved the region's cattle industry between $10 million and $27 million in death and performance losses.

Enhance Economic Opportunities for Agricultural Producers
Topic: Market Journal

Issue:
Tight operating margins mean Nebraska crop and livestock producers must find ways to increase profits through their production and marketing decisions.

What has been done:
University of Nebraska–Lincoln Extension's Market Journal, an educational outreach television and Web program, provides timely, practical information geared to Nebraska agriculture. The focus is on agricultural business risk management. Topics include decisions related to crop and livestock production, commodity market analysis and strategies, financial and transition business planning, agricultural policy developments and weather. The program features experts from the university's Institute of Agriculture and Natural Resources and topic experts from the private sector. The 30-minute program began on the Web in 2001. It now airs weekly on Nebraska Educational Telecommunications, the Dish Network and is available at http://marketjournal.unl.edu. Market Journal reaches an estimated 12,000 Nebraska households weekly out of a total audience of about 20,000 households.

Impact:
Market Journal is estimated to have an annual value to agriculture of $26 million, based on a conservative estimate of reaching 20,000 households with each gaining $25 worth of value weekly. During a recent severe drought in western Nebraska, extension experts looked to Market Journal to inform cattle producers on grazing, feeding and weaning tips, which one specialist said helped save some Panhandle herds. The program is an effective way to reach large numbers of people quickly and efficiently with the latest information.

Funding:
UNL Extension
Nebraska Farmer magazine
Smith-Lever 3(b) & (c)

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Summary:
Tight operating margins mean Nebraska crop and livestock producers must find ways to increase profits through their production and marketing decisions. UNL Extension's Market Journal, an educational outreach television and Web program, provides timely, practical information specifically geared to Nebraska agricultural business risk management decisions. The program features the latest information on a variety of crop and livestock production, management and marketing issues. It airs weekly on Nebraska Educational Telecommunications, Dish Network and is also available at http://marketjournal.unl.edu. It reaches an estimated 12,000 Nebraska households weekly out of its 20,000 household audience. Market Journal's value to agriculture is estimated at $26 million annually, based on those 20,000 households nationwide each gaining $25 in value per program. During a recent severe drought in western Nebraska, extension experts looked to Market Journal to inform cattle producers on grazing, feeding and weaning tips, which one specialist said helped save some Panhandle herds.

Enhance Economic Opportunities for Agricultural Producers
Topic: Mobile Plant Diagnostic Lab Ready to Detect Plant Diseases

Issue:
Whether they occur naturally, accidently or intentionally, rapidly identifying plant diseases is critical to controlling their spread and mitigating their impact. In this era of agrosecurity concerns, rapidly diagnosing a potential problem on the spot is important.

What has been done:
In 2005, University of Nebraska–Lincoln Extension launched its new Mobile Plant Diagnostic Lab, the nation's most advanced traveling plant diagnostic lab. Funded through the Department of Homeland Security and UNL Extension, the lab is available to respond to any potential agrosecurity threat and to help farmers diagnose plant diseases on the spot. For example, if soybean rust were to enter Nebraska, the mobile lab would allow UNL plant pathologists to test suspect plants on site and provide results within two hours. The lab is equipped with the latest technology and equipment, including molecular diagnostic tools and satellite communications, for immediate notification of state and federal agencies. The lab also is being used at field days statewide for farmers to bring in plant samples and to increase awareness of plant diseases.

Impact:
Thanks to this lab, Nebraska is better prepared to quickly detect plant disease and respond to potential agrosecurity threats on site. The lab also can provide results in hours instead of the several days typically needed to mail samples to the university's on-campus lab. The speedy response could be especially critical in a case of agroterrorism or a severe disease outbreak.

Funding:
U.S. Department of Homeland Security/Nebraska Department of Agriculture
UNL Extension

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Summary:
Nebraska is better prepared to detect plant disease problems on the spot thanks to UNL Extension's new Mobile Plant Diagnostic Lab. The lab, which began operating in 2005, is the most advanced of its kind in the nation. Funded by the U.S. Department of Homeland Security and UNL Extension, the lab can be pulled anywhere it's needed to respond to potential agrosecurity threats or to help farmers diagnose diseases threats, whether they occur naturally, intentionally or accidently. Equipped with the latest technology, the lab is able to provide results within two hours and to immediately notify state or federal regulators if necessary. Before the mobile lab, it often took several days for samples to be mailed to and analyzed at the university's on-campus diagnostic lab. The mobile lab will travel to field days statewide and provide plant sample test results before growers leave the site.

Enhance Economic Opportunities for Agricultural Producers
Topic: Organic Farming Project

Issue:
Organic farming is one of the fastest growing segments of U.S. agriculture. In Nebraska, certified organic crop and pasture acreage nearly doubled from 1997 to 2003, according to the U.S. Department of Agriculture. To capitalize on this expanding market, the state's farmers need practical, science-based information about growing food organically under Nebraska conditions.

What has been done:
The University of Nebraska–Lincoln in 2005 initiated a project to expand organic farming research and education, enhance collaborations with growers and develop science-based information for organic food production. As part of a $750,000 grant, Institute of Agriculture and Natural Resources researchers will establish the university's first certified organic research plots at four research farms around the state in which scientists can study locally important organic production issues. Scientists will work closely with organic farmers. Advisory committees of organic producers are helping to guide research and scientists will conduct studies on cooperating certified organic farms. Education is a key part of this project. A UNL Extension educator will coordinate the project and plan how best to share findings and organic concepts with farmers and students. The overall aim is to incorporate organic farming concepts into IANR's extension, research and teaching.

Impact:
This research and education effort is laying the foundation to help the university meet the increasing need for practical, science-based information about organic farming in Nebraska. Establishing certified organic test plots will take three years but will make possible long-term research on organic systems and allow researchers to provide localized information for producers.

Funding:
USDA Cooperative State Research, Education and Extension Service
UNL Agricultural Research Division
UNL Extension
Hatch Act
National Research Initiative

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Summary:
Organic farming is one of the fastest growing segments of U.S. agriculture. A new IANR research and extension project is laying the foundation to expand organic farming research and education, enhance collaborations with growers and develop science-based information for organic food production in Nebraska. As part of a $750,000 USDA-CSREES grant, the team is establishing the university's first certified organic research plots at four research farms around the state where scientists will study locally important organic farming issues. They'll also work closely with the state's organic growers, including conducting studies on certified organic farms. Education is a key part of this project. This research and education effort is laying the foundation that will enable the university to meet the increasing need for practical, science-based research and education about organic farming in Nebraska.

Enhance Economic Opportunities for Agricultural Producers
Topic: Sandhills Calving System

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

What has been done:
University of Nebraska–Lincoln veterinary scientists developed a calving system to reduce calf scours on ranches in Nebraska's Sandhills. The system manages cow herds during calving season to prevent transmission of diarrhea-causing germs and break the disease cycle by moving pregnant cows to a new pasture every week and leaving cows with new calves in the previous pasture. The system drastically reduced calf illness and treatment costs and eliminated calf deaths from scours in initial tests. It has proven effective in numerous Nebraska cow-calf herds since it was introduced in 2000. For example, in a 900-head herd near Tryon, scours death rates dropped from 7 to 14 percent in the five years before adopting the Sandhills system to zero after adoption. The team has taught veterinarians and ranchers how to implement this strategy through UNL Extension education programs.

Impact:
Ranchers who have adopted this system report significantly reducing calf sickness, death and antibiotic use. The owner of a 900-head cow herd estimates he earns an additional $40,000 to $50,000 annually since adopting the calving system because of improved calf performance, greatly reduced treatment costs and having more calves to sell. Treatment costs dropped from about $3,100 per year to about $129. The owner of a 400-head cow-calf operation said the system virtually eliminated scours problems and estimates it results in about $10,000 in additional annual revenue.

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

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Summary:
The IANR-developed Sandhills Calving System is helping ranchers who use it virtually eliminate costly scours, a leading cause of death and sickness in beef calves. Veterinary scientists designed and successfully tested the new system, which greatly reduces scours outbreaks by managing cow-calf pairs and pregnant cows to minimize calf contact with diarrhea-causing germs. Since few calves get sick, this system also significantly reduces the need for antibiotics and saves labor. The owner of a 900-head herd reports the incidence of scours deaths dropped from 7 to 14 percent in the five years before implementing the system to zero after adoption. He estimates earning as much as $50,000 more annually since making the switch in 2000 due to improved calf performance, reduced treatment costs and having more calves to sell. The owner of a 500-head herd estimates the system provides about $10,000 in added revenue each year. The team continues to teach ranchers and veterinarians how to adopt the system.

Enhance Economic Opportunities for Agricultural Producers
Topic: Silvopasture Options

Issue:
Grazing livestock amid trees that have market value, called silvopasturing, can diversify and improve economic potential. To successfully integrate trees and grazing, ag producers need to know which combination of trees and grasses work best under local conditions.

What has been done:
University of Nebraska–Lincoln range and plant scientists are studying different combinations of forage grasses and trees in test plots to identify the best-performing combinations under different climate, soil and moisture conditions. This study compares yields and forage quality of big bluestem and smooth bromegrass in low, medium and high shade from mature green ash and scotch pine trees. Bluestem outyields bromegrass in full sun but yields are comparable in shade. Bluestem's higher water and nitrogen efficiency make it the better choice for drier situations. Findings show the best combination of forage grasses and trees varies according to local conditions and should be chosen based on specific management goals. The greatest challenge is finding shade trees that will grow in often harsh climates and that also have market value.

Impact:
This research is providing some of the first specific information about the best grass and tree combinations for Nebraska climate and soil conditions. Results should help producers make more informed management choices to combine trees and grazing to maximize profits.

Funding:
UNL Agricultural Research Division
USDA National Agroforestry Center
Hatch Act
McIntire-Stennis Cooperative Forestry

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Summary:
IANR scientists are studying how different grasses perform under varying levels of shade from different trees to identify the best combinations of grasses for grazing and trees with market value. Combining trees and livestock grazing, called silvopasturing, can diversify and improve economic potential. However, producers need to know which combination of trees and grasses work best in their situation. Results show the best combinations of forage grasses and trees vary according to local conditions and should be chosen based on specific management goals of the producer. This research is providing some of the first information on which grass and tree combinations work best in Nebraska. Results should help producers make more informed management choices to combine trees and grazing to maximize profits.

Enhance Economic Opportunities for Agricultural Producers
Topic: Water Optimizer

Issue:
Nebraska irrigators facing water shortages must make difficult and complex choices about how best to use limited water.

What has been done:
An agricultural economist and a biological systems engineer at the University of Nebraska–Lincoln developed the Water Optimizer. This decision-support computer program became available in 2005 to help farmers make better-informed cropping choices such as determining whether it would be most profitable to grow different crops, irrigate fewer acres, apply less water to existing crops or go to dryland farming. Growers load information about their operation such as the amount of water available, soil type, irrigation system type and fuel type for irrigation. They also enter production costs, irrigation costs, crop prices and crop type. The Water Optimizer is available on the Web at http://extension-water.unl.edu/ or on a DVD/CD set and was promoted at dozens of UNL Extension meetings in 2005.

Impact:
This Institute of Agriculture and Natural Resources-developed tool is helping Nebraska farmers make more informed choices that conserve water and producer profits. Nearly 700 users downloaded or purchased the tool in 2005.

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

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Summary:
Nebraska irrigators facing water shortages have a new tool to help them make difficult and complex choices about how best to use their limited water supplies. The Water Optimizer, a decision-support computer program developed by IANR researchers, became available in 2005 to help farmers make more informed choices that conserve water and producer profits. Nearly 700 producers downloaded or purchased the tool in 2005. It lets users enter individualized information and calculate which crops will be most profitable with the given costs and available water. By running "what if" scenarios, growers can see the best options for farming with limited water whether it be growing different crops, irrigating fewer acres, applying less water to existing crops or going to dryland farming.

Enhance Economic Opportunities for Agricultural Producers
Topic: Wet Byproduct Feeds Payoffs

Issue:
Nebraska is the nation's third largest ethanol producer and the largest ethanol producing state west of the Mississippi. Turning grain into fuel is big business for the Cornhusker state and making the best use of byproducts from this production is critical to the industry's success.

