2008 University of Nebraska Combined Research and Extension Annual Report of Accomplishments and Results

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I. Report Overview

1. Executive Summary

Since 1988, the University of Nebraska-Lincoln Institute of Agriculture and Natural Resources (IANR) has followed a carefully developed and regularly revised strategic plan that sets the Institute's direction based upon clientele needs. The 2000-2008 Strategic Plan reflected the changes in Nebraska's agriculture, agribusiness, natural resources and human resources occurring across the state. As needs changed, IANR reassessed and updated the strategic plan's priorities to meet those needs. Not only have the issues diversified but also the delivery tools used to distribute educational programs. Use of the internet and the demand for 24/7 access to education have changed how the faculty of the IANR deliver educational programs. 2008 also saw subtle, but nevertheless, signs of economic stress in our communities. While agriculture was viable and continued to lead Nebraska's economic incomes in a very positive way in 2008 there were downturns in other parts of the economy.

Throughout the years of this strategic plan, IANR solicited input at listening sessions held at statewide sites representing the breadth of IANR constituents. These listening sessions were held in 2008 in Omaha (metropolitan area), South Sioux City (metropolitan area) and Valentine (rural area). Persons of varied occupations and ages, provided input as to the issues impacting their lives. The themes heard remained similar to past years of water (drinking and quality), economics, strong family units, agricultural products of the future, and entrepreneurship. With this input, as well as with input of commodity, advisory, and advocacy groups the three themes of IANR were retained. Those themes are:

- A quality environment and effective natural resource management
- Sustainable and economically viable food and biomass systems
- Viable communities and appropriate quality of life for individuals and families

These themes were utilized by all mission areas of the IANR (extension, research, teaching). The integration of programmatic goals across division lines is referred to by IANR as program balance. Balance is the integration of goals and outcomes across research, teaching and extension rather than in programmatic silos. It is this programmatic balance that has led IANR since its inception and continues to provide guidance to all three land grant missions within the Institute. Additionally each of the three themes emphasizes student programs, i.e., recruitment; and extended education through making available both formal and non formal learning through interactive electronic such as the web or Adobe Connect programs.

During 2008 the downturn in the economy led to the development of a widely publicized and utilized website, Managing in Tough Times, http://toughtimes.unl.edu. It was the input of stakeholders, legislators, and family businesses that led to the development of this website. This represents a response to the basic of needs of our constituents. It also allows a way to tout the outcomes of extension and research programmatic efforts for to those in need of this research based, educational information.

Total Actual Amount of professional FTEs/SYs for this State

Year:2008	**Extension**		**Research**	
	1862	**1890**	**1862**	**1890**
Plan	212.0	0.0	131.0	0.0
Actual	202.0	0.0	136.0	0.0

II. Merit Review Process

1. The Merit Review Process that was Employed for this year

- Internal University Panel
- External Non-University Panel
- Combined External and Internal University Panel
- Combined External and Internal University External Non-University Panel

2. Brief Explanation

The program descriptions included in this annual report reflect major focus areas identified in the IANR Strategic Plan. These focus areas reflect our citizens' review of critical issues as shown by input of stakeholders, faculty and administrators.

The faculty teams within each of the five Extension action plans (which contribute to the outcomes of the IANR Strategic Plan) annually update their plans using stakeholder input and evaluation results from delivered educational programs. Also, every faculty member with a research appointment in the Agricultural Research Division (ARD) must have a current approved peer reviewed project that defines his or her area of research investigation. The peer review process is consistent with the Hatch Act requirements as amended for agricultural experiment station projects and is required for all projects, whether classified as Hatch, State, or Multi state. This peer review process includes the Unit/Research and Extension head, one member of the faculty with relevant expertise, and the Associate Dean of ARD. Following review and acceptable revision, if necessary, the project outline is forwarded to USDA CSREES for inclusion in the CRIS database.

Another review process, used within IANR combines merit and peer review, and is the annual review by state commodity check off boards of more than 100 research and extension funding proposals submitted by Extension and ARD faculty. Proposals selected for funding address the most significant problems currently facing the producer members of these boards and clearly communicate the research's relevance to user needs. This review process provides additional valuable input to the extension and ARD planning efforts.

Department and Research/Extension Center comprehensive five year reviews provide another information source to ensure program quality and relevance. Teams comprised of three to six external panel members and approximately two internal panel members from other departments conduct these reviews, which ensure that the programs provided focus on Nebraskans' most pressing needs.

III. Stakeholder Input

1. Actions taken to seek stakeholder input that encouraged their participation

- Use of media to announce public meetings and listening sessions
- Targeted invitation to traditional stakeholder groups
- Targeted invitation to non-traditional stakeholder groups
- Targeted invitation to traditional stakeholder individuals
- Targeted invitation to non-traditional stakeholder individuals
- Targeted invitation to selected individuals from general public
- Survey of traditional stakeholder individuals
- Survey of the general public

Brief Explanation

The University of Nebraska–Lincoln Extension and Agricultural Research Division have collaborated to deliver programs for over 10 years. Stakeholder input processes conducted by UNL Extension impact ARD planning and vice versa.

Hundreds of individuals are involved annually in the identification of program issues pertinent to the delivery of education through Nebraska's land grant university. Following are examples of the multitude of ways that input were sought this year from Nebraska residents, both metropolitan and non metropolitan.

Stakeholder listening session feedback is shared with the Extension action plan teams. The five UNL Extension action plan teams also received program input from their key clientele annually. (Each stakeholder represented a significant population, organization or was a key political leader.) Teams obtained stakeholder input in a variety of ways including face to face meetings and telephone or written surveys. In addition, a number of advisory committees associated with University of Nebraska academic departments and research and extension centers provided excellent input to both our extension programming and the Agricultural Research Division's research projects.

Throughout the process of garnering stakeholder input, special efforts were made to include non traditional groups and individuals into the discussions. For example targeted invitations were made to representatives from under represented populations. Traditional individual stakeholders are asked to bring non traditional stakeholders to listening sessions. They are also asked to help identify non traditional stakeholder groups that can be invited to participate. Separate listening sessions were held with under represented populations.

In 2007, Extension boards statewide were involved in a series of Appreciative Inquiry efforts. It was found that the issues identified by clientele to Extension board members (split about 50/50 between those who used and did not use Extension programs) were consistent with those identified over time by key stakeholders. This effort in 2008-2009 will pair extension board members with Nebraska residents to again seek further clarification of clientele needs.

2(A). A brief statement of the process that was used by the recipient institution to identify individuals and groups stakeholders and to collect input from them

1. Method to identify individuals and groups

- Use Advisory Committees
- Use External Focus Groups

Brief Explanation

Several methods were used to identify individuals and groups to provide programming process input. Because they have the closest association with their subject area, extension action teams were responsible for identifying stakeholders familiar with their area of programming and related issues impacting state residents. These action teams also kept abreast of Nebraska’s changing demographic trends and included those audiences who might be underserved through our traditional programming.

Most IANR departments, research and extension centers, interdisciplinary centers and programs have external advisory groups representing stakeholders and users. These groups meet at least annually and provide input on current and future programs. Members of these groups are consistently asked to gain additional local input from individuals and groups in their communities. Special efforts were made to ensure that input from non users and under represented populations are included in the discussions.

2(B). A brief statement of the process that was used by the recipient institution to identify individuals and groups who are stakeholders and to collect input from them

1. Methods for collecting Stakeholder Input

- Meeting with traditional Stakeholder groups
- Meeting with traditional Stakeholder individuals
- Survey of traditional Stakeholder individuals
- Meeting specifically with non-traditional individuals
- Survey specifically with non-traditional individuals
- Meeting with invited selected individuals from the general public

Brief Explanation

Collecting accurate stakeholder input which reflects the needs of the state is an important part of University of Nebraska –Lincoln Extension and Agricultural Research Division programming. Hence, a variety of methods for data collection are used.

Action teams hold meetings with stakeholders to gain their input. Researchers meet with constituents and experts from other agencies to assess current needs. Representatives from commodity groups, the green industry and related industrial entities participate in the IANR department advisory committees. These advisory groups provide departmental and extension/research programmatic goal input. For each IANR listening session, the host extension educators were asked to invited key community stakeholders. In addition, many of the listening sessions issued a general invitation to the public.

Additional stakeholder input is sought from targeted audiences. For example the 4 H Youth Development team surveyed non English speaking and high risk youth in inner city Omaha to determine what kinds of educational programs related to career development would best fit their needs. Input was sought from school districts, and first generation U.S. families on needs of families assimilating into Nebraska communities.

While stakeholder input from clients is vital to program and research success, on going communication among experts is also critical. UNL Extension and academic departments compare action plans to insure congruence. This happens through group discussions between departmental and extension/research administrators and departmental administrative attendance as a part of the extension action plan team meetings. Action team planning included research/extension faculty and department heads. In addition, on going dialogue among action team members and departmental faculty create unified programming efforts that meet needs identified by stakeholders.

In addition to the above methods, several action plan teams held regular meetings through telephone or face to face meetings.

3. A statement of how the input was considered

- In the Budget Process
- To Identify Emerging Issues
- Redirect Extension Programs
- Redirect Research Programs
- In the Staff Hiring Process
- In the Action Plans
- To Set Priorities

Brief Explanation

UNL Extension and Agricultural Research Division concur that in addition to collecting stakeholder input, it must also be used to develop on target education and research programs. Hence, this input was used for: the on going visioning of action teams, making decisions as to budget allocations and hiring of new staff, re directing and creating new programming, and setting priorities for the system.

