2010 North Dakota State University Combined Research and Extension Annual Report of Accomplishments and Results

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I. Report Overview

1. Executive Summary

One of the chief pillars of North Dakota's economy is a vibrant and dynamic agricultural sector. Production agriculture provides about 25% of North Dakota's gross state product. The entire agribusiness sector accounts for almost 40% of the state's economic activity. However, today's agriculture is not the same as it was 20 or 10 or 5 years ago. Agriculturists in our state have been quick to adopt new technologies and techniques, to move aggressively into new and expanding international and domestic markets, and to hone their leadership and management skills. As these transitions have occurred, they have drawn on the programs of the North Dakota Agricultural Experiment Station (ND AES) and NDSU Extension Service as major sources for innovation, new tools, new knowledge and support. Examples of recent contributions in the areas of global food security, climate change, sustainable energy, food safety, childhood obesity, and citizen and leadership development follow.

Global Food Security

NDSU crop breeders continue to develop and release new crop varieties to bolster profits and give producers more opportunities to compete in a global market. Tioga is a new durum variety that is well-adapted to the entire durum-producing region of the state. It has shown excellent yield potential, as well as very good yield stability, and has very good test weight. NDSU cereal chemists have given Tioga a quality rating of excellent based on agronomic, milling and spaghetti processing performance. Decade hard red winter wheat is a cooperative release by Montana State University and the ND AES. Decade is very high yielding and has winter hardiness to survive the harsh conditions of western North Dakota and eastern Montana. Decade also has excellent milling and baking qualities. ND1005T is a specialty soybean release for the food-grade soybean and tofu industry.

North Dakota is the leading producer of dry beans in the U.S. with a value of $270 million per year. To ensure the crop continues to be successful, NDSU scientists are continually looking for additional tools to aid their efforts. The most powerful tool to come along recently is in the area of genome sequencing. NDSU scientists are collaborating to support a dry bean sequencing project by providing the DNA that is being sequenced and bioinformatics support to better understand the final sequence. The project is a collaborative effort involving research groups at NDSU, Purdue University, Hudson-Alpha Institute for Biotechnology, the Department of Energy Joint Genome Institute (DOE-JGI) and the U.S. Department of Agriculture's Agricultural Research Service Soybean Genomics and Improvement Lab. The sequence will be used to develop tools that will assist plant breeders and geneticists to improve the crop.

Researchers in NDSU's Animal Sciences Department are determining the benefits of exercise for pigs. Tests of pregnant gilts (young female swine) that were allowed to do some physical activity spent more time on their feet than gilts that didn't have opportunities to exercise, which could indicate the gilts that exercised were more comfortable standing and less likely to have sore feet and legs. Researchers learned the exercise also impacted the offspring. For instance, blood flow from the mother to her babies during pregnancy was greater in gilts that exercised. Plus, the reproductive organs of females born to gilts that got exercise were heavier. This could be linked to greater fertility in those females. In addition, the study indicated that the mothers' exercise could have a positive impact on their offspring's muscle development, which could translate into leaner cuts of meat at the grocery store.

Climate Change

North Dakota producers coped with weather extremes in 2009-10 with NDSU's help. A wet spring delayed planting in 2009. Wet conditions later in the summer put harvesting behind schedule and caused mold to grow on corn in the field. Heavy snowfall and a fast snowmelt in spring 2010 led to flooding primarily in the Red River Valley for the second year in a row, and some parts of the state experienced excessive rainfall, which caused problems for producers. Throughout the 2009 and 2010 growing seasons, Extension specialists held weekly crop conference calls to provide county Extension agents with information they could use to help producers. The specialists also developed publications, fact sheets and other educational material with information and options for producers, and updated NDSU's flood information website. To combat the corn problems in 2009, the NDSU Plant Diagnostic Laboratory tested moldy corn to identify the mold type and check for toxins. Extension specialists led informational meetings with representatives of agencies and organizations affected by moldy corn and discolored kernels. Extension specialists and agents provided producers with information on drying and storing grain.

North Dakota's old nitrogen recommendations for spring and durum wheat were developed during the 1960s and early 1970s. The NDSU Extension Service released new recommendations for 2010, which are based on the 'return to nitrogen' concept that considers the relationship of wheat yield to nitrogen rate, soil test nitrogen, credits from previous crops, the relationship of wheat grain protein to nitrogen rate, and the cost of nitrogen. With the new recommendations, higher nitrogen rates are recommended to increase profits when wheat prices are high or nitrogen costs are low. It is projected that about half of North Dakota's wheat growers use the new recommendations, resulting in about 10% more yield and 1% more protein than they would have otherwise. Under this scenario, the annual net benefit should total about $148M.

Sustainable Energy

Five NDSU Research Extension Centers are finding that tall wheatgrass is emerging as the best perennial grass to grow under dryland conditions in western North Dakota for biofuel production out of 10 cool- and warm-season perennial grasses and grass mixtures. The grasses also are being tested under dryland and irrigated conditions. Tall wheatgrass and grass mixtures containing tall wheatgrass appear to have the highest concentrations of cellulose and lowest concentrations of lignin, which make them idea for ethanol production from fermentation. Tall wheatgrass seems to have low ash content as well, which makes it good for ethanol production through direct combustion.