What has been done:
University of Nebraska–Lincoln animal scientists pioneered research on how to feed cattle wet byproducts from ethanol and corn processing. Their research in the 1990s proved the feasibility, benefits and economic advantages of feeding wet gluten feed, wet distillers grains and steep liquor to cattle directly instead of drying and shipping them to dried feed markets. They found that drying actually reduces byproducts' nutritional value. Feeding byproducts wet saves drying costs for processors and provides an economical feed for cattle producers. Nebraska scientists, who are leaders in byproduct feeds research, continue studies that have helped the cattle industry make the best use of these byproducts. Their findings also were instrumental in encouraging some ethanol plants to locate in Nebraska.

Impact:
Thanks largely to this research, wet byproducts from ethanol and corn processing have become a major source of cattle feed in Nebraska, a leading cattle feeding state. Use of wet feeds provides major and ongoing economic benefits. It's estimated that from 1992 through 2004, the cumulative benefit to Nebraska from feeding byproducts wet instead of dry was $400 million. Feeding wet byproducts saves cattle feeders $10 to $20 per head; selling byproducts wet instead of drying them reduces ethanol production costs about 5 percent.

Funding:
Nebraska Corn Board
Nebraska Ethanol Board
UNL Agricultural Research Division
Hatch Act

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Summary:
Economical wet byproducts from Nebraska's expanding ethanol and grain processing industry have become a major cattle feed, thanks largely to pioneering IANR research that is paying handsome dividends for Nebraska. UNL animal scientists proved the feasibility, benefits and economic advantages of feeding byproducts wet instead of drying and shipping them to dried feed markets. Feeding byproducts wet saves drying costs for processors and provides an economical cattle feed. These findings were instrumental in encouraging some ethanol plants to locate in Nebraska. Continuing research has showed cattle feeders how best to use these economical feeds. It's estimated that from 1992 through 2004, the cumulative benefit to Nebraska from feeding byproducts wet instead of dry was $400 million. Feeding wet byproducts saves cattle feeders $10 to $20 per head; selling byproducts wet instead of drying them reduces ethanol production costs about 5 percent.

Enhance Economic Opportunities for Agricultural Producers
Topic: Wheat Breeding Benefits

Issue:
To be competitive, growers need wheat varieties that perform well in Nebraska's unique, sometimes extreme, growing conditions.

What has been done:
University of Nebraska–Lincoln wheat breeders have long teamed with USDA-Agricultural Research Service scientists based at UNL on research and breeding to develop varieties that are widely grown in Nebraska and beyond. UNL's highly regarded wheat breeding program focuses on both agronomic and end-use characteristics. UNL researchers are collaborating with scientists in 17 states on research to implement new molecular technologies, called Marker Assisted Selection, that will improve U.S. wheat quality and disease resistance. Researchers are working to identify genetic markers and associated genes for complex genetic traits, such as yield, that growers and industry have identified as top priorities.

Impact:
Nebraska-developed hard red winter wheat varieties are planted on about 62 percent of the state's wheat acres. These improved varieties have helped boost Nebraska's annual yields by 9.5 million bushels since the 1960s. These improved varieties are worth roughly $30 to $35 million annually to Nebraska producers, based on increased yield alone. Consumers benefit, too. Yield improvement in these varieties means Nebraska wheat growers can feed nearly 3.8 million more people a year than they did on the same acreage in the 1960s. Current research to develop new genetic technologies will make future UNL wheat breeding faster and more precise.

Funding:
USDA-Agricultural Research Service
Nebraska Wheat Board
Hatch Act
UNL Agricultural Research Division

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Summary:
Varieties developed through the University of Nebraska–Lincoln's wheat breeding program provide Nebraska growers with improved wheats that perform well in the field and offer the quality characteristics millers and bakers demand. Nebraska-developed hard red winter wheat varieties are planted on about 62 percent of the state's wheat acres. These improved varieties have helped boost Nebraska's annual yields by 9.5 million bushels since the 1960s. These improved varieties are worth roughly $30 to $35 million annually to Nebraska producers, based on increased yield alone. Yield improvement in these varieties means Nebraska wheat growers can feed nearly 3.8 million more people a year than they did on the same acreage in the 1960s. Nebraska wheat breeders now are collaborating with scientists in 17 states on research to implement new molecular technologies, called Marker Assisted Selection, that will improve U.S. wheat quality and disease resistance.

Enhance Economic Opportunities for Agricultural Producers
Topic: Sunflower Production Boosts Producer Income

Issue:
Sunflowers can help Panhandle farmers diversify, control pests and disease, spread production risks and make the most of limited water. Strong prices boosted interest in sunflower production in 2005 and increased the need for timely science-based information.

What has been done:
University of Nebraska–Lincoln Extension responded quickly to this increased demand for information from first-time and established growers by offering educational programs based on ongoing research at the Panhandle Research and Extension Center. High demand for confection sunflower and sunflower oil had pushed up prices and continued drought left producers seeking crops that need less irrigation water than corn. Extension provided information on producing sunflowers, individual site visits and discussions with new growers as part of a first-time grower mentoring program. Extension also offered sunflower tours and incorporated sunflower information into annual crop production meetings. Extension was able to respond quickly, thanks to ongoing sunflower studies by UNL researchers in the Panhandle. Over the years, this research has provided information on how best to produce sunflowers in the region and helped increase sunflower acreage.

Impact:
These timely educational efforts helped the region's growers capitalize on strong sunflower prices. Panhandle sunflower production jumped nearly 170 percent in 2005 from 2004 to 89,000 acres. Much of the crop was grown on limited irrigation acres, thanks in part to extension information. The region's gross income from sunflowers in 2005 was about $17 million, about triple the 2000-2004 average.

Funding:
UNL Extension
UNL Agricultural Research Division
USDA-Sustainable Agriculture Research and Education
Hatch Act
Smith-Lever 3(b) & (c)

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Summary:

Strong prices and continued drought in 2005 boosted Panhandle farmers' interest in growing sunflowers. UNL Extension met the increased demand for science-based production information through educational programs for established and first-time growers. Extension provided growers information on producing sunflowers, including tours, meetings and a first-time grower mentoring program. Extension was able to respond quickly, thanks to ongoing sunflower studies by UNL researchers in the Panhandle. These timely educational efforts helped the region's growers capitalize on strong sunflower prices. Panhandle sunflower production jumped nearly 170 percent in 2005 from 2004 to 89,000 acres. Much of the crop was grown on limited irrigation acres, thanks in part to extension information. The region's gross income from sunflowers in 2005 was about $17 million, about triple the 2000-2004 average.

Support Increased Economic Opportunites and Improved Quality of Life in Rural America
Topic: Access e-Government

Issue:
Internet and computer technology can help rural government officials more efficiently serve citizens, save money, ease workloads and even help promote local economic development. To make the most of these tools, however, county officials need to understand how to use them.

What has been done:
The concept of e-government began in 2003 with University of Nebraska–Lincoln Extension cooperating with University of Minnesota Extension on the Access e-Government curriculum. However, assessments in pilot counties showed that some Nebraska communities first needed basic training. UNL Extension's Access e-Government program teaches county officials and personnel computer basics, including electronic file management, Web sites, e-mail, spreadsheets and word processing. Training has been offered mainly in smaller rural counties where computer use had been limited. Since the program began in 2004, extension has trained 413 participants in more than 25 counties. Project partners include the Nebraska Association of County Officials; Nebraska.gov, Web developers for the state and most county sites; Nebraska Secretary of State; Nebraska Information Technology Commission; UNL Center for Applied Rural Innovation, NU Rural Initiative and Technologies Across Nebraska. Classes are ongoing in 2006.

Impact:
This e-government education is helping county officials expand Internet and computer technology use to serve patrons more effectively and reduce costs and workload. In counties where training has been offered, residents and county officials are more likely to use the Web to find information and provide services. For example, after completing training, Nuckolls County posted 2004 election results on its new county Web site, reducing calls to the county clerk's office by at least 75 percent. Cuming County launched an e-government advisory committee and Seward County began exploring working on a joint Web site for the county and its communities.

Funding:
UNL Extension
Nebraska Secretary of State Grant Review Board
User fees
Smith-Lever 3(b) & (c)

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Summary:
More and more Nebraska counties are harnessing Internet and computer tools to better serve citizens, easing county office workloads and reducing costs, thanks to a UNL Extension program. Access e-Government teaches county officials and personnel how to use computers and the Web. Extension has taught 413 people in more than 25 counties since the program began in 2004. For example, after this program, Nuckolls County posted 2004 election results on its new county Web site, reducing calls to the county clerk's office by at least 75 percent. Cuming County launched an e-government advisory committee and Seward County began exploring working on a joint Web site for the county and its communities. Classes are ongoing in 2006.

Support Increased Economic Opportunities and Improved Quality of Life in Rural America
Topic: Biofuels Research and Information

Issue:
Producing ethanol and biodiesel from Nebraska's corn and soybeans provides renewable fuel that reduces demand for foreign oil and expands markets for the state's corn and soybeans. Nebraska needs research-based information to capitalize on the growing bioenergy industry.

What has been done:
University of Nebraska–Lincoln agricultural researchers are exploring a wide range of biofuels-related research to help expand Nebraska's role in this growing industry. For example, Institute of Agriculture and Natural Resources researchers analyzed diverse aspects of Nebraska's ethanol production – from feedlot and corn price economics to the impact of ethanol expansion on the state's agriculture and Nebraska's comparative advantage in ethanol production. They reported their findings at legislative briefings. The university's Industrial Agricultural Products Center worked with the Nebraska Soybean Association to study the feasibility of producing biodiesel in Nebraska. An earlier study by the center identified the best soy biodiesel and ethanol blends for combining with petroleum diesel to create E-B-diesel when using both renewable fuels. A UNL agronomist spearheaded a workshop in 2005 that shared ideas for developing the state's biofuels industry. This workshop drew about 200 people and information from discussions is being used to establish plans for enhancing the state's bioenergy industry.

Impact:
University of Nebraska–Lincoln agricultural research and extension efforts are providing scientific, technical and economic information to help turn Nebraska's crops into biofuels, which expands markets for crops and creates jobs. Nebraska businesses, agricultural producers and decision-makers are tapping IANR findings and expertise to make biofuels-related crop management, economic development, investment and public policy decisions.

Funding:
UNL Agricultural Research Division
Nebraska Soybean Association
USDA Rural Development
Nebraska Corn Board
Nebraska Ethanol Board
Nebraska Energy Office
Hatch Act

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Summary:

Producing biofuels from Nebraska's crops provides renewable fuel that reduces demand for foreign oil and expands markets for the state's corn and soybeans. UNL agricultural research and extension efforts are providing scientific, technical and economic information to help Nebraskans capitalize on the growing bioenergy industry, which should create new markets for crops and jobs for Nebraskans. For example, IANR researchers analyzed diverse aspects of Nebraska's ethanol production – from feedlot and corn price economics to the impact of ethanol expansion on the state's agriculture and Nebraska's comparative advantage in ethanol production. They reported their findings at legislative briefings. The Industrial Agricultural Products Center worked with the Nebraska Soybean Association to study the feasibility of producing biodiesel in Nebraska. An earlier center study identified the best soy biodiesel and ethanol blends for combining with petroleum diesel to create E-B-diesel when using both renewable fuels. A UNL agronomist spearheaded a workshop in 2005 that drew about 200 people to share ideas for developing the state's biofuels industry.

Support Increased Economic Opportunities and Improved Quality of Life in Rural America
Topic: Court-Appointed Guardian Training

Issue:
Guardians, court-appointed individuals who look after the affairs of vulnerable people, are in high demand in Nebraska. More than 2,000 are appointed annually. When acting in their ward's best interest, guardians face sometimes complex rules, often with little training.

What has been done:
For years, the only training available to guardians in Nebraska was limited to a 30-minute videotape. Nebraska judges and others asked University of Nebraska–Lincoln Extension to help develop guardian training materials. Extension developed a curriculum and publications, all reviewed by the Nebraska Supreme Court, Nebraska Bar Association and others. From fall 2004 through January 2006, more than 235 court-appointed guardians in 11 of the state's 12 judicial districts attended extension's three-hour training session, where volunteer attorneys answered legal questions. Training is now provided quarterly in 10 judicial districts and monthly in Lancaster County.