For example, because of stakeholder input related to the need to do better marketing, UNL Extension works with an outside marketing firm to develop tools and messages that will be delivered statewide. Because of stakeholder input, energy management includes wind energy. Water continues to be a top priority for Extension and research based on on going conversations with stakeholder groups and individuals, hence a targeted water programming web site (http://water.unl.edu/) locates in one place water related information.

Through stakeholder involvement: UNL Extension programs are better marketed across the state. Program co-sponsorships become more likely as others learn about programs. Collaborating entities become program participants. Collaborating entities become sources of matching funds to deliver educational programs.

Brief Explanation of what you learned from your Stakeholders

Meetings and reports submitted by the extension action plan teams and research advisory committees indicated that while stakeholders generally saw their goals as in alignment with Nebraskans' needs, modifications were made to insure that the plan of work goals were positioned to have extension/research partner with other educational entities. The general tone of stakeholder reviewers has been that the action plan teams' educational goals focus on high priority issues. Encouragement from stakeholders to not duplicate, but partner with other educational entities, remains a key item, as does the need to market and promote educational efforts undertaken. Additional themes that remain consistent are: UNL Extension needs to be able to respond more rapidly. Bring other partners to the table for planning and implementation. Become better acquainted with other entities delivering education in various program areas. Continue to use technology for program delivery. Focus on programs most critical—tighten focus—eliminate duplication. In 2008 the subtle messages of slow down in the economy was key to the development of the web site, Managing in Tough Times and agricultural programs on high input costs to feeding livestock.

IV. Expenditure Summary

1. Total Actual Formula dollars Allocated (prepopulated from C-REEMS)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
4479198	0	3478226	0

2. Totaled Actual dollars from Planned Programs Inputs

	Extension		Research	
	Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
Actual Formula	4593033	0	5644599	0
Actual Matching	4479198	0	3563619	0
Actual All Other	43094002	0	72797872	0
Total Actual Expended	52166233	0	82006090	0

3. Amount of Above Actual Formula Dollars Expended which comes from Carryover funds from previous years

Carryover	562900	0	2652088	0

V. Planned Program Table of Content

Program #1

V(A). Planned Program (Summary)

1. Name of the Planned Program

Sustainable and Economically Viable Food and Biomass Systems

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
201	Plant Genome, Genetics, and Genetic Mechanisms	4%		11%	
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants	4%		6%	
205	Plant Management Systems	11%		9%	
206	Basic Plant Biology	6%		7%	
211	Insects, Mites, and Other Arthropods Affecting Plants	5%		8%	
212	Pathogens and Nematodes Affecting Plants	4%		6%	
213	Weeds Affecting Plants	4%		3%	
215	Biological Control of Pests Affecting Plants	2%		3%	
216	Integrated Pest Management Systems	5%		5%	
301	Reproductive Performance of Animals	8%		6%	
302	Nutrient Utilization in Animals	5%		7%	
305	Animal Physiological Processes	2%		4%	
307	Animal Management Systems	4%		4%	
315	Animal Welfare/Well-Being and Protection	11%		4%	
402	Engineering Systems and Equipment	6%		4%	
501	New and Improved Food Processing Technologies	5%		5%	
511	New and Improved Non-Food Products and Processes	3%		4%	
601	Economics of Agricultural Production and Farm Management	8%		2%	
606	International Trade and Development	2%		1%	
901	Program and Project Design, and Statistics	1%		1%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2008	**Extension**		**Research**	
	1862	**1890**	**1862**	**1890**
Plan	116.0	0.0	83.0	0.0
Actual	78.0	0.0	86.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	**1890 Extension**	**Hatch**	**Evans-Allen**
1897056	0	4065998	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
1925205	0	2369509	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
18156121	0	50877511	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

- Conduct research and extension programs to develop/deliver new and improved crop and livestock integrated management programs.
- Conduct research and extension programs to develop/deliver new and improved information to help producers create sustainable crop and livestock production programs.
- Conduct research and extension programs to develop/deliver new and improved information to identify new and emerging markets and marketing strategies for agricultural products and agribusiness.
- Conduct research and extension programs to develop/deliver information on new or improved food products and technologies and emerging efficiencies of production to Nebraska's ag-based industries.

Because this planned program covers more than 20 knowledge areas, each knowledge area listed may represent additional areas as indicated below:

201, 203, 205 (202, 204), 206, 216 (214), 211, 212, 213, 215,302, 307, 301 (303, 304, 306, 308), 305, 315 (311, 312, 313, 314), 402 (401, 404), 501 (502,503,504), 511 (512), 601 (602, 603, 604), 606 (609, 610, 611), 901 (902, 903)

2. Brief description of the target audience

Targeted audiences will include a broad range of small and large agricultural producers and processors.Nebraska-based processors, especially start-up companies, will receive high priority. Specific groups that will use the research and education programs include:
Crop and livestock producers
State agribusiness
Food processing facilities
Natural Resource Districts
Research and extension specialists
Extension educators
Commodity groups
Nebraska independent crop consultants
Seed fertilizer and pesticide suppliers
Commercial pesticide applicators
Certified crop advisors
Neighboring state institutions
Scientists and engineers developing new knowledge

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	37100	300000	750	2000
2008	40011	80000	3572	7200

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year	Target
Plan:	2
2008 :	5

Patents listed

DK/EP 0840554, IP-339
EU 96921364.4, IP-340
Ireland 93921364.4, IP-343
Norway 20033811, IP-336
US 7,371,571, IP-474

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	45	175	
2008	51	361	412

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of scholarly publications and ouputs related to economically viable and sustainable food and biomass systems.

Year	Target	Actual
2008	220	412

Output #2

Output Measure

- Number of workshops, continuing education programs, web-based curricula and field days/tours related to economically viable and sustainable food and biomass systems.

Year	Target	Actual
2008	445	559

Output #3

Output Measure

- Number of Agricultural Research Division projects related to economically viable and sustainable food and biomass systems.

Year	Target	Actual
2008	190	120

Output #4

Output Measure

- Number of new extension publications and other education resources related to economically viable and sustainable food and biomass systems.

Year	Target	Actual
2008	35	51

Output #5

Output Measure

- Number of new or improved plant and animal genetic materials or resources related to economically viable and sustainable food and biomass systems.

Year	Target	Actual
2008	25	18

Output #6

Output Measure

- Number of new products and decsion tools developed and made available to clientele related to economically viable and sustainable food and biomass systems.

Year	Target	Actual
2008	10	11

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	OUTCOME NAME
1	Nebraska farmers will increase profitability through adoption of research and extension information provided by IANR programs (measured by value placed on the information by clientele).
2	Nebraska ranchers and feeders will increase profitability through adoption of research and extension information provided by IANR programs (measured by value placed on the information by clientele).
3	Nebraska farmers and ranchers will have sustainable food and biomass systems through adoption of best management practices (measured by percent of clientele adopting best management practices).
4	Nebraska will have access to a highly trained and educated workforce for economically viable and sustainable food and biomass systems (indirectly measured by number of undergraduate and graduate students receiving degrees).
5	Nebraska farmers will rely on IANR research and extention programs to assure an economically viable and sustainable food and biomass system (measured by percent of state acreage represented at education programs).

Outcome #1

1. Outcome Measures

Nebraska farmers will increase profitability through adoption of research and extension information provided by IANR programs (measured by value placed on the information by clientele).

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	133400000	151358712

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

To remain economically viable and environmentally sustainable in a rapidly changing world, Nebraska farmers and related agribusiness representatives must obtain and incorporate new research-based knowledge as quickly as possible in order to gain efficiencies, be better stewards of our natural resources, and take advantage of new opportunities.

What has been done

In 2008, IANR program impact reports indicated over 14,500 farmers, agricultural consultants, and other agri-business professionals, representing over 16.5 million acres of the state's field crops participated in (or electronically accessed) information from over 450 workshops, continuing education programs, web-based curricula and field days/tours, etc. to gain new research based information to be more profitable and develop more sustainable farms and agricultural related businesses.

Results

Clientele attending IANR sponsored events or accessing IANR generated web-based materials self-assessed the value of the information in potential increased profits or loss mitigation at an average value of over $150 million. Selected impacts include: Our 'Winning the Game Marketing Program' demonstrated how corn and soybean producers could increase their income 15 and 18 cents a bu for corn and soybeans, respectively; the 512 participants indicated they would increase their income $16,000 each. Nebraska Soybean Nematode Field Day participants, representing over 86,400 soybean acres, estimated their increase in awareness would save them $28.53 per acre or nearly $2.5 million. Crop Management and Diagnostic Clinics impacted 57% of Nebraska's row crop acres through 13 workshops in 2008; the over 800 participants influence or manage over 7.1 million acres; participants estimated that the estimated value of changes they planned on their acres was $8.67/acre, or a total of over $65 million.

4. Associated Knowledge Areas

KA Code	Knowledge Area
211	Insects, Mites, and Other Arthropods Affecting Plants
216	Integrated Pest Management Systems
213	Weeds Affecting Plants
601	Economics of Agricultural Production and Farm Management
215	Biological Control of Pests Affecting Plants
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants
606	International Trade and Development
201	Plant Genome, Genetics, and Genetic Mechanisms
206	Basic Plant Biology
901	Program and Project Design, and Statistics
212	Pathogens and Nematodes Affecting Plants
205	Plant Management Systems

Outcome #2

1. Outcome Measures

Nebraska ranchers and feeders will increase profitability through adoption of research and extension information provided by IANR programs (measured by value placed on the information by clientele).