NDSU and USDA/ARS have partnered to establish the first dedicated biomass testing laboratory in North Dakota. The lab will allow feed stocks to be evaluated for both energy content and densification for shipping. Information on the physical properties of biomass will also help the industry design optimal equipment. Biomass product characteristics will be important in developing new market standards and grades, which in turn will facilitate commercialization. Information on biomass densification will aid in planning for infrastructure and roads that may be needed to support the industry.

Food Safety

The growing popularity of gardening is rekindling interest in home canning. Processing home-canned food improperly can lead to botulism, a potentially deadly form of food poisoning. To dispel myths about food preservation and provide home canners with information on the latest food preservation, Extension educators presented "Food Preservation: It's Not Like Grandma Used to Do." The program's five lessons reached more than 300 people in Morton, Oliver and Burleigh counties in 2010. Eighty-seven percent of the participants said after the program that they plan to follow recommendations in NDSU Extension material when canning, and 80 percent said they plan to use a research-tested recipe.

Childhood Obesity

Childhood obesity has more than tripled in the U.S. in the last 30 years. Obese children face a higher risk of cardiovascular disease, diabetes, strokes, cancer and osteoarthritis. To combat this trend, the

NDSU Extension Service developed "On the Move to Better Health," a five-week, school-based program for fifth-graders. The program curriculum aims to increase the amounts of fruits, vegetables and calcium-rich foods in children's diets and improve their fitness habits. Parents receive newsletters and participate in goal-setting and other family-based activities to help children reach those goals. Of the children completing the program: 63% reported increasing their daily amount of physical activity; 58% reported drinking less soda; 55% reported increasing the amount of fruits and vegetables they eat; 54% reported drinking more milk and eating more dairy products; and 54% reported choosing more healthful snacks

Citizenship and Leadership Development

North Dakota youth joined millions of young people nationwide in learning about water and why water quality is important. They became scientists for the third annual 4-H National Youth Science Day experiment called 4-H20. The experiment demonstrated the powerful effects of carbon dioxide on aquatic animals, plants and other living organisms in streams, rivers, lakes and oceans. Youth learned about key characteristics they can use to observe water quality, such as color and odor. They discovered how higher levels of carbon dioxide result in warmer air temperatures, which, in turn, cause increased levels of algae growth in lakes and other water bodies, leading to changes in water quality. They also learned how to calculate the amount of carbon dioxide a family contributes to the atmosphere. These activities are intended to spark an interest in science in youth.

NDSU's program on high school-to-college transition has helped North Dakota students have a better idea of how to handle the often rocky switch from high school to college. During the 2009-10 school year, 853 high school seniors and 250 parents attended a program called "Are You Ready? The College Transition." The NDSU Center for 4-H Youth Development collaborated with other agencies to offer the program at 15 sites throughout North Dakota. Seniors and their parents learned how to manage the normal conflicts that result from the high school-to-college transition, increase their communication skills and create a plan for students to use when faced with conflicts or issues. Students also received advice on financial planning, diversity, making healthy choices, stress, personal safety, alcohol and drugs, and how to be successful academically. Easing that transition from high school to college is important because today's high school seniors are at risk for a number of mental and physical health problems when they enter college, including binge drinking, depression and suicide.

The Horizons program has armed 15 more North Dakota communities with strategies to combat challenges such as poverty, a declining economy and loss of residents. With help from Horizons, a partnership between the NDSU Extension Service and the Northwest Area Foundation, residents of 15 towns spent 18 months in 2009-10 exploring their perceptions about poverty. They also completed a leadership development course, developed a vision and strategic plan for their community and put parts of these plans into action. Some of the results of their efforts include: Fessenden has a new café and a pet-grooming service; Leeds revived its adult education classes, established a preschool program and refurbished the community swimming pool; McClusky's shut-ins can get hot meals delivered to them; Napoleon has a new drug store and café; Tolna created a fishing area north of town, which led to the development of a camping area and a bait shop opening.

Total Actual Amount of professional FTEs/SYs for this State

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Plan	85.0	0.0	50.0	0.0
Actual	75.0	0.0	36.0	0.0

II. Merit Review Process

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

- ☑ Internal University Panel
- ☑ External University Panel
- ☐ External Non-University Panel
- ☑ Combined External and Internal University Panel
- ☐ Combined External and Internal University External Non-University Panel
- ☑ Expert Peer Review
- ☐ Other

2. Brief Explanation

Research programs were subjected to reviews prior to, during and at the conclusion of each research project. Research faculty who participate in multi state research projects received a critical review of their contributing project from fellow committee members, the administrative adviser and the North Central Multi State Research Committee. Many faculty have competitive grants which are awarded on the basis of scientific merit and have an external peer review. Each research faculty member with the North Dakota Agricultural Experiment Station was required to have a station project that was reviewed for scientific merit by a Project Review Committee that is comprised of one faculty member from each discipline. All research was peer reviewed, either internally or externally, prior to publication.