Impact:
Guardians serve a much-needed role in the care of the elderly, people with mental or physical disabilities, or children who can't make decisions for themselves. This enhanced training is helping guardians better prepare to serve in their ward's best interests. Guardians say the training increased their knowledge and helped them better understand their responsibilities and how to deal with certain situations. "I'm more comfortable with my responsibilities now that I've taken this course," one guardian said.

Funding:
UNL Extension
Registration fees
User fees
Nebraska State Bar Association

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Summary:
Nebraska county court judges appoint more than 2,000 people annually as legal guardians for elderly and disabled people or children who cannot make decisions for themselves. Guardians are in demand but traditionally received little training. UNL Extension partnered with the legal system at the request of Nebraska judges to develop a curriculum and materials to teach people about guardianship responsibilities. The result is a three-hour training session and resources all approved by the Nebraska Supreme Court and others. More than 235 people in 11 of the state's 12 judicial districts were trained from fall 2004 through January 2006. Guardians say they are more comfortable with their roles, more knowledgeable about their responsibilities and are better prepared to represent their wards' best interests as a result of this training.

Support Increased Economic Opportunities and Improved Quality of Life in Rural America
Topic: Helping Children Resolve Conflicts

Issue:
Children arguing is common even in a child-care setting. Adults can simply solve the problem for children, but that doesn't teach the children how to resolve their conflict, a skill they'll need throughout their lives.

What has been done:
University of Nebraska–Lincoln Extension is teaching early childhood professionals a new, more effective way to settle squabbles based on research by a UNL family scientist. During training sessions for early childhood professionals, extension teaches conflict mediation skills and how to help preschoolers learn to resolve their own conflicts. Nearly 3,000 early childhood professionals, educators and foster parents have received education at nearly 20 trainings statewide in the past two years.

Impact:
More than 94 percent of program participants report they have a high level of understanding about methods for resolving conflicts with children, thanks to this training. As a result of this training, participants reported they will listen to children better and be more patient. Participants said they learned to give each child the appropriate amount of time to tell their side, then help them understand what they can and cannot do. They are using this knowledge to help children in their care resolve conflicts more productively and improve their problem-solving skills.

Funding:
UNL Extension
User fees
Smith-Lever 3(b) & (c)

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Summary:
Childhood arguments are common even in child-care settings. Adults can simply solve the problem for children, but that doesn't teach kids to solve conflicts themselves. UNL Extension is teaching early childhood professionals a new, more effective way to settle squabbles. During conferences, participants learn conflict mediation skills and how to help preschoolers learn to resolve their own conflicts. Nearly 3,000 early childhood professionals, educators and foster parents have received education at nearly 20 conferences statewide in the past two years. Participants say the training gives them the knowledge to help children resolve conflicts more productively and improve their skills.

Support Increased Economic Opportunities and Improved Quality of Life in Rural America
Topic: Lake McConaughy Economic Study

Issue:
Several years of drought have left Lake McConaughy, Nebraska's largest reservoir, at historic lows. The persistent low levels are affecting a variety of lake constituents including recreational users and businesses that serve them.

What has been done:
In 2004-05, a University of Nebraska–Lincoln agricultural economist researched how declining lake levels have affected the region's recreation industry and whether short-term water management strategies to reduce that impact could be economically justifiable. Those strategies would make less water available to irrigators or hydro-power interests for one year by holding back more water in the reservoir. This one-year holdback potentially could increase the lake's water level for recreational use for several years to come, depending on how quickly the reservoir refills, and boost benefits to recreational uses enough to offset the costs of compensating irrigators or power interests for their losses.

Impact:
The study showed that lakeside businesses reported steady declines since the drought began in 2001 and that recreational use of McConaughy in 2004 was 32 percent below the most recent 10-year average. Half of the McConaughy visitors interviewed said they'd visit the lake more often if its levels were normal. This research will be a factor in reservoir management decisions and broad policy discussions in the state Legislature about how best to manage water use among competing interests.

Funding:
UNL Agricultural Research Division
Federal grants
Hatch Act

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Summary:
Persistent drought has left Lake McConaughy, Nebraska's largest reservoir, at historic lows, reducing recreational use of the lake and resulting in steady declines in profits for businesses that cater to lake users. An IANR agricultural economist's study determined that in some circumstances it would be economically justifiable for the state's overall economy to make less water available to irrigators or hydro-power interests for one year by holding back more water in the reservoir. This one-year holdback potentially could increase the lake's water level for recreational use for several years to come, depending on how quickly the reservoir refills, and boost income from recreational uses enough to offset the costs of compensating irrigators or power interests for their losses. This research will be a factor in broad policy discussions in the state Legislature about how best to manage water use among the many interests.

Support Increased Economic Opportunities and Improved Quality of Life in Rural America
Topic: Methamphetamine Community Awareness Program

Issue:
Methamphetamine production and use have reached epidemic levels in parts of the United States. Rural areas in Nebraska and elsewhere are especially vulnerable because supplies to make the drug can be easily found there. This epidemic threatens families and communities.

What has been done:
University of Nebraska–Lincoln Extension teamed with 3rd District Rep. Tom Osborne to promote community awareness of the drug's dangers. In 2005, over 4,000 Nebraskans learned about meth from presentations and educational handouts. Nearly 30,000 Extension publications and handouts were distributed. The "Nebraska Cleanup Volunteer Safety" DVD and brochure were distributed to every Nebraska county by UNL Extension and Keep Nebraska Beautiful. Extension also has provided information about anhydrous ammonia theft and its relationship to meth production, which has been shared at pesticide training.

Impact:
Six months after the meth program was presented in Indianola, law enforcement there reported a significant decrease in meth activity. The local sheriff attributed it to increased community awareness, including neighborhood "meth walks" and increased citizen monitoring and reporting. Also, in communities where the program has been presented, volunteer clean-up groups are more knowledgeable about meth lab litter safety, thanks to distribution of the volunteer safety DVD and brochure.

Funding:
UNL Extension
Nebraska State Patrol
Keep Nebraska Beautiful grant from Department of Environmental Quality
Midwest High-Intensity Drug Trafficking Areas program
Smith-Lever 3(b) & (c)
User fees

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Summary:
Methamphetamine production and use is epidemic in parts of the U.S. Rural areas in Nebraska and elsewhere are especially vulnerable because supplies to make the drug can be easily found there. If this epidemic goes unchecked, it can tear apart families and communities and overwhelm legal, medical and social resources. UNL Extension teamed with 3rd District Rep. Tom Osborne to promote community awareness of the drug's dangers. In 2005, over 4,000 Nebraskans learned about meth from presentations and educational handouts. Nearly 30,000 Extension publications and informational materials were distributed. The "Nebraska Cleanup Volunteer Safety" DVD and brochure were distributed to every Nebraska county by UNL Extension and Keep Nebraska Beautiful. Six months after the meth program was presented in Indianola, law enforcement there reported a significant decrease in meth activity thanks to increased community awareness, including neighborhood "meth walks" and increased citizen monitoring and reporting. Also, in communities where the program has been presented, volunteer clean-up groups are more knowledgeable about meth lab litter safety, thanks to distribution of the volunteer safety DVD and brochure.

Support Increased Economic Opportunities and Improved Quality of Life in Rural America
Topic: Nebraska Youth Beef Leadership Symposium

Issue:
To remain strong in the future, Nebraska agriculture and its beef industry need to attract talented, well-educated young people. And to become future leaders in agriculture, Nebraska students need a solid education, a good understanding of the beef business, leadership skills and an idea of the many career opportunities agriculture offers.

What has been done:
University of Nebraska–Lincoln animal science and agricultural leadership faculty teamed with the Nebraska Beef Council, Nebraska Cattlemen and producers, feeders, financial institutions and related industries to offer the Nebraska Youth Beef Leadership Symposium at UNL. Held annually since 2003, the three-day event lets students in high school and two-year colleges learn about the beef industry, career options and beef-related educational opportunities in the university's Institute of Agriculture and Natural Resources. They talk with faculty and beef industry leaders and build leadership skills. A business simulation called Beefville, in which participants take on characters and roles in a community, completes the symposium.

Impact:
The symposium strengthens students' knowledge about the beef industry, giving them a much clearer understanding of career and leadership opportunities in agriculture. Organizers say it is generating enthusiasm among students for ag-related careers. Participants say the symposium helps them better appreciate the importance of community and industry involvement. "If you want to make a difference you have to be involved," one participant said.

Funding:
UNL Department of Animal Science
UNL Department of Agricultural Leadership, Education and Communication
Nebraska Beef Council
Nebraska Cattlemen Research and Education Foundation
Nebraska Corn Board
Cargill Inc., Sweet Bran
Midwest PMS
Darr Feedlot
Wagonhammer Cattle Company
Elanco Animal Health

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Summary:
Young people are important to the future of Nebraska agriculture and the beef industry. UNL animal science and agricultural leadership faculty partner with the Nebraska Beef Council, Nebraska Cattlemen and others to offer the Nebraska Youth Beef Leadership Symposium. The annual three-day event gives junior and senior high school students and students at two-year colleges a chance to meet with leaders of the beef industry, learn more about the beef industry, and explore career opportunities in agriculture and UNL's beef-related educational offerings. The symposium is laying the groundwork for a new generation of Nebraska agricultural leaders. It is generating enthusiasm for ag-related careers and increasing students' awareness of leadership opportunities in agriculture. Participants say the symposium helps them better appreciate the importance of community and industry involvement.

Support Increased Economic Opportunities and Improved Quality of Life in Rural America
Topic: Red Carpet Service Training

Issue:
Rural communities eager to attract tourist dollars may overlook some key local resources in promoting their town – the food servers, clerks and other frontline employees visitors and tourists typically turn to for advice on local entertainment, sites and services.

What has been done:
The University of Nebraska Rural Initiative and University of Nebraska–Lincoln Extension partnered to launch the Red Carpet Service training program that helps communities better promote their area's offerings to visitors. This train-the-trainer hospitality program teaches frontline employees about customer service, how to make a positive first impression of their community and promote area tourism. A local organization sponsors the training. Extension and the Rural Initiative work closely with sponsoring community organizations to customize training to their needs. Employees who complete training then teach the program to others in the community, which multiplies the scope and benefit. In 2005, the program's first full year, 72 people completed classes in Broken Bow, Columbus, Beatrice and Jefferson and Thayer counties.

Impact:
In the long run, this program will help rural economies by preparing communities to better meet visitors' needs and build local tourism. Program graduates say they now see local offerings in a new light, better understand their key role and are excited about promoting their area. Several participating communities are exploring ways to improve their Web presence to attract visitors. Jefferson and Thayer counties and their communities are looking at promoting tourism regionally, and a Broken Bow grocery store added a marque featuring local events and maps.

Funding:
UNL Extension
NU Rural Initiative
Smith-Lever 3(b) & (c)
University of Nebraska System
NU Institute of Agriculture and Natural Resources

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Summary:
Friendly, helpful service is key to getting visitors to stay longer or return to a rural community. A University of Nebraska Rural Initiative program offered in partnership with UNL Extension is helping communities better promote their area's offerings to visitors, travelers and tourists. The Red Carpet Service hospitality program teaches retail clerks, food servers and other frontline employees who usually meet visitors how to better serve visitors and promote area offerings. In 2005, the program's first full year, 72 people completed classes in Broken Bow, Columbus, Beatrice and Jefferson and Thayer counties. Program graduates say they now see local offerings in a new light, better understand their key role and are excited about promoting their area. After participating, several communities are exploring ways to improve their Web presence to attract visitors, promote tourism regionally or make it easier for visitors to find out about local events.

Support Increased Economic Opportunities and Improved Quality of Life in Rural America
Topic: Rural Immigrants

Issue:
Going to college while working full time is hard for anyone. It's especially tough if you're a recent immigrant with a language barrier. University of Nebraska–Lincoln researchers hope to aid rural immigrants by learning what helps or hinders their efforts to complete an education.