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	81262000	58186000

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

To remain economically viable and environmentally compatible in a rapidly changing world, Nebraska ranchers and feeders and related agribusiness representatives must obtain and incorporated new research based knowledge as quickly as possible in order to gain efficiencies, be better stewards of our natural resources, and take advantage of new opportunities.

What has been done

In 2008, IANR program impact reports indicated over 4,500 (plus over 50,000 online) ranchers, feeders, and related agri business professionals, representing over 4.1 million acres of range, hay, and crop land, and over 4.7 million head of cattle participated in 152 workshops, field days, tours, etc. to gain new research based information to be more profitable and develop more sustainable ranch, feeding, and related agricultural business operations.

Results

Clientele surveys valued the information provided at $12.38/head, averaged across all livestock related impact reports. Total value of these educational activities was over $58 million. Selected impacts include: Eleven UNL extension programs were offered to transfer research knowledge to cattle producers about the feeding and storing the abundant co-products produced by Nebraska's ethanol industry; 440 producers representing 62,903 head of cattle reported a savings of $12.88 per head based on their knowledge gained. In a related program, an additional 238 beef producers and related industry professionals improved their understanding of feeding ethanol plant by products. An increase in income of $4.48 per head was reported by attendees who impact the management of 1,744,100 head of cattle. Beef profitability seminars were conducted that provide a basis for considering a balance of management variables, including range and breeding management, feed supplementation and marketing. These professionals managed nearly 7,000 head and the 92 producers estimated the value of attendance at $15/head.

4. Associated Knowledge Areas

KA Code	Knowledge Area
606	International Trade and Development
901	Program and Project Design, and Statistics
601	Economics of Agricultural Production and Farm Management
216	Integrated Pest Management Systems
302	Nutrient Utilization in Animals
301	Reproductive Performance of Animals
402	Engineering Systems and Equipment
305	Animal Physiological Processes
307	Animal Management Systems
315	Animal Welfare/Well-Being and Protection

Outcome #3

1. Outcome Measures

Nebraska farmers and ranchers will have sustainable food and biomass systems through adoption of best management practices (measured by percent of clientele adopting best management practices).

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	70	78

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

To remain economically viable and environmentally compatible in a rapidly changing world, Nebraska farmers, ranchers, and related agribusiness representatives must obtain and incorporated new research based knowledge as quickly as possible. Clientele expressed intent to implement changes based on the new information presented at UNL sponsored events is a strong indication that the information presented was timely and of value to the agricultural industry.

What has been done

Participant surveys from workshops, field days, tours, clinics, and electronically delivered offerings included a variety of quantitative economic and behavioral change questions. Over 17,100 farmers, ranchers, feedlot, and related agribusiness professionals participated in the over 500 workshops and educational offerings; they represented over 16 million acres of Nebraska crops and 4 million head of cattle.

Results

The surveys indicated that over 78% of clientele participating in University of Nebraska sponsored workshops, field days, tours and electronically delivered events definitely would or probably would make changes as a result of the new research based information presented. The participants attending the events represented approximately 85% of the crop acres and 68% of the cattle in the state. These results indicate the information provides economic value to the producers in the state, with over 78% using the information to make or consider changes in their operations. The information influences decisions on 68 - 85% of the state's agricultural production.

4. Associated Knowledge Areas

KA Code	Knowledge Area
211	Insects, Mites, and Other Arthropods Affecting Plants
215	Biological Control of Pests Affecting Plants
212	Pathogens and Nematodes Affecting Plants
205	Plant Management Systems
307	Animal Management Systems
216	Integrated Pest Management Systems
213	Weeds Affecting Plants
601	Economics of Agricultural Production and Farm Management

Outcome #4

1. Outcome Measures

Nebraska will have access to a highly trained and educated workforce for economically viable and sustainable food and biomass systems (indirectly measured by number of undergraduate and graduate students receiving degrees).

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	100	414

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

To remain economically viable and environmentally compatible in a rapidly changing world, Nebraska farmers and related agribusiness representatives must have access to a highly educated and trained work force in order to take advantage of new information, incorporate new technologies, and adjust to changing economic, social, and environmental conditions.

What has been done

The University of Nebraska offers 27 undergraduate programs of study and two pre-professional programs in agriculture and natural resources, and 15 Master of Science and 12 Ph.D. programs. Our programs include agribusiness, animal science, agronomy, biochemistry, biological systems engineering, fisheries and wildlife, food science and technology, pre-veterinary medicine, professional golf management, etc.

Results

In 2008, there were 288 Baccalaureate and 126 Masters/Doctoral degrees conferred at the University of Nebraska in agricultural and natural resources related areas. Over 85% of our Baccalaureate degree students find jobs in their fields or continue with their professional education; approximately 70% take their first job in Nebraska.

4. Associated Knowledge Areas

KA Code	Knowledge Area
601	Economics of Agricultural Production and Farm Management
216	Integrated Pest Management Systems
206	Basic Plant Biology
305	Animal Physiological Processes
606	International Trade and Development
213	Weeds Affecting Plants
211	Insects, Mites, and Other Arthropods Affecting Plants
301	Reproductive Performance of Animals
302	Nutrient Utilization in Animals
901	Program and Project Design, and Statistics
205	Plant Management Systems
315	Animal Welfare/Well-Being and Protection
307	Animal Management Systems
212	Pathogens and Nematodes Affecting Plants
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants
201	Plant Genome, Genetics, and Genetic Mechanisms
501	New and Improved Food Processing Technologies
402	Engineering Systems and Equipment
511	New and Improved Non-Food Products and Processes
215	Biological Control of Pests Affecting Plants

Outcome #5

1. Outcome Measures

Nebraska farmers will rely on IANR research and extention programs to assure an economically viable and sustainable food and biomass system (measured by percent of state acreage represented at education programs).

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	64	75

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

To remain economically viable and environmentally compatible in a rapidly changing world, Nebraska farmers, ranchers, and related agribusiness representatives must obtain and incorporated new research based knowledge as quickly as possible. For the University of Nebraska to effectively serve the needs of our clientele, our education efforts must reach a significant portion of the farming, ranching, and related agribusiness industry in the state.

What has been done

Participant surveys from workshops, field days, tours, clinics, and electronically delivered offerings included a variety of quantitative economic and behavioral change questions. Over 17,100 farmers, ranchers, feedlot, and related agribusiness professionals participated in the over 500 workshops and educational offerings; they represented over 16 million acres of Nebraska crops and 4 million head of cattle.

Results

The surveys indicated that over 78% of clientele participating in University of Nebraska sponsored workshops, field days, tours and electronically delivered events definitely would or probably would make changes as a result of the new research based information presented. The participants attending the events represented approximately 85% of the crop acres and 68% of the cattle in the state. These results indicate the information provides economic value to the producers in the state, with over 78% using the information to make or consider changes in their operations. The information influences decisions on 68 - 85% of the state's agricultural production.

4. Associated Knowledge Areas

KA Code	Knowledge Area
215	Biological Control of Pests Affecting Plants
213	Weeds Affecting Plants
307	Animal Management Systems
216	Integrated Pest Management Systems
212	Pathogens and Nematodes Affecting Plants
211	Insects, Mites, and Other Arthropods Affecting Plants
205	Plant Management Systems
601	Economics of Agricultural Production and Farm Management

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought,weather extremes,etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities

Brief Explanation

Natural disasters and Economic Factors: Drought conditions subsided in 2008, with the exception of western Panhandle. This has eased some of the concerns with water availability, but with the downward change in crop prices and a dampened demand for meat products, there is significant emphasis on achieving efficiencies in management practices. The development of the ethanol industry has brought significant economic development and income potential to many rural areas, and offered new feeding opportunities for cattle producers that impact cattle nutrition. Public policy and Government Regulations: Public pressure by the Human Society of the US is causing significant concerns among all agricultural organizations. Policy implementation in California and other states sponsored by HSUS is seen as promoting economically unsustainable agricultural practices in the US by agricultural organizations. In addition, the ethanol industry continues to face pricing challenges and continued questions regarding its economic feasibility, relative environmental benefit, and energy conversion efficiency. As grain-based ethanol production is increasingly linked with cattle feeding systems, research into 2nd generation bio-fuels and hybrid grain/cellulosic ethanol systems that still maintain an economically viable cattle industry is essential for Nebraska. Public Priorities: Reduced state tax collection is likely to lead to a smaller university budget over the next two years. This will likely cause a shift towards less-applied research activities, and realignment of extension programming.

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- After Only (post program)
- Before-After (before and after program)
- During (during program)

Evaluation Results

The Food Production and Natural Resources program has released statewide evaluation tools targeting clientele outcomes identified in the statewide action plan. These tools will allow statewide measure of program impact. Tools were release January 6, 2009 for crop production, livestock production, natural resources, and food safety. These tools will target educational program evaluation and provide a means of estimating knowledge gain, intended practice change, and likely conditional changes. The team leaders are beginning discussion of a post educational program tool to identify actual behavior and condition changes. Currently, program impacts are defined for individual events or initiatives. One example is the Solution Days field day which is a joint program of University of Nebraska and Syngenta. In 2008, 443 participants, who farm or manage 529,000 acres, attended a one-day clinic. The clinic was valued at $13 per acre (about $6,800,000 total value) by the participants. As a result of attending the clinics: 54% probably will and 32% definitely will improve management of soybean row spacing, plant population, and planting date; 62% probably will and 19% definitely will improve nutrient management of soybeans; 61% probably will and 24% definitely will improve management of emerging diseases, insects and weeds and 61% probably will and 23% definitely will improve management of price and financial decisions.

Key Items of Evaluation

Impact indicators and supporting statewide survey tools have been developed for knowledge gain, behavior change and conditional changes for the following outcomes for Livestock Systems:
Improve competitiveness and profitability of producers involved in the livestock industry.
Improve producer understanding and implementation of principles of environmental stewardship.
Increase Nebraska livestock producers' understanding of the advantages and disadvantages of value-based marketing of livestock and their products.
Enhance relationships between livestock industry and citizens of Nebraska.
Enhance livestock biosecurity and improve food safety of livestock products.
Similar resources for Cropping Systems address these outcomes:
Increase use of efficient, integrated cropping systems.
Adoption of improved plant genetic material and consideration of alternative crops by producers.
Improved marketing opportunities for Nebraska commodities and products for increased profit and income stability.
Improved resource stewardship in Nebraska cropping systems with respect to soil, water, air, and living resources.
Producers and agribusinesses will have improved capability to address biosecurity and bioterroism threats.

Program #2

V(A). Planned Program (Summary)

1. Name of the Planned Program

A quality Environment and Effective Natural Resource Management

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
101	Appraisal of Soil Resources	2%		3%	
102	Soil, Plant, Water, Nutrient Relationships	23%		15%	
111	Conservation and Efficient Use of Water	11%		17%	
112	Watershed Protection and Management	12%		12%	
121	Management of Range Resources	10%		8%	
122	Management and Control of Forest and Range Fires	1%		1%	
123	Management and Sustainability of Forest Resources	1%		1%	
124	Urban Forestry	1%		1%	
125	Agroforestry	1%		1%	
131	Alternative Uses of Land	1%		2%	
132	Weather and Climate	9%		10%	
133	Pollution Prevention and Mitigation	12%		12%	
134	Outdoor Recreation	1%		0%	
135	Aquatic and Terrestrial Wildlife	7%		8%	
141	Air Resource Protection and Management	1%		1%	
403	Waste Disposal, Recycling, and Reuse	3%		1%	
405	Drainage and Irrigation Systems and Facilities	2%		3%	
605	Natural Resource and Environmental Economics	2%		4%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2008	Extension		Research	
	1862	1890	1862	1890
Plan	47.0	0.0	34.0	0.0
Actual	44.0	0.0	35.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	**1890 Extension**	**Hatch**	**Evans-Allen**
745617	0	941675	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
607874	0	763654	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
6429217	0	13481905	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

IANR will conduct research and deliver extension education programs that will enable Nebraska agricultural water users to use water in ways that maximize efficiency and profitability, protect water quality and meet regulatory requirements. Key elements of this effort include:

- Development of an improved understanding of basic plant, water, soil and climate relationships.
- Evaluation of alternative water delivery systems including sprinkler irrigation technologies and sub-surface drip irrigation systems.
- Evaluation of alternative irrigation water management strategies for all irrigation system types and particularly for situations where deficit irrigation is necessary.
- Development of adapted crop varieties, using either conventional breeding programs or genetic modification, that are more drought tolerant, perform well in deficit irrigation situations or require less evapotranspiration for profitable production.
- Evaluate alternative crops that require less applied irrigation water or are adapted to non-irrigated production, that will fit into Nebraska cropping systems and for which a market exists.
- Evaluate opportunities for shifting from irrigated to non-irrigated production or other enterprises that will maintain producer and community economic viability and sustainability.
- Develop decision-making support systems that enable producers, policy makers, financial institutions and others to make critical decisions regarding crop production and water resources use.
- Enhance research and extension education programs that will increase the scientific knowledge base and public understanding of the occurrence, movement and quality of ground water; factors that impact the quantity and quality of surface water; the interrelationships between ground water and surface water; and the ecology of Nebraska’s ground water and surface water systems.
- Develop research and extension education programs that analyze the water resource and economic impacts of existing or proposed public policies.
- Enhance research and extension education programs that enable Nebraskans to protect ground water and surface water quality and respond to regulatory requirements.
- Enhance research and extension education programs that will enable communities and individuals to better understand and use appropriate technologies to protect the quality of drinking water supplies and to remove contaminants when drinking water standards are exceeded.
- Research-based information will be provided for individuals, groups and decision makers that will enable informed decisions relative to use of limited water supplies and protection of water quality.

Because this planned program covers more than 20 knowledge areas, each knowledge area listed may represent additional areas as indicated below:

101, 102 (104), 111, 112 (203, 205, 211, 213, 215, 216), 121, 122, 123, 124, 125, 131, 132, 133 (203, 205, 211, 213, 215, 216, 723), 134, 135 (136), 141 (722), 403 (722), 405 (404), 605

2. Brief description of the target audience

Nebraska farmers and ranchers, along with landowners, are the primary target audience for this work. In addition, target audiences will include land managers, bankers, agricultural consultants and agribusiness professionals who provide products and services to farmers and ranchers. The program's research and education efforts will provide valuable information for state and local policy makers (especially Natural Resource District Boards of Directors) as their make decisions regarding natural resources issues. The program will provide agency staff with the knowledge they need to carry out the agency responsibilities and mandates.

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	10000	20000	8000	20000
2008	22400	44800	8500	25000

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year	Target
Plan:	1
2008 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	15	35	
2008	52	194	246

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Scholarly publications and outputs related to water management and water quality.

Year	Target	Actual
2008	50	51

Output #2

Output Measure

- Number of water management and water quality education workshops/presentations, continuing eudcation programs, web-based curricula and field days/tours.

Year	Target	Actual
2008	150	210

Output #3

Output Measure

- Number of Agricultural Research Division projects that include water management and water quality as a key component.

Year	Target	Actual
2008	50	49

Output #4

Output Measure

- Number of new extension publications and other education resources developed.

Year	Target	Actual
2008	20	25

Output #5

Output Measure

- Number of scholarly publications and outputs addressing environmental and natural resources issues other than water management and water quality.

Year	Target	Actual
2008	30	143

Output #6

Output Measure

- Number of Agricultural Research Division projects that address environment and natural resource issues other than water management and quality.

Year	Target	Actual
2008	30	317

Output #7

Output Measure

- Number of education workshops/presentations, continuing education programs, web-based curricula and field days/tours that address environment and natural resource issues other than water management and quality.

Year	Target	Actual
2008	40	51

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	OUTCOME NAME
1	Irrigators will gain new knowledge and awareness of water conservation practices, crop water use rates, limited irrigation, irrigation scheduling and new irrigation technologies.
2	Nebraska farmers, ranchers, businesses and home owners will adopt new practices that will improve water management and protect water quality. This will be measured as the percentage of education program participants who indicate that they have adopted or plan to adopt new practices.
3	Livestock producers will continue to gain knowledge and awareness of appropriate practices to manage livestock manure.
4	Livestock producers will develop comprehensive nutrient management plans (CNMPs) and use best management practices for livestock manure handling and storage.
5	Nebraska farmers will increase their knowledge and awareness of how integrated pest management and pesticide best management practices can help protect water quality.
6	Nebraskans will gain increased awareness and knowledge of natural resources including wildlife, forest resources and rangeland and the relationship between natural resources stewardship, sustainability, economic viability and the environment.
7	Consumptive water use by irrigated crops will be reduced. The outcome measure will be the percent reduction of estimated consumptive water use when the current year is compared to the estimated consumptive water use in calendar year 2006. The consumptive water use will be estimated using the irrigation water pumped in Natural Resources Districts that require the use of water measurement devices.
8	Nebraska will not exceed its allocation of water in the Republican River as allowed by the interstate compact with Kansas and Colorado. Nebraska's allocation is 49% of the average annual water supply. The output measure will be the percent of the Republican River average annual water supply used by Nebraska.

Outcome #1

1. Outcome Measures

Irrigators will gain new knowledge and awareness of water conservation practices, crop water use rates, limited irrigation, irrigation scheduling and new irrigation technologies.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	1000	2686

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

According to the USDA 2003 Farm and Ranch Irrigation Survey, Nebraska irrigates approximately 7.5 million acres with more than 8.45 million acre-feet (2.75 trillion gallons) of water annually. The 2007 Ag Census suggests that irrigated acres have increased to 8.45 million acres of cropland. In 2004, state policy established a process for defining watersheds as a fully or over-appropriated. Part or all of eleven Natural Resource Districts are currently defined as fully or over-appropriated. In 2008, additional land area has been proposed to be designated as fully appropriated. The combined area would represent about two-thirds of Nebraska's land area. Over-appropriated basins are required to reduce water use to 1997 levels.

What has been done

Research is evaluating no or limited till practices for conserving irrigation water use, implications of public policy on irrigation water use, and improved prediction and measurement of crop evapotranspiration. UNL faculty are implementing a Water Optimizer tool to help plan limited water use for obtaining maximum return. Currently validated for common row crops, the model is being adapted to several western Nebraska crops where water limitations are first being experienced. UNL educational initiatives include educational conferences and field days including the Nebraska Agricultural Water Management Demonstration Network (NAWMDN), an on-farm extension initiative demonstrating irrigation water savings through in-field ET and soil moisture monitoring, engaged over 300 irrigators in 2008. This network of irrigators share over the web on-farm data on critical irrigation scheduling field measures.

Results

Currently proven technologies and management practices have the potential to reduce statewide irrigation water pumped by 2 inches (or 460 billion gallons per year) or more and energy use by 42 million gallons of diesel fuel equivalent per year or more. In addition, for every acre-inch of water not pumped, we benefit from 55 pounds of reduced CO2 emissions creating a current potential for a 490,000 tons of reduction in CO2 emissions. 2008 irrigation water use programs resulted in more that 8000 learner hours, about 2,700 learners, and the equivalent of about 50 workshops of 3-hour length. Participants estimated that the skills gained during the educational experiences would allow them to reduce water use between 1.4 and 2.6 inches of water per acre. Additional participants included crop consultants, Natural Resource District and USDA agency staff, and extension educators that influence management of many irrigated acres.