What has been done:
College of Education and Human Sciences researchers studied bilingual Latinos – most of whom were first- or second-generation immigrants – in northeast Nebraska pursuing online classes from UNL. They found significant family or community support and access to child care are keys to success. Participants with more support from their partners and who were more integrated into their communities reported less stress and depression. This preliminary research highlighted the need for more comprehensive information on barriers to education. The team is expanding its research to explore issues of marital dynamics and psycho-social health among these rural Nebraska immigrants and their families.

Impact:
Funding and further research should lead to better services, such as mentoring relationships and informal support networks, to reduce obstacles and improve chances of success for rural immigrants and women seeking an education. Participants said their involvement in the program also made them role models for their children and helped their children recognize the value of education. One participant said, "... my little girl says sometimes, 'I want to be a teacher because you're a teacher'."

Funding:
U.S. Department of Education
UNL Agricultural Research Division
Hatch Act

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Summary:
Going to college while working full time is hard for anyone. It's especially tough for recent immigrants with language barriers. UNL researchers hope to aid rural immigrants by identifying what helps or hinders their efforts to complete an education. College of Education and Human Sciences researchers studied bilingual Latinos – most of whom were first- or second-generation immigrants – in northeast Nebraska pursuing online classes from UNL. They found significant family or community support and access to child care are keys to success. These results and further research should help provide better services, such as mentoring relationships and informal support networks, to improve chances of success for rural immigrants and women seeking an education. Participants said their involvement in the program also made them role models for their children and helped their children recognize the value of education. One participant said, "... my little girl says sometimes, 'I want to be a teacher because you're a teacher'."

Support Increased Economic Opportunities and Improved Quality of Life in Rural America
Topic: Wet Byproduct Feeds Payoffs

Issue:
Nebraska is the nation's third largest ethanol producer and the largest ethanol producing state west of the Mississippi. Turning grain into fuel is big business for the Cornhusker state and making the best use of byproducts from this production is critical to the industry's success.

What has been done:
University of Nebraska–Lincoln animal scientists pioneered research on how to feed cattle wet byproducts from ethanol and corn processing. Their research in the 1990s proved the feasibility, benefits and economic advantages of feeding wet gluten feed, wet distillers grains and steep liquor to cattle directly instead of drying and shipping them to dried feed markets. They found that drying actually reduces byproducts' nutritional value. Feeding byproducts wet saves drying costs for processors and provides an economical feed for cattle producers. Nebraska scientists, who are leaders in byproduct feeds research, continue studies that have helped the cattle industry make the best use of these byproducts. Their findings also were instrumental in encouraging some ethanol plants to locate in Nebraska.

Impact:
Thanks largely to this research, wet byproducts from ethanol and corn processing have become a major source of cattle feed in Nebraska, a leading cattle feeding state. Use of wet feeds provides major and ongoing economic benefits. It's estimated that from 1992 through 2004, the cumulative benefit to Nebraska from feeding byproducts wet instead of dry was $400 million. Feeding wet byproducts saves cattle feeders $10 to $20 per head; selling byproducts wet instead of drying them reduces ethanol production costs about 5 percent.

Funding:
Nebraska Corn Board
Nebraska Ethanol Board
UNL Agricultural Research Division
Hatch Act

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Summary:
Economical wet byproducts from Nebraska's expanding ethanol and grain processing industry have become a major cattle feed, thanks largely to pioneering IANR research that is paying handsome dividends for Nebraska. UNL animal scientists proved the feasibility, benefits and economic advantages of feeding byproducts wet instead of drying and shipping them to dried feed markets. Feeding byproducts wet saves drying costs for processors and provides an economical cattle feed. These findings were instrumental in encouraging some ethanol plants to locate in Nebraska. Continuing research has showed cattle feeders how best to use these economical feeds. It's estimated that from 1992 through 2004, the cumulative benefit to Nebraska from feeding byproducts wet instead of dry was $400 million. Feeding wet byproducts saves cattle feeders $10 to $20 per head; selling byproducts wet instead of drying them reduces ethanol production costs about 5 percent.

Support Increased Economic Opportunities and Improved Quality of Life in Rural America
Topic: Consumer Preference and Economic Leakage Program

Issue:
Better understanding what customers want is one of the best ways for small-town retailers to keep people shopping locally, attract new customers and compete with stores in larger communities.

What has been done:
A University of Nebraska–Lincoln Extension program helps small rural businesses better understand what consumers want, improve communications with customers and identify ways to improve their operations. Surveys identify local consumer shopping preferences as well as what and why they buy locally vs. elsewhere. Typically, 25 or more local businesses and hundreds of consumers are involved when extension works with a community. Extension provides survey results, facilitates discussions about strengths and weaknesses of local retailers and offers ideas about how to better meet customer needs. Since 1997, studies have been completed in 33 communities across Nebraska and Colorado, and have included over 650 businesses and 6,780 consumers. Several businesses have expanded or opened additional enterprises thanks to this information. In several communities, high schools have gotten involved with surveys of juniors and seniors aimed at exploring youth shopping preferences and boosting youth retention. Extension collaborates with the university's Nebraska Rural Initiative on this program to reduce economic leakage in rural communities.

Impact:
Evaluations show business owners use survey findings to improve their businesses, including employee training, product selection and marketing strategies. One western Nebraska community formed a committee to address concerns and improve the downtown shopping environment. Several businesses have expanded or opened additional enterprises based on this information.

For example, a small town dress shop owner said the information gave her a clearer picture of local customers. "We plan to implement changes based on results. We can't always compete with the big stores on price or volume, but they can't offer our level of service."

Funding:
UNL Extension
NU Rural Initiative
Nebraska Lied Main Street Program
Community-based business and economic development agencies
Smith-Lever 3(b) & (c)

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Summary:
UNL Extension's consumer preference and economic leakage program is strengthening small-town economies by working with retailers to identify ways to keep customers shopping locally. Extension works closely with local businesses on the program, which includes a consumer preference survey, analysis and discussions so small businesses understand what consumers want and identify ways to improve their operations. Since 1997, more than 650 small businesses and 6,780 consumers have participated in this extension effort in 33 Nebraska and Colorado towns. Business owners use survey findings to improve their businesses, including employee training, product selection and marketing strategies. One western Nebraska community formed a committee to address concerns and improve the downtown shopping environment. Several businesses have expanded or opened additional enterprises thanks to this information. Extension collaborates with the university's Nebraska Rural Initiative on this program.

Support Increased Economic Opportunities and Improved Quality of Life in Rural America
Topic: EDGE Program Aids Entrepreneurs

Issue:
Sparking economic growth in Nebraska's small towns is essential to their survival. A University of Nebraska–Lincoln Extension program is giving some rural entrepreneurs the skills they need to successfully create or expand businesses.

What has been done:
The Nebraska EDGE – Enhancing, Developing and Growing Entrepreneurs – program is the umbrella organization for rural entrepreneurial training programs hosted by local communities, organizations and associations. The program offers skill-based training for people who want to start or expand a business, including agricultural operations, or improve their business skills. Participants learn legal structures, market strategies, financial statements, bookkeeping, cash flow, financing and how to manage growth. More than 125 training courses have been offered from Scottsbluff to Omaha resulting in new business start-ups, business expansions and local and community economic development since the program began in 1993.

Impact:
Since 1993, Nebraska EDGE has helped nearly 2,000 Nebraskans transform their ideas into viable business opportunities, creating full- and part-time jobs across the state. In a recent survey, more than 70 percent of program participants said they had increased their business volume thanks to EDGE, while 33 percent hired additional employees. One recent EDGE participant said the program helped his business survive and is "a fundamental need in the small business community." Another said the training is a very effective way to boost rural economy. "Strengthening existing businesses gets more results than bringing in new business."

Funding:
UNL Extension
Nebraska Department of Economic Development
Nebraska Microenterprise Partnership Fund
USDA Rural Development
Community-based businesses and organizations
User fees

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Summary:
Sparking economic growth in Nebraska's small towns is essential to their survival. A UNL Extension program is giving some rural entrepreneurs the skills they need to successfully create or expand their businesses. The Nebraska EDGE – Enhancing, Developing and Growing Entrepreneurs – program is the umbrella organization for rural entrepreneurial training programs hosted by local communities, organizations and associations. Since 1993, Nebraska EDGE has helped nearly 2,000 Nebraskans transform their ideas into viable business opportunities, creating full- and part-time jobs statewide. A recent survey showed more than 70 percent of participants had increased their business volume since participating in EDGE, while 33 percent had added employees. One recent participant said EDGE helped his business survive and is "a fundamental need in the small business community." Another said the training is a very effective way to boost the economy of rural areas by strengthening existing business and encouraging entrepreneurs.

Enhance Protection and Safety of the Nation's Agriculture and Food Supply
Topic: Hazard Analysis and Critical Control Point

Issue:
To ensure the safety of meat and poultry consumers buy at the store, USDA requires meat and poultry processors to employ methods to reduce harmful bacteria, chemicals and contamination in their operations. Plants that fail to comply can be closed and contamination often sparks costly product recalls. While processors know compliance is important, it sometimes can be a challenge, especially for small processing operations.

What has been done:
University of Nebraska–Lincoln Extension, foreseeing the federal regulations, began teaching Hazard Analysis and Critical Control Point (HACCP) for processors in 1992. The regulations took effect in 1996 for large processors and in 1998 for small operations. UNL offers HACCP training to meat and poultry processing personnel to help them develop food safety programs to reduce and/or eliminate bacteria that cause food-borne illnesses. UNL faculty have worked with colleagues at Kansas State University, University of Missouri and South Dakota State University to train processors in Nebraska and surrounding states. During two or three intensive workshops offered annually, with each drawing 30 to 35 people, specialists teach processors how to develop or revise their HACCP plans. In 2005, they expanded training to teach small processors of ready-to-eat meats how to avoid the growth of *Listeria*, a potential deadly bacteria. Extension specialists also provide print resources and one-on-one consultations to solve problems. Since 2000, more than 1,000 processors have taken UNL Extension's HACCP training.

Impact:
Nebraska leads the nation in commercial livestock slaughter so safe processing is an economic as well as public health issue. Recent Centers for Disease Control and Prevention reports show that from 1996 to 2004, the incidence of *E. coli* O157:H7 infections decreased 42 percent nationwide. USDA's Food Safety and Inspection Service also found a large reduction in *E. coli* infections. In 2001 the FSIS found 59 positive tests in 6,770 ground beef samples. In 2005, 19 positive tests were found in nearly 11,000 samples. These declines are largely attributed to HACCP. An Elwood meat processing business owner said HACCP training helped employees more closely scrutinize their work and keep better records.

Funding:
UNL Extension
USDA CSREES grant
USDA Food Safety and Inspection Service grant
Smith-Lever 3(b) & (c)

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Summary:
Meat safety is an economic as well as public health issue in Nebraska, which leads the nation in commercial livestock slaughter. UNL food safety and meat specialists work closely with processors, especially small operators, to help them implement and update federally-mandated food safety programs for their operations. UNL Extension has provided training on this system, called Hazard Analysis and Critical Control Point, or HACCP, since 1992. Since 2000, extension has helped more than 1,000 small and very small processors adopt HACCP. As a result of HACCP, *E. coli* O157:H7 infections nationally were reduced sharply, according to the Centers for Disease Control and Prevention and the Food Safety and Inspection Service. An Elwood meat processor said extension's HACCP training helped his employees more closely scrutinize their work and keep better records.

Enhance Protection and Safety of the Nation's Agriculture and Food Supply
Topic: Mobile Plant Diagnostic Lab Ready to Detect Plant Diseases

Issue:
Whether they occur naturally, accidently or intentionally, rapidly identifying plant diseases is critical to controlling their spread and mitigating their impact. In this era of agrosecurity concerns, rapidly diagnosing a potential problem on the spot is important.

What has been done:
In 2005, University of Nebraska–Lincoln Extension launched its new Mobile Plant Diagnostic Lab, the nation's most advanced traveling plant diagnostic lab. Funded through the Department of Homeland Security and UNL Extension, the lab is available to respond to any potential agrosecurity threat and to help farmers diagnose plant diseases on the spot. For example, if soybean rust were to enter Nebraska, the mobile lab would allow UNL plant pathologists to test suspect plants on site and provide results within two hours. The lab is equipped with the latest technology and equipment, including molecular diagnostic tools and satellite communications, for immediate notification of state and federal agencies. The lab also is being used at field days statewide for farmers to bring in plant samples and to increase awareness of plant diseases.