4. Associated Knowledge Areas

KA Code	Knowledge Area
405	Drainage and Irrigation Systems and Facilities
112	Watershed Protection and Management
111	Conservation and Efficient Use of Water
102	Soil, Plant, Water, Nutrient Relationships

Outcome #2

1. Outcome Measures

Nebraska farmers, ranchers, businesses and home owners will adopt new practices that will improve water management and protect water quality. This will be measured as the percentage of education program participants who indicate that they have adopted or plan to adopt new practices.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	70	75

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Agriculture impacts water quality. A 2008 Surface Water Quality Report suggests that dissolved oxygen, atrazine, and ammonia are stable for rivers. It further suggests that lakes and reservoirs remain stable for four water quality parameters. The 2008 Nebraska Ground Water Quality Report suggests 'indicates an overall upward trend for nitrates statewide based on the median concentration. However, the last six years of data suggest that the nitrate concentration may be decreasing. The mean atrazine concentration has also decreased within the last eight years.'

What has been done

Example research programs include effectiveness of irrigated crop management practices for reducing groundwater nitrate contamination, pollution and economic decision tools for impaired water management plans, and buffalograss variety development to reduce homeowner and golf course water and fertilizer use. Extension hosts educational experiences targeting issues related to water quality impairment from nitrogen, erosion, and herbicides and encouraging and best practices for reducing contamination associated with tillage, irrigation, fertilization, chemigation, on-site waste water, and municipal storm water. In 2008, 109 workshops were conducted delivering more than 7300 learner-hours of instruction targeting improved water quality attended by more than 2400 farmers, consultants, and other professions.

Results

Sample outcomes or impacts include: (1) Emergence of UNL as a national leader in buffalo grass research; (2) Application of high resolution infrared camera technologies for studying groundwater flows and surface and groundwater connections; (3) Piloting of educational programs targeting municipalities recently regulated under the EPA Phase II Clear Water Act requirements which reached 233 city administrators, public works employees, and green space industry professionals; (4) Hosting of a Regional No-Till Conference attended by 434 participants representing just short one half million acres that estimated a value of $4.6 million from practices likely to be adopted; (5) Release of the comprehensive UNL water web site built around 11 Extension Water Program issues teams. The site has experienced 63,605 page views by 20,000 visitors in its first 5 months; (6) CSREES water program sponsored regional training of professionals on impact assessment tools for water quality protection.

4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management
102	Soil, Plant, Water, Nutrient Relationships
405	Drainage and Irrigation Systems and Facilities
132	Weather and Climate
403	Waste Disposal, Recycling, and Reuse
605	Natural Resource and Environmental Economics
121	Management of Range Resources
111	Conservation and Efficient Use of Water
131	Alternative Uses of Land

Outcome #3

1. Outcome Measures

Livestock producers will continue to gain knowledge and awareness of appropriate practices to manage livestock manure.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	400	18000

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Individuals involved in public policy issues, animal production, and delivery of technical services for confined animal systems need on-demand access to the nation's best science-based resources. This information is critical to preparing and implementing good public policy and to advising animal producers on nutrient and manure management decisions. Access to such information is generally limited through traditional continuing education opportunities and published resources.

What has been done

Faculty research has addressed critical topics such as excretion, fate, and transport of endocrine disrupting compounds from beef cattle, development of a NE Odor Footprint Tool for sitting of animal facilities, and reduction of phosphorus risk associated with cattle manure on a diet high in distillers grains. Extension programs have focused on demonstration of appropriate technologies for small animal feeding operations for addressing open lot runoff and providing local public officials and livestock producers with a tool for defining the area of impact by odor from new or expanded livestock facilities - NE OFT. The Livestock Environmental Learning Center, a national project co-lead by UNL faculty, launched a national eXtension web site on Animal Manure in 2008 and hosted 12 web cast workshops.

Results

Key accomplishments in 2008 include: (1) The Learning Center library of 26 web cast seminars presented by 58 experts from 19 universities, US EPA, USDA (ARS, CSREES, and NRCS), USGS, and other organizations is viewed by more that 1500 individuals monthly who each influence the decisions of 197 producers annually; (2) 205,000 page views of the Learning Center eXtension web resources were counted during the first 10 months of its existence; (3) Users of Learning Center resources have significantly or moderately improved their nutrient plan recommendations (51% of those surveyed), application of emerging technologies (65%), ability to gain value from manure use (57%), public policy implementation development (40%) and (57%); (4) The demonstration of appropriate technologies has installed four additional demonstrations of vegetative treatment systems on small livestock operations in 2008 (total of 36 since 2000) and 1 on a permitted operation and hosted one in-depth training course for consultants on VTS design.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
133	Pollution Prevention and Mitigation
403	Waste Disposal, Recycling, and Reuse
101	Appraisal of Soil Resources
112	Watershed Protection and Management
605	Natural Resource and Environmental Economics
405	Drainage and Irrigation Systems and Facilities

Outcome #4

1. Outcome Measures

Livestock producers will develop comprehensive nutrient management plans (CNMPs) and use best management practices for livestock manure handling and storage.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	300	188

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Nutrient management plans (NMPs) are the foundation for environmental stewardship in livestock operations. NMPs are an essential expectation for cost share assistance through NRCS and required for USEPA and state of Nebraska permitting programs.

What has been done

Research targeting manure and fertilizer application for continuous corn was the only active project in 2008. A team of extension specialists and educators conducted two 2-hour distance learning workshop to re-certify livestock producers to meet Land Application training requirements. These programs were attended by 148 producers by traveling to a local extension office or from their home or office computer. The program focused on regulations updates, impacts of feeding distillers grains on a nutrient plan and other topics. An additional 40 newly permitted producers attended one of two 5-hour workshops on Land Application Training to also meet state regulations. The skills taught include regulations overview, identifying manure setback locations, preparing and implementing a nutrient plan, and identifying record needs.

Results

Participants in the recertification program (representing 1.36 million animals) reported increasing their knowledge of regulatory changes (93% of respondents), of P-Index application (91%), and impacts of distillers grain use on nutrient plans (90%). Convenience of attending by distance learning technologies (53% at a local extension office and 47% from a home or office) was an advantage for 91%. A second survey was conducted of participants in Land Application Training for the period of 2000 through 2007 to determine behavior and practice changes. Those responding had completed a review of the operation's compliance with regulations (66%), review or modification of record keeping procedures (62%), and improvements to nutrient plan implementation (53%). As a result of attending the class they were satisfied with their compliance with manure application record requirements (98%), had reduced fertilizer use due to efficient manure use (66%), and were spending more time on manure management (72%). Of the 928 Nebraska permitted livestock operations, 69% satisfied training requirements through Extension delivered educational programs with the remaining through a home study option utilizing Extension's CNMP workbook.

4. Associated Knowledge Areas

KA Code	Knowledge Area
121	Management of Range Resources
605	Natural Resource and Environmental Economics
112	Watershed Protection and Management
133	Pollution Prevention and Mitigation
403	Waste Disposal, Recycling, and Reuse
131	Alternative Uses of Land
405	Drainage and Irrigation Systems and Facilities
102	Soil, Plant, Water, Nutrient Relationships

Outcome #5

1. Outcome Measures

Nebraska farmers will increase their knowledge and awareness of how integrated pest management and pesticide best management practices can help protect water quality.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	5000	12700

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

A variety of pest problems occur in Nebraska, including insects, weeds and plant diseases. Economically important pest species may vary by location within state and by year. Users of IPM need skills to identify and assess pest problems, and make intelligent management decisions, taking into account relevant economic, environmental, and health issues. The diversity of cropping systems and environments across Nebraska challenges faculty to identify site-specific IPM systems for adoption. In addition, genetically modified crops have presented new opportunities for reducing pesticide use and created new challenges for minimizing emergence of resistant weeds and insects.

What has been done

Research addresses multiple topics including 1) genetic development of crops suited to a variety of growing conditions, 2) corn rootworm evaluation for managing resistance to Bt plants (UNL collaborates with 21 institution team in US and Europe), and 3) fundamental research of plant ability to fend off diseases. IPM Extension programs include a weekly IPM newsletter for northeast Nebraska producers, Pesticide Safety Education program reaching 11,000 applicators (2008), Crop Protection Clinics reaching 1,500 agribusiness representatives and producers, Soybean Cyst Nematode (SCN) demonstration plots and field days hosted on SCN infected sites, distribution of 17,000 copies of a new Guide for Weed Management, Digital commons on Wildlife Damage Management, Urban Pest Management Conference attended by 167 professionals.

Results

* Pesticide Safety Education reduced health effects from exposure (94% of participants), reduced potential for drift (90%), took steps to reduce pesticide residue in tractor cabs and inside homes (99%).
* Crop Protection Clinics were valued by producers at $4 per acre ($28 million overall) due to improved source pathogen ID in corn diseases, knowledge of SCN characteristics, nozzle selection for reduced drift.
* Soybean Cyst Nematode (SCN) demonstrations had an producer estimated value of $35 per acre or more than $2.5 million.
* Digital commons on Wildlife Damage Management supplied 182,676 download requests.
* Urban Pest Management Conference improved pesticide use practices (52% of participants), pesticide safety procedures (52%) and knowledge of laws and regulations (84%).

4. Associated Knowledge Areas

KA Code	Knowledge Area
121	Management of Range Resources
124	Urban Forestry
112	Watershed Protection and Management
133	Pollution Prevention and Mitigation
131	Alternative Uses of Land
605	Natural Resource and Environmental Economics
125	Agroforestry
123	Management and Sustainability of Forest Resources

Outcome #6

1. Outcome Measures

Nebraskans will gain increased awareness and knowledge of natural resources including wildlife, forest resources and rangeland and the relationship between natural resources stewardship, sustainability, economic viability and the environment.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	5000	7900

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Nebraska natural resources are critical to sustaining the state's population and economy. Approximately 50% of the state's land is pasture or rangeland and nearly 40% is crop land which is the foundation for a $12 billion agricultural economy (2006) and a rapidly expanding ethanol industry. The water resources sustain production on 50% of the cropland resources. The land and water resources also support a myriad of biological resources critical to outdoor recreation. Energy is also emerging as a critical issue to Nebraska with the developments in biofuels and wind energy.

What has been done

Research and Extension provides a wide variety of activities in 2008 including: (1) Nationally recognized research and education from the National Drought Mitigation Center; (2) Development of sweet sorghum as a alternative source for ethanol fuel production; (3) Certification of four UNL organic research farm sites for organic production research and supporting extension education program promoting organic and diversified farming opportunities; (4) Energy education programs addressing ethanol by-product utilization, wind energy land owner contracts, biodiesel crop production, and extension educators biofuels forums; (5) Holistic range management research and educational programs integrating natural resources management with profitability.

Results

In 2008, Extension hosted 112 3-hr equivalent workshops attended by 7,900 learners and delivered almost 24,000 learner-hours of educational experiences. Some critical outcomes include: (1) 600+ Nebraska landowners and 40+ Extension Educators from 9 states were introduced to wind energy contract issues for land owners through 7 workshops and a series of three multi-state distance learning seminars; (2) 700 farmers, consumers, consultants, or other constituents representing 48,259 acres and 1000 livestock (130 certified organic farmers) were introduced to research based organic production practices and technologies; (3) in-depth Ranch Practicum programs and less intensive Beef Profitability and Monitor Your Range Workshops reached 180 participants that directly impacted 46,600 cows, 67,000 feeder cattle and 665,000 acres of range on sustainable range management and improved range decision making skills; (4) an ethanol by-products workshop (of multiple hosted in 2008) reached 65 cow/calf and farmer feeder cattle producers on storage and management techniques for utilizing less expensive distiller's grains products on small livestock operations is representative of many held in 2008.

4. Associated Knowledge Areas

KA Code	Knowledge Area
141	Air Resource Protection and Management
124	Urban Forestry
405	Drainage and Irrigation Systems and Facilities
131	Alternative Uses of Land
121	Management of Range Resources
133	Pollution Prevention and Mitigation
403	Waste Disposal, Recycling, and Reuse
125	Agroforestry
122	Management and Control of Forest and Range Fires

134	Outdoor Recreation
123	Management and Sustainability of Forest Resources
135	Aquatic and Terrestrial Wildlife

Outcome #7

1. Outcome Measures

Consumptive water use by irrigated crops will be reduced. The outcome measure will be the percent reduction of estimated consumptive water use when the current year is compared to the estimated consumptive water use in calendar year 2006. The consumptive water use will be estimated using the irrigation water pumped in Natural Resources Districts that require the use of water measurement devices.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	5	8

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

According to the USDA 2003 Farm and Ranch Irrigation Survey, Nebraska irrigates approximately 7.5 million acres with more than 8.45 million acre-feet (2.75 trillion gallons) of water annually. The 2007 Ag Census suggests that irrigated acres has increased to 8.45 million acres of cropland. In 2004, state policy established a process for defining watersheds as a fully or over-appropriated. A Part or all of eleven Natural Resource Districts are currently defined as fully or over-appropriated. In 2008, additional land area has been proposed to be designated as fully appropriated. The combined area would represent about two-thirds of Nebraska's land area. Over-appropriated basins are required to reduce water use to 1997 levels.

What has been done

Research is evaluating no or limited till practices for conserving irrigation water use, implications of public policy on irrigation water use, and improved prediction and measurement of crop evapotranspiration. UNL faculty are implementing a Water Optimizer tool to help plan limited water use for obtaining maximum return. Currently validated for common row crops, the model is being adapted to several western Nebraska crops where water limitations are first being experienced. UNL educational initiatives include educational conferences and field days including the Nebraska Agricultural Water Management Demonstration Network (NAWMDN), an on-farm extension initiative demonstrating irrigation water savings through in-field ET and soil moisture monitoring, engaged over 300 irrigators in 2008. This network of irrigators share over the web on-farm data on critical irrigation scheduling field measures.

Results

The 8% reduction is based upon irrigation water use data from 6 NRDs currently collecting data and is a comparison of 2008 vs the average of (2005 to 2007). Water use in those NRDs has decreased from 15.0 million (6.3 inches/certified acre) to 13.9 million acre-inches (6.0 inches per certified acre) between 2005 and 2008. Currently proven technologies and management practices have the potential to reduce statewide irrigation water pumped by 2 inches (or 460 billion gallons per year) or more and energy use by 42 million gallons of diesel fuel equivalent per year or more. In addition, for every acre-inch of water not pumped, we benefit from 55 pounds of reduced CO2 emissions creating a current potential for a 490,000 tons of reduction in CO2 emissions. 2008 irrigation water use programs resulted in more that 8000 learner hours, about 2,700 learners, and the equivalent of about 50 workshops of 3-hour length. Participants estimated that the skills gained during the educational experiences would allow them to reduce water use between 1.4 and 2.6 inches of water per acre. Additional participants included crop consultants, Natural Resource District and USDA agency staff, and extension educators that influence management of many irrigated acres.

4. Associated Knowledge Areas

KA Code	Knowledge Area
111	Conservation and Efficient Use of Water
405	Drainage and Irrigation Systems and Facilities
123	Management and Sustainability of Forest Resources
131	Alternative Uses of Land
102	Soil, Plant, Water, Nutrient Relationships
605	Natural Resource and Environmental Economics
132	Weather and Climate
112	Watershed Protection and Management

Outcome #8

1. Outcome Measures

Nebraska will not exceed its allocation of water in the Republican River as allowed by the interstate compact with Kansas and Colorado. Nebraska's allocation is 49% of the average annual water supply. The output measure will be the percent of the Republican River average annual water supply used by Nebraska.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	49	43

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The Republican River Compact allocates the water supply of the Republican River, originally set at 11% to CO, 49% to NE and 40% to KS. 2008 consumptive use estimates suggest the Nebraska was under its allocation by 78,000 acre-feet. For the five year running average, it exceeds its allocation by less than 200 acre-feet. Natural Resource Districts have developed plans that are contributing towards achieving the targeted allocation than includes retirement of irrigated acres, improvements in efficiency of irrigation water use, and limitations on irrigation development. Much of the improvement to date has been a result of more favorable rainfall conditions.

What has been done

The research program at our West Central Research and Extension Center has evaluated water conservation strategies with a recent focus on water savings from conservation tillage and skip row planting. Eleven on-farm demonstrations were hosted in the region focused on irrigation scheduling, no-till farming and nitrogen rate vs irrigation rate interactions. Thirteen field tours, and 7 workshops were hosted in or near the Republican River basin. A new partnership of the four center pivot manufacturers, UNL Extension, and NE Environmental Trust targets information delivery through the manufacturers' dealer and distribution networks. This collaborative efforts reaches producers through dealer meetings and one-on-one industry sales and repair personnel. It is addressing efficient sprinklers packages, energy pumping costs performance auditing, tools for irrigation scheduling, limited irrigation strategies for minimizing yield loss, and software tools for determining best use of limited water.

Results

One-hundred-sixty producers attending the 8 field day programs estimated based upon practices they planned to adopt a likely savings of 2.2 acres-inches per acre (31,300 ac-ft/yr) at a value of $21 per acre or $3.6 million per year. This group represented about 60% of the crop producer participants. An additional 40 agri-business representatives participants each influence management decisions on an average of 39,000 acres per year and estimated the economic value of the practices introduced would be about $5.8 million. Five field days not evaluated reached a similar size audience. In addition, The 200 surveyed participants attending the seven classroom workshops estimated a likely water savings of about 1.4 acre-inches/acre over 400,000 acres.

4. Associated Knowledge Areas

KA Code	Knowledge Area
111	Conservation and Efficient Use of Water
605	Natural Resource and Environmental Economics
112	Watershed Protection and Management

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought,weather extremes,etc.)
- Economy
- Public Policy changes
- Government Regulations
- Competing Public priorities

Brief Explanation

Natural disasters: Drought conditions have subsided in 2008 with the exception of western Panhandle. This has eased some of the concerns with water availability for irrigation.
Economy: 2008 was a year of extreme volatility for crop and animal production costs and crop prices. The declining economy has also dampened demand for meat products and forced prices to low levels. Economic survival will be foremost on the minds of most livestock and crop producers in 2009.
The development of the ethanol industry has brought significant economic development and income potential to many rural areas. A temporary correction in the feasibility of corn ethanol fuels has slowed this growth but many expect the return of higher fuel prices and increased ethanol demand.
Public policy and Government Regulations: Public pressure by the Human Society of the US is causing significant concerns among all agricultural organizations. Policy implementation in California and other states sponsored by HSUS is seen as promoting economically unsustainable agricultural practices in the US by agricultural organizations.
Appropriation Changes: Reduced state tax collection is likely to lead to a smaller university budget over the next two years. This will likely cause elimination of some research and extension program areas.