Impact:
Thanks to this lab, Nebraska is better prepared to quickly detect plant disease and respond to potential agrosecurity threats on site. The lab also can provide results in hours instead of the several days typically needed to mail samples to the university's on-campus lab. The speedy response could be especially critical in a case of agroterrorism or a severe disease outbreak.

Funding:
U.S. Department of Homeland Security/Nebraska Department of Agriculture
UNL Extension

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Summary:
Nebraska is better prepared to detect plant disease problems on the spot thanks to UNL Extension's new Mobile Plant Diagnostic Lab. The lab, which began operating in 2005, is the most advanced of its kind in the nation. Funded by the U.S. Department of Homeland Security and UNL Extension, the lab can be pulled anywhere it's needed to respond to potential agrosecurity threats or to help farmers diagnose diseases threats, whether they occur naturally, intentionally or accidently. Equipped with the latest technology, the lab is able to provide results within two hours and to immediately notify state or federal regulators if necessary. Before the mobile lab, it often took several days for samples to be mailed to and analyzed at the university's on-campus diagnostic lab. The mobile lab will travel to field days statewide and provide plant sample test results before growers leave the site.

Enhance Protection and Safety of the Nation's Agriculture and Food Supply
Topic: Research Aids Labeling Decisions

Issue:
For most people, food labels provide helpful nutritional information. For people with food allergies, accurate labels can be a matter of life and death.

What has been done:
An international study by University of Nebraska–Lincoln food scientists found that highly refined soybean oil does not trigger reactions in soy-sensitive people. Refined soy oil is commonly used in foods worldwide. Findings don't apply to cold-pressed soy oil, which has higher levels of protein, or allergens, that may present a risk to soy-allergic consumers and should be labeled. These UNL Food Allergy Research and Resource Program scientists shared their findings internationally with policymakers, congressional staffers, industry, farmers and consumers.

Impact:
The UNL findings provided scientific evidence for European Union food allergen labeling decisions in 2005 and the U.S. Food Allergen Labeling and Consumer Protection Act of 2004. The EU temporarily exempted highly refined soy oil from food allergen labeling regulations. Earlier, U.S. regulators exempted highly refined vegetable oils derived from known allergens, such as soybeans or peanuts, from the federal food allergen labeling law that took effect this year. These decisions helped preserve farmers' widest possible access to world markets and expanded the types of foods soy-allergic people know they can safely consume.

Funding:
United Soybean board
Private food companies
UNL Agricultural Research Division
Hatch Act

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Summary:
UNL soybean oil research is influencing food allergen labeling laws here and abroad. An international study by IANR food scientists confirmed that highly refined soybean oil does not cause reactions in people who are allergic to soybeans. Scientists shared the Food Allergy Research and Resource Program study results internationally. Their findings played a role in European Union food allergen labeling decisions in 2005 and the U.S. Food Allergen Labeling and Consumer Protection Act of 2004. These decisions helped preserve soybean growers' widest possible access to world markets. Results assure soy-allergic consumers that they can safety eat a wider range of processed foods if they contain only refined soy oil.

Enhance Protection and Safety of the Nation's Agriculture and Food Supply
Topic: Soybean Rust

Issue:
Soybean rust is a new major disease worry for growers nationwide. University of Nebraska–Lincoln plant pathologists are studying this threat and providing resources to ensure Nebraska farmers are ready to combat soybean rust if it strikes the state.

What has been done:
Plant pathologists created a one-stop soybean rust resource Web site at http://soybeanrust.unl.edu. Extension teamed with the Nebraska Soybean Board to offer a toll-free phone line with recorded updates and management information, and specialists and extension educators developed publications with specifics farmers can use to prepare. UNL plant pathologists also conducted 13 field trials across Nebraska in 2005.

Impact:
This Institute of Agriculture and Natural Resources research and extension effort and close collaboration with the Nebraska Soybean Board has helped growers learn about and prepare for this new disease. Research will provide practical, science-based information growers and companies will use to control rust under Nebraska conditions. Researchers will use preliminary results and future field trials to devise an integrated soybean rust management program for Nebraska growers.

Funding:
UNL Agricultural Research Division
UNL Extension
North Central Soybean Research Program
USDA Animal and Plant Health Inspection Service
Nebraska Soybean Board
Hatch Act
Smith-Lever 3(b) & (c)

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Summary:
Soybean rust is a new major disease worry for growers nationwide. UNL plant pathologists are working to ensure Nebraska farmers have the information and resources to combat soybean rust if it strikes the state. In 2005, plant pathologists created a one-stop soybean rust resource Web site at http://soybeanrust.unl.edu. Extension teamed with the Nebraska Soybean Board to offer a toll-free phone line with recorded updates and management information and specialists and extension educators developed publications with specifics farmers can use to prepare. Researchers conducted 13 field trials statewide. This IANR research and extension effort and close collaboration with the Nebraska Soybean Board has helped growers learn about and prepare for this new disease. Research findings will provide practical, science-based information growers and companies will use to control rust under Nebraska conditions.

Enhance Protection and Safety of the Nation's Agriculture and Food Supply
Topic: Terrorism's Impact on U.S. Grain System

Issue:
A terrorist attack on the nation's grain marketing infrastructure could mean major losses in U.S. grain exports. Quantifying the potential economic damage is important to homeland security efforts.

What has been done:
A University of Nebraska–Lincoln agricultural economist analyzed the impact of grain handling disruptions at the Port of New Orleans, which handles up to three-quarters of U.S. corn exports. It is part of ongoing multistate research quantifying economic ramifications of a terrorist attack on the nation's grain marketing system. Researchers projected economic impacts of reducing the port's corn export volume by 10 percent, 15 percent and 25 percent for a year.

Impact:
This Institute of Agriculture and Natural Resources study found that a moderate disruption at this critical port would cost the U.S. $600 million to $900 million in annual export losses. It also found that world demand for corn probably could not be met if U.S. exports dropped more than 25 percent. Findings provide information for national security officials who must plan for possible terrorist attacks. They also offered insights into the potential economic losses caused by Hurricane Katrina's disruption of grain exports at the port.

Funding:
USDA-CSREES multistate project
UNL Agricultural Research Division
Hatch Act

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Summary:
A terrorist attack on the nation's grain marketing infrastructure could mean major losses in U.S. grain exports. Quantifying that economic damage is important to homeland security planning. An IANR agricultural economist's study shows that a moderate disruption at the critical Port of New Orleans would cost the U.S. $600 million to $900 million in annual export losses. It is part of ongoing multistate research quantifying economic ramifications of a terrorist attack on the nation's grain marketing system. This research assessed the economic impacts of reducing corn export volume by 10 percent, 15 percent and 25 percent for a year at the port. Findings provide information for national security officials who must plan for possible terrorist attacks. They also offered insights into the potential economic losses caused by Hurricane Katrina's disruption of grain exports at the port.

Improve the Nation's Nutrition and Health
Topic: Food Allergen Tests

Issue:
Consumers with food allergies and food processing companies both want to be sure that traces of food allergens don't unintentionally end up in foods where they are not a labeled ingredient. For people with food allergies, such cross-contamination can result in potentially life-threatening reactions.

What has been done:
University of Nebraska–Lincoln food scientists are leaders in developing tests that allow companies to rapidly, accurately detect minute traces of an allergenic food on equipment or in foods processed on shared equipment. In 2005, the team's new test for soy flour became commercially available. The team earlier developed tests for peanuts, milk, eggs, almonds and wheat gluten. A test for hazelnuts could be commercialized in 2006. All these tests are commercially available to the food industry through a university licensing agreement with Neogen, a Michigan company.

Impact:
Soy, milk, eggs, peanuts, tree nuts and wheat are among the eight common foods responsible for all food allergic reactions so developing rapid tests for these foods is helping industry address some cross-contamination concerns. Widespread industry use of these UNL-developed tests has helped industry make foods safer for people with food allergies.

Funding:
UNL Agricultural Research Division
UNL Food Allergy Research and Resource Program member companies
USDA
Hatch Act

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Summary:
The food industry is using tests developed by UNL food scientists to protect allergic consumers by ensuring their products contain only the intended ingredients. These tests allow companies to rapidly detect traces of a specific allergenic food on equipment or in foods processed on shared equipment. That's important because even a small amount of an allergenic food can cause serious reactions in people who are sensitive to that food. In 2005, the team's test for soy flour became commercially available. Researchers earlier devised tests for peanuts, milk, eggs, almonds and wheat gluten. The tests are commercially available to industry through a university licensing agreement with Neogen, a Michigan company. Widespread industry use of these UNL-developed tests is helping food manufacturers make their foods safer for people with food allergies.

Improve the Nation's Nutrition and Health
Topic: Growing H.O.P.E.

Issue:
Omaha's low-income residents rely on food banks for enough food to eat. While donations help, fresh produce is always in demand.

What has been done:
To help fill the need for fresh, nutritious vegetables, University of Nebraska–Lincoln Extension in Douglas-Sarpy counties started Growing H.O.P.E. (Helping Omaha's People Eat). Faithful Shepherd Presbyterian Church donated land for a garden. Extension Master Gardeners plant and tend vegetables, donating their time to till, weed, water and harvest the garden. Extension and local businesses provide plants, seed and money, and volunteers log about 500 volunteer hours annually working the garden. This hunger prevention project started its third year in 2006.

Impact:
The garden yields about 2 tons of produce valued at $10,000 each year. Most produce is donated to five area food banks. Extension uses some vegetables to teach lower-income residents about nutrition through its Nutrition Education Program courses. Organizers of the garden educate residents about horticultural, dietary and urban issues as well as provide food for the hungry.

Funding:
UNL Extension
Local businesses
Smith-Lever 3(b) & (c)

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Summary:
Omaha's food banks always need fresh produce to help feed the city's hungry. University of Nebraska–Lincoln Extension in Douglas-Sarpy counties is helping meet that need through its Growing H.O.P.E. (Helping Omaha's People Eat) project. Extension Master Gardener volunteers plant, tend and harvest a vegetable garden on land donated by a local church. Businesses and extension provide seed and supplies. 2006 marks the third year for the hunger prevention effort. The garden yields about 2 tons of produce valued at $10,000 each year. Most produce is donated to five area food banks. Extension uses some vegetables to teach lower-income residents about nutrition through its Nutrition Education Program courses.

Improve the Nation's Nutrition and Health
Topic: Hazard Analysis and Critical Control Point

Issue:
To ensure the safety of meat and poultry consumers buy at the store, USDA requires meat and poultry processors to employ methods to reduce harmful bacteria, chemicals and contamination in their operations. Plants that fail to comply can be closed and contamination often sparks costly product recalls. While processors know compliance is important, it sometimes can be a challenge, especially for small processing operations.

What has been done:
University of Nebraska–Lincoln Extension, foreseeing the federal regulations, began teaching Hazard Analysis and Critical Control Point (HACCP) for processors in 1992. The regulations took effect in 1996 for large processors and in 1998 for small operations. UNL offers HACCP training to meat and poultry processing personnel to help them develop food safety programs to reduce and/or eliminate bacteria that cause food-borne illnesses. UNL faculty have worked with colleagues at Kansas State University, University of Missouri and South Dakota State University to train processors in Nebraska and surrounding states. During two or three intensive workshops offered annually, with each drawing 30 to 35 people, specialists teach processors how to develop or revise their HACCP plans. In 2005, they expanded training to teach small processors of ready-to-eat meats how to avoid the growth of *Listeria*, a potential deadly bacteria. Extension specialists also provide print resources and one-on-one consultations to solve problems. Since 2000, more than 1,000 processors have taken UNL Extension's HACCP training.