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- During (during program)

Evaluation Results

The Food Production and Natural Resources program has released statewide evaluation tools targeting clientele outcomes identified in the statewide action plan. These tools will allow statewide measure of program impact. Tools were release January 6, 2009 for crop production, livestock production, natural resources, and food safety. These tools will target educational program evaluation and provide a means of estimating knowledge gain, intended practice change, and likely conditional changes. The team leaders are beginning discussion of a post educational program tool to identify actual behavior and condition changes. Currently, program impacts are defined for individual events or initiatives. One example is the Irrigation and Energy Conservation Field Days. In 2008, 152 participants, who manage or influence decisions on 519,000 acres, attended a one-day clinic. The clinic was valued at $14 per acre (about $7,300,000 total value) by the participants. 91% of participants definitely or probably will make water management changes based upon the field knowledge gained at the Energy Conservation Field Days.

Key Items of Evaluation

Impact indicators and supporting statewide survey tools have been developed for knowledge gain, behavior change and conditional changes for the following outcomes for Natural Resources Systems:
Irrigation water use efficiency will increase by 10%.
Reduce potential for pesticide contamination and other non-point source pollutants of surface and ground water resources.
Improve surface water and ground water quality reducing contamination by manure and fertilizer nutrients
Nebraskans will have improved management of biological resources including trees and shrubs in community and rural landscapes, wildlife, grasslands, native prairie, wetlands, and natural areas to benefit people and conserve the diversity of native plants, insects, and wildlife.
Youth, adults, and families will increase their appreciation and understanding of the natural environment and of the relationships between natural resource stewardship, resource sustainability, economic viability, and quality of life.
Nebraskans will increase understanding and utilization of energy conservation and renewable energy including, wind, solar, ethanol, biodiesel, biomass, including in-home and on the farm.

Program #3

V(A). Planned Program (Summary)

1. Name of the Planned Program

Viable Communities and Appropriate Quality of Life for Individuals and Families

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
607	Consumer Economics	1%		1%	
608	Community Resource Planning and Development	5%		3%	
701	Nutrient Composition of Food	12%		7%	
702	Requirements and Function of Nutrients and Other Food Components	12%		22%	
703	Nutrition Education and Behavior	10%		7%	
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	14%		21%	
721	Insects and Other Pests Affecting Humans	1%		1%	
722	Zoonotic Diseases and Parasites Affecting Humans	1%		1%	
723	Hazards to Human Health and Safety	6%		6%	
724	Healthy Lifestyle	1%		1%	
801	Individual and Family Resource Management	4%		1%	
802	Human Development and Family Well-Being	14%		18%	
803	Sociological and Technological Change Affecting Individuals, Families and Communities	4%		7%	
804	Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures	4%		1%	
805	Community Institutions, Health, and Social Services	1%		2%	
806	Youth Development	10%		1%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2008	Extension		Research	
	1862	**1890**	**1862**	**1890**
Plan	49.0	0.0	14.0	0.0
Actual	80.0	0.0	15.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	**1890 Extension**	**Hatch**	**Evans-Allen**
1950360	0	636926	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
1946119	0	430456	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
18508664	0	8438456	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

- The institute will conduct research and deliver extension education programs that will enable Nebraskans to strengthen their families and communities. Output efforts will help reduce food-borne illness, increase healthy eating and active behaviors, increase number of self-confident community leaders and increase the number of communities with access to tools to aid economic development.
- Increasingly, learners lead time-pressed lives and want to access educational information at their convenience. While face-to-face teaching remains an ongoing focus of our efforts, many learners may choose to access educational information online through Internet sites, module learning and ask-an-expert. Therefore, we will employ a blend of teaching strategies to accomplish our educational goals and research of reaching individuals who want just-in-time research-based information and in depth behavior changing educational experiences.

2. Brief description of the target audience

Our targeted audiences include:

1. Food processing and retail establishment owners and staff
2. Children, youth and families
3. Youth and adults in community leadership roles
4. Entrepreneurs
5. Local and state decision makers

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	**Target**	**Target**	**Target**	**Target**
Plan	10000	20000	50000	20000
2008	11000	22000	52000	100000

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year **Target**
Plan: 0

2008 : 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	10	10	
2008	10	10	20

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- 1) Number of scholarly publications and outputs related to viable communities and appropriate quality of life for individuals and families projects accepted.

Year	Target	Actual
2008	20	20

Output #2

Output Measure

- 2) Number of extension in-depth community, family and Individual topic-related educational workshops.

Year	Target	Actual
2008	35	37

Output #3

Output Measure

- 3) Number of extension community, family and individual program-related curricula, publications and other educational resources developed.

Year	Target	Actual
2008	10	10

Output #4

Output Measure

- 4) Number of Agricultural Research Division projects that focus on community and appropriate quality of life for individuals and families issues.

Year	Target	Actual
2008	3	6

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	OUTCOME NAME
1	Nebraska's will gain knowledge to make effective choices about their health, wellness and diet to reduce their health care costs. This will be measured by comparing annual statistics from Nebraska Health and Human Services (NHHS) for Nebraskans having a decreased prevalence of obesity, heart disease and osteoporosis and reduced dependence on medical care for diet-related diseases. Individuals will increase knowledge of food selection and preparation with reduced fat and/or calories, USDA serving sizes and importance of adequate time spent in physical activity each day and increased understanding of the relationships between diet and physical activity to improve personal health. Individuals will select, prepare and eat recommended amount of fruits, vegetables, low-fat proteins and dairy and whole grains. In addition, individuals will better balance their intake of calories with their energy expenditures.
2	Nebraska's communities will have access to the tools they need to retain current residents and businesses and create opportunities for new residents and businesses. This will be measured by comparing annual statistics from the Nebraska Department of Economic Development (NDED) and surveys/case studies. Community leaders and business owners will understand the importance of strategic planning, support business development techniques and information technology to support community's development. Businesses within communities will work to be more profitable, entrepreneurs will be supported by the communities and informational technology will be used effectively to support community growth. Communities will have planned for the future, new businesses will have been created, and informational technology will be used to create partnerships between the community's public and private sectors.
3	Nebraska's youth will be informed decision makers and remain active members of their communities as they reach adulthood. This will be measured by surveys, interviews and case studies to document evidence of the benefits (impact) to a community for involving youth in the decision making process. Nebraska will have evidence of the roles and responsibilities that youth are assuming at the community level such as being included on community agendas, leading community decisions and helping establish community policies. Community members will have an increased understanding of how youth can engage with adults in a community decision making process to solve problems impacting their communities. Youth and adults will report improved decision making and problem solving skills. The number of youth engaged as partners in community civic activities will increase.
4	Food handlers will practice safe food handling procedures to reduce food-borne illness outbreaks. This will be measured by comparing annual Nebraska statistics from Nebraska Health and Human Services (NHHS) for reduced incidents of food-borne illness because of safe food handling, decreased medical costs due to food-borne illness outbreaks and decreased days lost from work. Food handlers (food service workers, food processors and livestock producers) will increase their knowledge of safe food handling practices measured by increased knowledge about adequate food handling and preparation and animal management practices. Food handlers will implement safe food handling practices for the reduction of food borne illnesses because of strategies learned through ServSafe, HAACP and Quality Assurance.
5	Families will contribute to community viability and maintain sustainable lifestyle to provide a safe and secure future for their children. Long-term: Families will increase financial assets by decreasing debts. Intermediate: Individuals and families will (1) establish long-term financial goals to guide decision making, (2) will decrease spending, and (3) will practice saving regularly. Short-term: Individuals and families will (1) evaluate spending patterns, (2) identify income and expenses, (3) make and implement a budget, and (4) develop and implement a savings plan.

Outcome #1

1. Outcome Measures

Nebraska's will gain knowledge to make effective choices about their health, wellness and diet to reduce their health care costs. This will be measured by comparing annual statistics from Nebraska Health and Human Services (NHHS) for Nebraskans having a decreased prevalence of obesity, heart disease and osteoporosis and reduced dependence on medical care for diet-related diseases. Individuals will increase knowledge of food selection and preparation with reduced fat and/or calories, USDA serving sizes and importance of adequate time spent in physical activity each day and increased understanding of the relationships between diet and physical activity to improve personal health. Individuals will select, prepare and eat recommended amount of fruits, vegetables, low-fat proteins and dairy and whole grains. In addition, individuals will better balance their intake of calories with their energy expenditures.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	1000	1000

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Health care costs continue to rise. Combined with the economic downturn, this means that some families must forgo health care treatment in order to make ends meet. Preventative health care and the adoption of healthful eating and physical activity behaviors leading to long-term changes is encouraged. These changes can improve the quality of life, reduce chronic disease, help families stabilize their health care budget, and improve the state's economy in general.

What has been done

Preventative health care (i.e., increasing physical activity, choosing healthy foods) has been the goal of Extension educational programs statewide. Train the trainer programs have been conducted with food service providers, state agency representatives, and health organizations. Programs directly targeting clientele, especially those of highest health risk, have been conducted. In addition, educational programs for young people through 4-H and in partnership with other youth serving organizations has been valuable in reaching young audiences.

Results

One example program, A New You, is a 6-week course which helps Nebraska adults learn about and adopt healthy body images, appropriate eating behaviors, and increase their activity. Using a health-centered, rather than weight-centered, approach, class participants examine eating styles and how those styles affected eating habits.

In its second year, 49 participants completed the series in five locations. Participants made substantial changes in 14 out of 15 eating and activity habits. Those habits where the greatest amount of change occurred included: eating slowly, focusing on food when eating, stopping eating when fullness was sensed, leaving food on one's plate when full, responding to emotions by exercising or other activity besides eating, and keeping a food and activity journal to reflect progress on health behavior goals.

4. Associated Knowledge Areas

KA Code	Knowledge Area
802	Human Development and Family Well-Being
724	Healthy Lifestyle
703	Nutrition Education and Behavior
701	Nutrient Composition of Food

801	Individual and Family Resource Management
702	Requirements and Function of Nutrients and Other Food Components

Outcome #2

1. Outcome Measures

Nebraska's communities will have access to the tools they need to retain current residents and businesses and create opportunities for new residents and businesses. This will be measured by comparing annual statistics from the Nebraska Department of Economic Development (NDED) and surveys/case studies. Community leaders and business owners will understand the importance of strategic planning, support business development techniques and information technology to support community's development. Businesses within communities will work to be more profitable, entrepreneurs will be supported by the communities and informational technology will be used effectively to support community growth. Communities will have planned for the future, new businesses will have been created, and informational technology will be used to create partnerships between the community's public and private sectors.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	25	25

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Because Nebraska is large in size (15th nationally) and low in population (1.7 million people), capitalizing on the strengths of communities is vital to the economic development of our state. Decision makers are constantly concerned about the success of local businesses, community development, and vitality. In addition, strategies for keeping young people in the state are an important part of our state's growth.

What has been done

Extension is working statewide to develop human capacity and contribute to communities' economic, social, and cultural capital. Programs focusing on e-commerce and e-government have helped communities better use their resources while expanding across geographic boundaries. In addition, targeted leadership programs have increased the pool of potential community leaders and helped communities think strategically about how they can strive.

Results

An Extension course in e-business has led Nebraska businesses to open e-stores or have an e-presence leading to exposure in new markets and increased sales. As a result of the course, 71% of those businesses not currently having an online store anticipated starting one.

The NACO Institute of Excellence, a collaboration between Extension and the Nebraska Association of County Officials (NACO), prepared county board members to govern using effective leadership strategies. As a result of this program participants changed their attidtudes about working with others. Almost two-thirds of the participants responding to a survey reported their expectations for what can be accomplished in their role as county supervisors and commissioners changed, because of the Institute of Excellence.

4. Associated Knowledge Areas

KA Code	Knowledge Area
801	Individual and Family Resource Management
607	Consumer Economics

608	Community Resource Planning and Development
804	Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures
805	Community Institutions, Health, and Social Services

Outcome #3

1. Outcome Measures

Nebraska's youth will be informed decision makers and remain active members of their communities as they reach adulthood. This will be measured by surveys, interviews and case studies to document evidence of the benefits (impact) to a community for involving youth in the decision making process. Nebraska will have evidence of the roles and responsibilities that youth are assuming at the community level such as being included on community agendas, leading community decisions and helping establish community policies. Community members will have an increased understanding of how youth can engage with adults in a community decision making process to solve problems impacting their communities. Youth and adults will report improved decision making and problem solving skills. The number of youth engaged as partners in community civic activities will increase.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	250	250

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Helping young people positively contribute to communities as responsible citizens and willing public servants is an important to the long-term growth of the state. Active youth involvement in decision-making and problem solving gives young people a vested interest in the success of their communities and gives them the skills they need to be successful adults.

What has been done

On-going program efforts support youth decision making and community involvement. All counties are encouraged to have youth representation on 4-H Councils and Extension boards. Teaching skills such as communication, leadership, and decision making is a part of all Extension youth development programs regardless of content area. In addition, special programs target those populations which might be less likely to have access to leadership opportunities. PRIDE is an example of this kind of programming.

Results

PRIDE (People Restoring Involvement, Dignity and Excellence) targets strengthening youth-adult partnerships among the Latino population in Western Nebraska. The group meets regularly to learn and practice leadership skills in partnership with caring adults. As a result of this work, youth have made presentations to local civic organizations, attended local board meetings to gain support for their efforts, and participated in city council meetings to voice their opinions and show support community endeavors. Group members have indicated that, as a result of being in the group, they have a greater appreciation for their community, have gained skills in organizing and planning group activities, can identify resources, are able to teach others, can effectively communicate their ideas with others in the community, and can work as a team member.

4. Associated Knowledge Areas

KA Code	Knowledge Area
802	Human Development and Family Well-Being
806	Youth Development

Outcome #4

1. Outcome Measures

Food handlers will practice safe food handling procedures to reduce food-borne illness outbreaks. This will be measured by comparing annual Nebraska statistics from Nebraska Health and Human Services (NHHS) for reduced incidents of food-borne illness because of safe food handling, decreased medical costs due to food-borne illness outbreaks and decreased days lost from work. Food handlers (food service workers, food processors and livestock producers) will increase their knowledge of safe food handling practices measured by increased knowledge about adequate food handling and preparation and animal management practices. Food handlers will implement safe food handling practices for the reduction of food borne illnesses because of strategies learned through ServSafe, HAACP and Quality Assurance.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	2000	2000

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Safe food is vital to Nebraskans and Nebraska's economy. Because agriculture and food processing are Nebraska's main industry, food safety is both an economic and health issue. Safe food handling practices benefit the entire state in reduced food borne illness and the associated reduced health care costs.

What has been done

Extension continues to be a prominent provider of ServSafe with over 500 food service employees participating statewide. This 16-hour program covers all aspects of food safety including microbial contamination, food handling, worker hygiene, facilities and equipment. Workshop delivery methods include lecture using slides and videos, experiments, quizzes and games.
In addition: On-going food safety training is conducted for occasional quantity cooks, school cooks, and daycare providers; Quality Assurance training programs are required for those youth showing meat animals through 4-H; and food safety labels reminding participants how to safely store uneaten food were developed for Meals on Wheels recipients.

Results

Participants in the Food Safety Task Force training gained knowledge about salmonella, related outbreaks and lessons learned (33%), bare-hand contact and the importance of proper handwashing (20%), PHF versus TCS foods (39%) and food recalls (65%).
Surveys show that individuals who successfully complete ServSafe course increase knowledge about overall safe food handling practices by 33%; knowledge about thermometer use by 24%; knowledge about sanitation by 147%; and knowledge about the Hazard Analysis and Critical Control Points (HACCP) system by 71%. Each of those trained reaches a minimum of 10 other individuals meaning this program impacted over 5,000 food service workers in the past year.

4. Associated Knowledge Areas

KA Code	Knowledge Area
723	Hazards to Human Health and Safety
721	Insects and Other Pests Affecting Humans
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins
722	Zoonotic Diseases and Parasites Affecting Humans

805	Community Institutions, Health, and Social Services

Outcome #5

1. Outcome Measures

Families will contribute to community viability and maintain sustainable lifestyle to provide a safe and secure future for their children. Long-term: Families will increase financial assets by decreasing debts. Intermediate: Individuals and families will (1) establish long-term financial goals to guide decision making, (2) will decrease spending, and (3) will practice saving regularly. Short-term: Individuals and families will (1) evaluate spending patterns, (2) identify income and expenses, (3) make and implement a budget, and (4) develop and implement a savings plan.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	100	100

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

National consumer debt reached an all-time high and continues to grow. Families who are able to reduce their debt and better manage their finances are better able to care for their children and provide positive benefits to their communities. This means less reliance on government resources and a stronger state economy.

What has been done

Extension's Pay Down Debt website contains basic budgeting guidelines, tips to reduce spending, worksheets to keep track of expenses and income and to help analyze the best debt payment plan. In addition, there are links to other financial education resources. By joining the site, participants are able to save their worksheets so they can return at their convenience to work on their own personal budgets.

Results

More than 1,300 unique site visits are made to the Pay Down Debt website annually. Evaluations from users show that over 75% of site visitors intend to use it to help reduce their debt by an average of $18,000+ per household. Participants in the Real World Money program significantly increased their knowledge levels in six areas in a pre/post evaluation: how to balance ledger; how to write checks; making purchase decisions; need to track spending; knowing where money goes in family living; the need for saving; the impact of emergencies; differences between wants and needs. Sixty-five percent of program participants report planning to save more money.

4. Associated Knowledge Areas

KA Code	Knowledge Area
801	Individual and Family Resource Management

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought,weather extremes,etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations

Brief Explanation

Nebraska demographics continue to change. Decreasing rural populations plus changes in ethnicity create added challenges for families, schools, and communities.

While the Nebraska economy is more stable than many states, the economic downturn has taken its toll as can be seen in increased unemployment rates which means a loss of job benefits for many families. These job losses have been especially difficult for families in rural areas and small towns where there are a limited number of other employment opportunities.

As a rural state, Nebraska is highly dependent on the agricultural economy. Changes in the bio-fuels industry and the price of corn have caused shut downs in ethanol plants and added economic stress to many small communities. Re-focusing of positions to meet high priority needs may mean that some traditional or out-dated programs may not be available.

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- Retrospective (post program)
- Before-After (before and after program)
- Case Study
- Comparisons between different groups of individuals or program participants experiencing different levels of program intensity.

Evaluation Results

Statewide data collection using a common insturment continues to be a goal of UNL Extension.The process develop in 4-H Youth Development continues to grow.In 2008, 1,500 young people took part in the statewide 4-H survey.Example survey results show:

- 97% of graduating 4-H seniors went on to higher education.
- 92% of 4-H club members lea4rend skills they could apply in a future job.
- 68% are planning on pursuing a career in SET.

Key Items of Evaluation

UNL Extension Action Teams are working to develop statewide assessment tools that will be used to measure achievement of outcomes across each program area.This process has been working successfully in 4-H youth programs and is being replicated in the areas of health, food safety, nutrition, and family programs.