Impact:
Nebraska leads the nation in commercial livestock slaughter so safe processing is an economic as well as public health issue. Recent Centers for Disease Control and Prevention reports show that from 1996 to 2004, the incidence of *E. coli* O157:H7 infections decreased 42 percent nationwide. USDA's Food Safety and Inspection Service also found a large reduction in *E. coli* infections. In 2001, the FSIS found 59 positive tests in 6,770 ground beef samples. In 2005, 19 positive tests were found in nearly 11,000 samples. These declines are largely attributed to HACCP. An Elwood meat processing business owner said HACCP training helped employees more closely scrutinize their work and keep better records.

Funding:
UNL Extension
USDA CSREES grant
USDA Food Safety and Inspection Service grant
Smith-Lever 3(b) & (c)

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Summary:
Meat safety is an economic as well as public health issue in Nebraska, which leads the nation in commercial livestock slaughter. UNL food safety and meat specialists work closely with processors, especially small operators, to help them implement and update federally-mandated food safety programs for their operations. UNL Extension has provided training on this system, called Hazard Analysis and Critical Control Point, or HACCP, since 1992. Since 2000, extension has helped more than 1,000 small and very small processors adopt HACCP. As a result of HACCP, *E. coli* O157:H7 infections nationally were reduced sharply, according to the Centers for Disease Control and Prevention and the Food Safety and Inspection Service. An Elwood meat processor said extension's HACCP training helped his employees more closely scrutinize their work and keep better records.

Improve the Nation's Nutrition and Health
Topic: Medicare Prescription Card Awareness Program

Issue:
The 2003 Medicare Reform Act added the first-ever prescription drug benefit to the program, prompting questions, confusion and concerns for Medicare recipients and their families facing a gauntlet of paperwork and choices.

What has been done:
Beginning in 2004, University of Nebraska–Lincoln Extension participated in a pilot program to educate and enroll eligible Nebraskans – one of five extension systems across the country to partner with the USDA on the effort. The Nebraska campaign was titled "The Greatest Gift You Can Give a Senior Citizen This Year is a Prescription Drug Card." The initial campaign, to encourage enrollment in a temporary prescription drug card program, was publicized via contacts with more than 200 civic organizations, more than 350 news releases, columns and public service announcements, as well as TV and radio spots, interviews and public presentations. Throughout the state, handouts and flyers promoting the campaign were distributed in extension and medical offices, grocery stores, medical facilities, senior centers, senior housing units and elsewhere. Youth and adult volunteers distributed Medicare worksheets and enrollment forms and helped with one-on-one enrollment sessions. In 2005, extension joined with other state and local agencies to form the Nebraska Prescription Drug Coalition to help recipients apply for the new, permanent program that began Jan. 1, 2006. That effort includes 30 local coalitions across Nebraska that help answer Medicare recipient questions and help them enroll.

Impact:
In 2004-2005, at least 530 Medicare recipients enrolled for prescription drug cards as a result of this effort, leading to a potential savings of at least $820,320. More than 430 Medicare recipients received individual assistance with the enrollment process. About 840 people requested worksheets and used them to enroll themselves or others, including more than 450 adult children or caregivers. One north-central Nebraskan who was paying $220 a month for prescriptions paid less than $20 a month with the new card. Another recipient, in northeast Nebraska, saved more than $500 a month.

Funding:
USDA Cooperative State Research Extension and Education Service
UNL Extension
Special Project dollars provided by CSREES

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Summary:
The 2003 Medicare Reform Act's prescription drug benefit to the program has prompted questions, confusion and concerns for Medicare recipients and their families facing a gauntlet of paperwork and choices. UNL Extension was one of five extension systems in the country tapped by the USDA to participate in a pilot program to educate and enroll eligible beneficiaries. The Nebraska campaign, titled "The Greatest Gift You Can Give a Senior Citizen This Year is a Prescription Drug Card," was widely publicized via media, presentations and civic organizations. Volunteers distributed Medicare worksheets and enrollment forms and helped with one-on-one enrollment sessions. At least 530 Medicare recipients enrolled for prescription drug cards as a result of this effort in 2004-05, leading to a potential savings of at least $820,320. More than 430 Medicare recipients received individual assistance with the enrollment process. About 840 people requested worksheets and used them to enroll themselves or others. One north-central Nebraskan who was paying $220 a month for prescriptions paid less than $20 a month with the new card.

Improve the Nation's Nutrition and Health
Topic: Methamphetamine Community Awareness Program

Issue:
Methamphetamine production and use have reached epidemic levels in parts of the United States. Rural areas in Nebraska and elsewhere are especially vulnerable because supplies to make the drug can be easily found there. This epidemic threatens families and communities.

What has been done:
University of Nebraska–Lincoln Extension teamed with 3rd District Rep. Tom Osborne to promote community awareness of the drug's dangers. In 2005, over 4,000 Nebraskans learned about meth from presentations and educational handouts. Nearly 30,000 Extension publications and handouts were distributed. The "Nebraska Cleanup Volunteer Safety" DVD and brochure were distributed to every Nebraska county by UNL Extension and Keep Nebraska Beautiful. Extension also has provided information about anhydrous ammonia theft and its relationship to meth production, which has been shared at pesticide training.

Impact:
Six months after the meth program was presented in Indianola, law enforcement there reported a significant decrease in meth activity. The local sheriff attributed it to increased community awareness, including neighborhood "meth walks" and increased citizen monitoring and reporting. Also, in communities where the program has been presented, volunteer clean-up groups are more knowledgeable about meth lab litter safety, thanks to distribution of the volunteer safety DVD and brochure.

Funding:
UNL Extension
Nebraska State Patrol
Keep Nebraska Beautiful grant from Department of Environmental Quality
Midwest High-Intensity Drug Trafficking Areas program
Smith-Lever 3(b) & (c)
User fees

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Summary:
Methamphetamine production and use is epidemic in parts of the U.S. Rural areas in Nebraska and elsewhere are especially vulnerable because supplies to make the drug can be easily found there. If this epidemic goes unchecked, it can tear apart families and communities and overwhelm legal, medical and social resources. UNL Extension teamed with 3rd District Rep. Tom Osborne to promote community awareness of the drug's dangers. In 2005, over 4,000 Nebraskans learned about meth from presentations and educational handouts. Nearly 30,000 Extension publications and informational materials were distributed. The "Nebraska Cleanup Volunteer Safety" DVD and brochure were distributed to every Nebraska county by UNL Extension and Keep Nebraska Beautiful. Six months after the meth program was presented in Indianola, law enforcement there reported a significant decrease in meth activity thanks to increased community awareness, including neighborhood "meth walks" and increased citizen monitoring and reporting. Also, in communities where the program has been presented, volunteer clean-up groups are more knowledgeable about meth lab litter safety, thanks to distribution of the volunteer safety DVD and brochure.

Improve the Nation's Nutrition and Health
Topic: Operation Military Kids

Issue:
Daily life can be tough for children whose parents are serving far from home with the National Guard and Reserve. They miss their parents, their family routine has changed and they may face emotional or financial hardships. They need support from friends who understand these challenges. Recent deployments have affected families in most of Nebraska's counties since 2001.

What has been done:
University of Nebraska-Extension 4-H participates in a national initiative launched in 2004 called Operation Military Kids. 4-H'ers statewide participate in activities to support children whose parents are deployed in the guard or reserve and to raise awareness of the challenges they face. 4-H'ers assembled Hero Packs, which are backpacks containing 4-H paraphernalia like piggy banks and caps and hand-written letters from a 4-H member thanking the children for their sacrifice. In 2005, 10 4-H'ers met with Nebraska's congressional representatives in Washington, D.C., to discuss challenges military kids face. These 4-H'ers have since spoken at school assemblies and to service groups across Nebraska to raise awareness. New initiatives that are part of Operation Military Kids include Ready, Set, Go – a 4-H curriculum that will teach members to raise awareness about these military children in their communities.

Impact:
This project is providing peer support for Nebraska kids whose parents are deployed with the Guard and Reserves. It also is helping the 4-H'ers involved build community service and leadership skills. In 2005, about 250 children whose parents are in the military received Hero Packs. The 500 Nebraska 4-H'ers who made the kits also learned more about the challenges of these children. The 10 youth who traveled to Washington have also honed their public speaking skills.

Funding:
4-H Army Youth Development Project
UNL Extension
Special Project Dollars as provided by CSREES

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Summary:
Daily life can be tough for children whose parents are serving far from home with the National Guard and Reserve. They miss their parents, their family routine has changed and they may need new support systems. University of Nebraska–Lincoln Extension 4-H is helping support these children through Operation Military Kids. About 500 4-H'ers assembled Hero Packs to distribute to children who had a parent deployed in 2005. The packs contain 4-H paraphernalia and a letter from a 4-H'er thanking the military children for their sacrifices. About 250 children received these packs in 2005. In addition, 10 Nebraska 4-H'ers traveled to Washington, D.C., to raise awareness among the state's congressional delegation about the challenges faced by these children and have spoken at schools and meetings statewide to raise awareness. It's a win-win. Kids whose parents are in the military receive peer support while 4-H'ers develop valuable leadership and community service skills.

Protect and Enhance the Nation's Natural Resource Base and Environment
Topic: Groundwater Level Monitoring

Issue:
Nebraska has some of the world's most abundant groundwater supplies, but groundwater levels have dropped in many areas in recent years. Natural resources managers, irrigators and policymakers need current information to better assess and manage this valuable resource.

What has been done:
For 75 years, the University of Nebraska's groundwater monitoring program has annually recorded and published Nebraska groundwater level rises and declines. Today, the program uses early spring readings from more than 5,400 irrigation, domestic, observation and monitoring wells. Yearly changes and cumulative changes since irrigation development began are published as colored maps and are available online. In 2005, the program published a map depicting widespread groundwater level declines from 2000 to 2005, the period of the current drought. Through a partnership with USDA's Risk Management Agency, the program is placing satellite uplinks and associated technology on 52 rapid response wells. This new technology, which will be available on the Internet by fall 2007, will provide current well level readings online to anyone with a computer.

Impact:
Annual and longer-term groundwater level information have long been used by decision makers and resource managers to set policies related to groundwater pumping and to make key decisions about how to use this resource. Recent drought, coupled with recent water policy and legal decisions, has increased the need for current groundwater information. The new rapid monitoring program will provide immediate snapshots of groundwater conditions across the state to aid growers and policymakers.

Funding:
UNL Agricultural Research Division
USDA Risk Management Agency
Hatch Act

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Summary:
UNL water researchers are teaming with the USDA's Risk Management Agency to provide current groundwater levels across Nebraska via the Internet. For 75 years, the university has recorded levels in groundwater wells statewide and reported findings annually in publications to aid decisions about groundwater use, management and policy. Those color maps also are available online. Through the new partnership, satellite uplink and computer equipment is being installed on 52 of the 5,400 wells monitored statewide to compile groundwater data. This will allow information about current levels to be shared immediately via the Web. Recent drought, coupled with recent water policy and legal decisions, has increased the need for more timely groundwater information. The new rapid monitoring program, which will be available on the Internet by fall 2007, will provide a real-time snapshot of groundwater status.

Protect and Enhance the Nation's Natural Resource Base and Environment
Topic: On-site Wastewater Treatment and Management

Issue:
Poor design, improper installation or inadequate maintenance can cause on-site wastewater systems to fail, contaminating water and soil and sometimes exposing people to disease-causing pollutants.

What has been done:
University of Nebraska–Lincoln Extension provides on-site wastewater system training for rural homeowners and installers, pumpers and inspectors. Extension helped establish the Nebraska Onsite Waste Water Association. This association sought state legislation to require state certification for on-site installers, pumpers and inspectors starting in 2006. Extension developed and taught on-site wastewater management classes for these professionals, focusing on water quality/environment, engineering/groundwater and biology/soils. In 2005, more than 630 people voluntarily participated in extension training. Extension also has taught rural residents, including acreage owners, how to maintain their septic or residential lagoon systems and spot problems.

Impact:
Educating both those who own and maintain on-site wastewater systems and those who work on them is helping to protect Nebraska's environment and human health. Among installers, pumpers and inspectors, preliminary analysis indicated that 90 percent of those who participated in extension education passed certification tests administered by the Nebraska Department of Environmental Quality. Among acreage owners who participated in extension training, 89 percent said they would take steps to reduce environmental risks from their on-site system.

Funding:
UNL Extension
Nebraska Department of Environmental Quality
U.S. Environmental Protection Agency
Workshop registration fees
Smith-Lever 3(b) & (c)

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Summary:

Poor design, improper installation or inadequate maintenance can cause on-site wastewater systems to fail, which can contaminate water and soil or expose people to disease-causing pollutants. Starting in 2006, on-site wastewater treatment system installers, pumpers and inspectors must be certified by examination through the Nebraska Department of Environmental Quality. UNL Extension developed classes to help these people learn about the state requirements and the science of on-site wastewater treatment. In 2005, extension educated more than 630 installers, pumpers and inspectors who voluntarily attended the training. Preliminary analysis indicated that 90 percent of participants passed the state-administered certification test. Extension also teaches rural homeowners how to properly maintain their septic or residential lagoon systems and to spot problems. As a result, 89 percent of participants in clinics for acreage owners said they would take steps to reduce environmental risks associated with their on-site system.

Protect and Enhance the Nation's Natural Resource Base and Environment
Topic: Water Optimizer

Issue:
Nebraska irrigators facing water shortages must make difficult and complex choices about how best to use limited water.

What has been done:
An agricultural economist and a biological systems engineer at the University of Nebraska–Lincoln developed the Water Optimizer. This decision-support computer program became available in 2005 to help farmers make better-informed cropping choices such as determining whether it would be most profitable to grow different crops, irrigate fewer acres, apply less water to existing crops or go to dryland farming. Growers load information about their operation such as the amount of water available, soil type, irrigation system type and fuel type for irrigation. They also enter production costs, irrigation costs, crop prices and crop type. The Water Optimizer is available on the Web at http://extension-water.unl.edu/ or on a DVD/CD set and was promoted at dozens of UNL Extension meetings in 2005.

Impact:
This Institute of Agriculture and Natural Resources-developed tool is helping Nebraska farmers make more informed choices that conserve water and producer profits. Nearly 700 users downloaded or purchased the tool in 2005.

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

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Summary:
Nebraska irrigators facing water shortages have a new tool to help them make difficult and complex choices about how best to use their limited water supplies. The Water Optimizer, a decision-support computer program developed by IANR researchers, became available in 2005 to help farmers make more informed choices that conserve water and producer profits. Nearly 700 producers downloaded or purchased the tool in 2005. It lets users enter individualized information and calculate what crops will be most profitable with the given costs and available water. By running "what if" scenarios, growers can see the best options for farming with limited water, whether it be growing different crops, irrigating fewer acres, applying less water to existing crops or going to dryland farming.

Protect and Enhance the Nation's Natural Resource Base and Environment
Topic: Drought Mitigation Research

Issue:
Drought is the costliest natural disaster in the U.S., with an annual impact of $6 billion to $8 billion that belies its slow, creeping nature. Accurate monitoring and predictions of drought are key to helping control its effects.

What has been done:
About six years after it launched its now widely used Drought Monitor in collaboration with the U.S. Department of Agriculture and National Oceanic and Atmospheric Administration, the University of Nebraska–Lincoln-based National Drought Mitigation Center continues to develop new tools for monitoring and preparing for drought and mitigating its impacts. The Vegetation Response Drought Index, a collaboration with the U.S. Geological Survey's Earth Resources Observation System Data Center in Sioux Falls, S.D., incorporates satellite and climate data that allows analysis of drought square mile by square mile by detecting vegetation stress. The Drought Impact Reporter is developing a nationwide database of drought impacts and gives the public a forum to provide input about its specific effects. New USDA funding, announced in 2005, supports an effort by climatologists and computer scientists to bring cutting-edge computer science technologies to producers' decision-making through the National Agricultural Decision Support System and other Web-based tools. Ongoing workshops for producers are providing valuable feedback that's helping tool developers enhance existing tools and develop new ones. In the planning stages is an online drought atlas that will provide producers a snapshot of drought risk on a local level.

Impact:
The National Drought Mitigation Center has helped lead a shift in drought planning from reactive crisis management to proactive risk management. The Drought Monitor, Vegetation Response Drought Index, National Agricultural Decision Support System and other tools in use or under development by the center share one trait: They help policymakers and citizens plan for drought and reduce its impacts, rather than attempting to fix the damage after it's done.

Funding:
UNL Agricultural Research Division
USDA, Cooperative State Research Education and Extension Service
USDA Risk Management Agency
U.S. Geological Survey
National Oceanic and Atmospheric Administration
Hatch Act

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Summary:
Drought is the costliest natural disaster in the U.S., with an annual impact of $6 billion to $8 billion. Accurate monitoring of drought and improved preparedness helps reduce that impact. The UNL-based National Drought Mitigation Center, collaborating with state, regional and national partners, continues to develop and enhance tools for predicting and mitigating drought. Best known is the widely used Drought Monitor. Others tools include the Vegetation Response Drought Index, which incorporates satellite data that provides an analysis of drought square mile by square mile by detecting differences in the temperatures of vegetation; the Drought Impact Reporter, which gives the public a forum to provide data about drought's specific effects; the National Agricultural Decision Support System, which is bringing cutting-edge computer science technologies to agricultural producers' decision-making; and an online drought atlas that will provide producers with a snapshot of drought risk on a local level. Together, these tools are helping to change U.S. drought response from reactive crisis management to proactive risk management.

Protect and Enhance the Nation's Natural Resource Base and Environment
Topic: Republican River Basin Irrigation Management Project

Issue:
Faced with continued drought and looming water restrictions, making the most of every drop of irrigation water can literally make or break many southwest Nebraska farmers.

What has been done:
The University of Nebraska–Lincoln Extension's Republican River Basin Irrigation Management Project demonstrates research-based irrigation management strategies in farmers' fields and provides practical information for implementing these practices. The project features year-round educational presentations on water conservation and tours of demonstration sites, which give producers and crop consultants a firsthand look at how these water-saving practices work. In 2005 alone, 230 people attended the seven summer field days.

Impact:
Program participants estimate the knowledge gained from this program will save them an average 2.1 inches of water per acre, a 10 percent to 15 percent savings over typical irrigation use in the area. Based on the number of participants in 2005 and the acres they irrigate, that amounts to more than 35,000 acre-feet of water annually – enough water to cover 35,000 acres of land with a foot of water. Participants also estimated the knowledge gained through this program is worth an average of about $16,073 per operation or, conservatively, nearly $2.9 million annually.

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

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Summary:
The Republican River Basin Irrigation Management Project is helping farmers in water-short southwest Nebraska learn research-based techniques for conserving irrigation water. UNL Extension demonstrates research-based irrigation management strategies in farmers' fields, offers field tours and provides year-round educational presentations on water conservation. In 2005 alone, 230 people attended the seven summer field days. Program participants estimate the knowledge gained from this program will save them an average 2.1 inches of water per acre, a 10 percent to 15 percent savings over typical irrigation use in the area. Based on the number of participants in 2005 and the acres they irrigate, that amounts to more than 35,000 acre-feet of water annually – enough water to cover 35,000 acres of land with a foot of water. Participants also estimated the knowledge gained through this program is worth an average of about $16,073 per operation or, conservatively, nearly $2.9 million annually.

Society-Ready Graduates
Topic: Ag Economics Protege Program

Issue:
Even the best classroom learning alone can't fully prepare students for the realities of a job search and career responsibilities. Some real-world experience helps round out the total college learning experience.

What has been done:
The University of Nebraska–Lincoln Agricultural Economics/Agribusiness Club protege program gives students the chance to meet and interact with professionals in their fields of interest. The program features a job shadowing program that allows students to follow people in banking, trade associations, farm cooperatives, commodity groups, communications and other professions. A shadowing experience can run from several hours to a day or more. Participating professionals, students and faculty also get together for an annual banquet.

Impact:
The protege program connects students with potential employers and gives them a firsthand look at potential career choices. The program gives students a better notion of whether a particular job would be a good fit for them. Participating professionals also benefit by keeping in touch with students and knowing what they're learning in class.

Funding:
Agricultural Economics/Agribusiness Club dues, fundraising

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Summary:
Getting a real-world look at their potential careers gives some UNL College of Agriculture and Natural Resources students a leg up on choosing a profession and meeting prospective employers. The Agricultural Economics/Agribusiness Club protege program gives students the chance to meet and interact with professionals in their fields of interest. A job shadowing program lets students follow people in banking, trade associations, farm cooperatives, commodity groups, communications and other professions. This program connects students with potential employers and gives them a firsthand look at potential career choices. Participating professionals also benefit by keeping in touch with students and knowing what they're learning in class.

Society-Ready Graduates
Topic: Big Red Summer Academic Camps

Issue:
National research indicates that young people who visit a college campus are more likely to enroll on that campus. Countless studies also have shown the value of a college education, including a 2004 U.S. Census estimate that college graduates earn an average of $51,568 a year compared to $28,631 for high school graduates.

What has been done:
To increase the likelihood of students acquiring a college education and gaining skills to lead productive lives in the 21st century, University of Nebraska–Lincoln Extension 4-H teams with colleges across the UNL campus to offer Big Red Summer Academic Camps to students in grades 8-12. Camps are a chance for youth to explore career opportunities, increase their life skills, visit campus and investigate an interest or potential career while having fun. The week-long residential experiences, led by UNL faculty, offer hands-on opportunities in specific career fields, including Web design, fashion design, culinology, child development, theater, movie making and golf management. Each camp ends in a capstone event where students showcase their work and skills learned for faculty, family, friends and other campers. For example, theater students scripted, filmed and edited movies that were shown at UNL's Mary Riepma Ross Theatre. Culinology students developed the menu, created the ambience and prepared a five-course luncheon for 50 guests.

Impact:
In 2005, 30 percent of campers said the camp encouraged them to explore UNL as a college choice and 7 percent decided to attend UNL. Also, 48 percent believed they increased their knowledge of various topics and 45 percent felt better prepared for the future. Of those who attended in 2003 and now are college-age, 20 percent enrolled at UNL. Of those who attended in 2004 and are now college-age, 73 percent are enrolled at UNL.

Funding:
UNL Extension
Registration fees
User fees
Smith-Lever 3(b) & (c)

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Summary:
National research indicates young people who visit a college campus are more likely to enroll on that campus, and countless studies have shown the value of a college education to a graduate's earning potential. To increase the college-going rate among Nebraskans, University of Nebraska–Lincoln Extension 4-H teams with colleges across the campus to offer Big Red Summer Academic Camps to students in grades 8-12. These camps allow youth to explore career opportunities, increase their life skills, visit the UNL campus, investigate an interest or potential career while having fun and showcasing what they learn. Career fields include Web design, fashion design, culinology, child development, theater, movie making and golf management. For example, theater students scripted, filmed and edited movies that were shown at UNL's Mary Riepma Ross Theatre. Culinology students developed the menu and prepared a five-course luncheon for 50 guests. In 2005, 30 percent of campers said the camp encouraged them to explore UNL as a college choice, 7 percent decided to attend UNL and 45 percent felt better prepared for the future.

Society-Ready Graduates
Topic: Hands-on Research Experience

Issue:
Combining hands-on research opportunities with traditional course work enriches undergraduate education, but finding such opportunities can be a challenge for students.

What has been done:
The University of Nebraska–Lincoln Undergraduate Creative Activities and Research Experiences Program, known as UCARE, funds research partnerships between faculty and undergraduates. In the first year, students receive guidance from their faculty adviser and work independently on a research project the second year. Sixty-three College of Agricultural Sciences and Natural Resources students participated in UCARE during the 2005-06 school year. Since the program started in 2000, 262 CASNR students have participated.

Impact:
Students say the real-world research experience UCARE provides broadens their education, provides insights about their careers and better prepares them for the workforce. For example, one food science and technology senior helped start-up food companies develop new products by working on food safety, ingredient functionality and processing requirements. She said it taught her important skills that will make her more employable when she graduates. An animal science senior studied the effects of nutritional diets during gilt development. She said the experience provided valuable training in genetics as well as a taste of what she could do in her career.

Funding:
Pepsi Endowment
UNL Program of Excellence Funds

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Summary:
Many UNL undergraduates get the chance to apply what they learn in the classroom to hands-on research projects that enhance their educational experience, let them glimpse career possibilities and improve their job skills. UNL's Undergraduate Creative Activities and Research Experiences Program, or UCARE, funds research partnerships between UNL undergrads and faculty advisers. Students enrolled in UCARE work with an adviser the first year and conduct independent research the second year. Sixty-three students from the College of Agricultural Sciences and Natural Resources participated in UCARE during the 2005-06 school year and 262 have participated since the program started in 2000. A food science and technology major who helped start-up food companies develop new products said the experience will make her more employable when she graduates. Another participant said she learned more about genetics and possible career opportunities in animal science through UCARE.

Society-Ready Graduates
Topic: Helping Children Resolve Conflicts

Issue:
Children arguing is common even in a child-care setting. Adults can simply solve the problem for children, but that doesn't teach the children how to resolve their conflict, a skill they'll need throughout their lives.

What has been done:
University of Nebraska–Lincoln Extension is teaching early childhood professionals a new, more effective way to settle squabbles based on research by a UNL family scientist. During training sessions for early childhood professionals, extension teaches conflict mediation skills and how to help preschoolers learn to resolve their own conflicts. Nearly 3,000 early childhood professionals, educators and foster parents have received education at nearly 20 trainings statewide in the past two years.

Impact:
More than 94 percent of program participants report they have a high level of understanding about methods for resolving conflicts with children, thanks to this training. As a result of this training, participants reported they will listen to children better and be more patient. Participants said they learned to give each child the appropriate amount of time to tell their side, then help them understand what they can and cannot do. They are using this knowledge to help children in their care resolve conflicts more productively and improve their problem-solving skills.

Funding:
UNL Extension
User fees
Smith-Lever 3(b) & (c)

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Summary:
Childhood arguments are common even in child-care settings. Adults can simply solve the problem for children, but that doesn't teach kids to solve conflicts themselves. UNL Extension is teaching early childhood professionals a new, more effective way to settle squabbles. During conferences, participants learn conflict mediation skills and how to help preschoolers learn to resolve their own conflicts. Nearly 3,000 early childhood professionals, educators and foster parents have received education at nearly 20 conferences statewide in the past two years. Participants say the training gives them the knowledge to help children resolve conflicts more productively and improve their skills.

Society-Ready Graduates
Topic: Morrill Scholars

Issue:
To become effective leaders in the future, today's students need opportunities to explore and understand social, public and political leadership and responsibility along with their traditional classes.

What has been done:
In fall 2005, the College of Agricultural Sciences and Natural Resources at the University of Nebraska–Lincoln initiated the Justin Smith Morrill Scholars Program. It's named for the author of the Morrill Act of 1862, which established the land-grant university system and laid the foundation for U.S. public higher education. Nearly 50 freshmen expressed an interest in joining the program in fall 2005. The goal is to create a legacy of civic engagement by offering students a chance to explore leadership, political and social issues in and beyond the classroom, including courses related to culture, ethics and the land-grant system. Organizers hope Morrill Scholars will participate in field trips, including visiting the nation's capital and meeting congressional staff and leaders in agriculture and natural resources. Organizers expect it will become student-driven.

Impact:
Participating students will have a broader understanding of America's affordable public higher education system and what that means to the nation. Organizers expect participants to become "more sophisticated and cosmopolitan" as they learn about this legacy of civic leadership and responsibility, and be better prepared for civic leadership after graduation.

Funding:
UNL College of Agricultural Sciences and Natural Resources

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Summary:
UNL College of Agricultural Sciences and Natural Resources students are exploring the roots of the nation's land-grant system through a new program designed to broaden their perspective on civic and social engagement and leadership. In fall 2005, the college initiated the Justin Smith Morrill Scholars Program. It's named for the author of the Morrill Act of 1862 that established the land-grant university system and laid the foundation for U.S. public higher education. Nearly 50 freshmen expressed an interest in joining the program in fall 2005. The goal is to create a legacy of civic engagement by offering students a chance to explore leadership, political and social issues in and beyond the classroom, including courses related to culture, ethics and the land-grant system. Organizers expect the program will help participants become "more sophisticated and cosmopolitan" as they learn about this legacy of civic leadership and responsibility, and be better prepared for civic leadership after graduation.

Society-Ready Graduates
Topic: Nebraska Youth Beef Leadership Symposium

Issue:
To remain strong in the future, Nebraska agriculture and its beef industry need to attract talented, well-educated young people. And to become future leaders in agriculture, Nebraska students need a solid education, a good understanding of the beef business, leadership skills and an idea of the many career opportunities agriculture offers.

What has been done:
University of Nebraska–Lincoln animal science and agricultural leadership faculty teamed with the Nebraska Beef Council, Nebraska Cattlemen and producers, feeders, financial institutions and related industries to offer the Nebraska Youth Beef Leadership Symposium at UNL. Held annually since 2003, the three-day event lets students in high school and two-year colleges learn about the beef industry, career options and beef-related educational opportunities in the university's Institute of Agriculture and Natural Resources. They talk with faculty and beef industry leaders and build leadership skills. A business simulation called Beefville, in which participants take on characters and roles in a community, completes the symposium.

Impact:
The symposium strengthens students' knowledge about the beef industry, giving them a much clearer understanding of career and leadership opportunities in agriculture. Organizers say it is generating enthusiasm among students for ag-related careers. Participants say the symposium helps them better appreciate the importance of community and industry involvement. "If you want to make a difference you have to be involved," one participant said.

Funding:
UNL Department of Animal Science
UNL Department of Agricultural Leadership, Education and Communication
Nebraska Beef Council
Nebraska Cattlemen Research and Education Foundation
Nebraska Corn Board
Cargill Inc., Sweet Bran
Midwest PMS
Darr Feedlot
Wagonhammer Cattle Company
Elanco Animal Health

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Summary:
Young people are important to the future of Nebraska agriculture and the beef industry. UNL animal science and agricultural leadership faculty partner with the Nebraska Beef Council, Nebraska Cattlemen and others to offer the Nebraska Youth Beef Leadership Symposium. The annual three-day event gives junior and senior high school students and students at two-year colleges a chance to meet with leaders of the beef industry, learn more about the beef industry, and explore career opportunities in agriculture and UNL's beef-related educational offerings. The symposium is laying the groundwork for a new generation of Nebraska agricultural leaders. It is generating enthusiasm for ag-related careers and increasing students' awareness of leadership opportunities in agriculture. Participants say the symposium helps them better appreciate the importance of community and industry involvement.

Society-Ready Graduates
Topic: Teaching Beef Herd

Issue:
When it comes to understanding livestock production and marketing, nothing beats the real thing.

What has been done:
Animal science students in the University of Nebraska–Lincoln's College of Agricultural Sciences and Natural Resources get firsthand experience with cattle thanks to the department's teaching herd. The cattle are used in numerous classes to teach concepts such as anatomy, physiology and nutrition. The teaching herd also provides real-world experience for beef cattle merchandising students who manage UNL's bull sale each year. Cattle producers buy the teaching herd bulls for their own herds. The teaching herd debuted at the university in 1874. A variety of breeds once were common, but today Angus is the only purebred herd at UNL. In 1985, Husker Red and Husker Black crossbreds were developed based on Hereford, Red Angus, Gelbvieh and Simmental. Students also use the crossbred herd to practice calculating genetic estimates.

Impact:
The UNL teaching herd is a valuable learning tool that gives students hands-on experience and practical insights that better prepare them for careers in the beef industry. Students say the herds are critical to their education. "You can explain a concept up one side and down the other, but it just makes things easier to see them firsthand," one said. A student who helped organize the annual bull sale said: "There's no substitute for actually getting your hands dirty, finding out what it's really like and learning from it."

Funding:
UNL Department of Animal Science

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Summary:
Animal science students in UNL's College of Agricultural Sciences and Natural Resources get firsthand experience with cattle thanks to the department's teaching herd. These cattle are important teaching tools that are used in numerous classes to teach concepts such as anatomy, physiology and nutrition. The teaching herd also provides real-world experience for beef cattle merchandising students who manage UNL's bull sale each year. Students say the herd provides practical insights about real-life cattle situations and concepts and better prepares them to work in the beef industry. "You can explain a concept up one side and down the other, but it just makes things easier to see them firsthand," a student said. "Hands-on learning is the best kind of learning," another said.

Society-Ready Graduates
Topic: Professional Golf Management Major

Issue:
As Americans seek ways to relax and enjoy the outdoors, golf has become increasingly popular. There's growing demand for well-educated professionals in a variety of golf-related careers.

What has been done:
To educate University of Nebraska–Lincoln students to meet this demand, the College of Agricultural Sciences and Natural Resources launched a new Professional Golf Management major in 2003, which in 2004 was accredited by the Professional Golfers' Association of America. The college's strong science-based agriculture and horticulture course work provided a natural foundation for the new program. The rigorous major requires a strong background in biology, physical sciences and turf science, business management from the College of Business Administration, hospitality, food and nutrition from the College of Education and Human Sciences and 16 months of internships. At the end of the 4.5-year program, graduates enter careers such as golf facility management, events coordination, golf instruction, merchandising or the traditional career as a golf course professional. As of January 2006, 71 students were enrolled in this major with significant growth anticipated in the future.

Impact:
This new program is expanding opportunities for students to prepare for careers in this growing industry. UNL is one of only 17 universities nationwide to offer a PGA-accredited program. The program's rapid growth reflects student interest in this major, which is attracting students who would not traditionally enter the College of Agricultural Sciences and Natural Resources, including several from beyond Nebraska.

Funding:
UNL College of Agricultural Sciences and Natural Resources

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Summary:
UNL students are preparing for careers in the expanding golf industry, thanks to a new College of Agricultural Sciences and Natural Resources' major. Launched in 2003, the new Professional Golf Management major combines the strengths of CASNR's science-based courses with business offerings from the College of Business Administration, and hospitality and nutrition courses in the College of Education and Human Sciences. UNL's program is one of only 17 nationwide accredited by the Professional Golfers' Association of America. The popular new major is attracting students who would not traditionally enter the College of Agricultural Sciences and Natural Resources, many of whom are out-of-state students. In January 2006, 71 students were professional golf management majors. Enrollment is expected to grow significantly in the future. This new program prepares students for careers in this expanding industry, including careers in golf facility management, events coordination, golf instruction, merchandising or the traditional career as a golf course professional.

Society-Ready Graduates
Topic: Student Development Initiative Promotes Leadership

Issue:
Freshmen often don't get many opportunities to participate in leadership and character-building activities, yet such involvement boosts chances a student will stay in college and do well.

What has been done:
Since 2002, the University of Nebraska–Lincoln's College of Agricultural Sciences and Natural Resources has offered the Dean's Scholars for Experiential Leadership, or DSEL, program to involve freshman students in leadership and character-building activities. During the 2005-06 school year, 37 students were enrolled. DSEL participants hear speakers, participate in forums about campus events and are encouraged to get involved in clubs and scholastic activities. One of the program's aims is to make students more comfortable with and confident to lead change. DSEL students also partnered with second-graders from a nearby school in a pen pal program.

Impact:
Organizers say DSEL participants seek and assume leadership roles earlier in their college experience. They have more confidence in leadership positions and situations; seek leadership roles beyond their traditional academic clubs, including roles outside of the university; and feel more comfortable approaching faculty and administrators with questions and concerns. One participant said: "(I'm) not so afraid of my future and greatly more independent and responsible for my own actions." Another said: "I think I have a better perspective on how to balance school, work, clubs and activities and social time." The community also benefits. The pen pals effort provided winter clothing for about 40 needy children.

Funding:
UNL College of Agricultural Sciences and Natural Resources

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Summary:
Freshmen are gaining confidence and honing their decision-making and leadership skills through a UNL College of Agricultural Sciences and Natural Resources' program. Students say that after participating in the Dean's Scholars in Experiential Leadership program, they feel more confident, are better able to manage their time, and feel better able to take on challenges and opportunities that will benefit their careers and their lives. During the 2005-06 school year, 37 students participated. The community also benefits. DSEL students partnered with second-graders from a nearby school in a pen pal program that also provided winter clothing to 40 needy children.

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