Programs of state Extension specialists are evaluated within their home departments and by program leaders. Programs of area Extension specialists are evaluated by their Research Extension Center directors and by program leaders. Multiple specialists receive federal, state, agency or commodity competitive funding for projects which involves external reviews. Several specialists also convene formal advisory boards which includes program evaluations. All Extension bulletins are peer reviewed internally and external reviewers are frequently solicited.

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 groups
- ☑ Survey of traditional stakeholder individuals
- ☐ Survey of the general public
- ☑ Survey specifically with non-traditional groups
- ☐ Survey specifically with non-traditional individuals

- ☐ Survey of selected individuals from the general public
- ☐ Other

Brief explanation.

Establishing linkages with the public enables us to discover information about community/county/district/state assets and needs. Methods such as holding public meetings or listening sessions, using targeted invitations, and surveys are used for stakeholder input on an on going basis. Using several methods to collect data ensure that high priority issues are identified, people that have a self interest in the issue are brought to the planning meetings, and an educational design is developed to address the issue using a variety of delivery methods. A tool that is being used more extensively is the turning point technology. It has been used in the classroom for some time, but has a great utilization for the public to express their concerns anonymously in public forums or gatherings.

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 Internal Focus Groups
- ☑ Use External Focus Groups
- ☑ Open Listening Sessions
- ☑ Needs Assessments
- ☑ Use Surveys
- ☐ Other

Brief explanation.

The State Board for Agricultural Research and Education (SBARE) is charged with determining the causes of any adverse economic impacts on crops and livestock produced in this state; developing ongoing strategies for the provision of research solutions to negate adverse economic impacts on crops and livestock produced in this state; developing ongoing strategies for the dissemination of research information through the Extension Service; annually evaluating the results of research and extension activities and expenditures; and reporting the findings to the North Dakota Legislative Council and the State Board of Higher Education.

County commissioners actively participate in county extension program reviews. The county extension budgeting process also results in strong engagement from county government.

The North Dakota Department of Human Services and NDSU Extension Service formed a statewide Family Life Education Committee. The committee is composed of state legislators, an Extension specialist, an Extension Human Development Agent, citizens with a parenting self interest, two administrators from the Child Division of the State Department of Human Services and the Extension Assistant Director, Nutrition, Youth and Family Science. As a result of this partnership, the state Department of Human Services provides funding opportunities to six state family life education centers through a request for proposal process. The availability of designated funds also directs the focus of the parenting education programs provided through the six family life education center coordinators.

The ND Department of Health, under the direction of the Governor of North Dakota, formed an alliance of organizations in ND that provide significant support and leadership for health related initiatives. NDSU Extension is represented on this coalition. Networking among these professionals

is invaluable, in addition to the legislative work.

A number of government and non governmental units have formed a coalition to address the financial needs of North Dakotans. Saving more and reducing credit card debt are two of the key issues being addressed. NDSU Extension is a part of the team.

The Rural Leadership ND Council serves as a stakeholder advisory board of agricultural, business, public, and non-profit entities to provide program review and assessment of current needs related to rural community development issues. Council membership is based on a nomination process.

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
- ☑ Survey of traditional Stakeholder groups
- ☑ Meeting with traditional Stakeholder individuals
- ☑ Survey of traditional Stakeholder individuals
- ☐ Meeting with the general public (open meeting advertised to all)
- ☐ Survey of the general public
- ☐ Meeting specifically with non-traditional groups
- ☐ Survey specifically with non-traditional groups
- ☐ Meeting specifically with non-traditional individuals
- ☐ Survey specifically with non-traditional individuals
- ☐ Meeting with invited selected individuals from the general public
- ☐ Survey of selected individuals from the general public
- ☐ Other

Brief explanation.

The State Board for Agricultural Research and Education (SBARE) meets bimonthly. Both the Extension Service and the Experiment Station are represented on the board, affording opportunities for input and program directions.

County commissioners are met with at least once a year and in most cases twice for input.

The statewide Family Life Education Committee meets quarterly where input is sought for programming and direction.

The Rural Leadership ND Council serves as a stakeholder advisory board and meets two to three times per year to help guide Extension program directions.

3. A statement of how the input will be 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
- ☐ Other

Brief explanation.

The State Board for Agricultural Research and Education (SBARE) is charged with developing ongoing strategies for the dissemination of research information through the Extension Service; annually evaluating the results of research and extension activities and expenditures; and reporting the findings to the North Dakota Legislative Council and the State Board of Higher Education. Their findings directly affect the budgeting process.

The staff from the seven research extension centers (RECs) uses the input from winter meetings with their advisory boards to set program direction for their center.

During county staff evaluations each year, programming input is gathered from commissioners who take part in the staff evaluations. This arrangement helps assure that extension programs are grass roots driven and are focused on local issues and needs.

The statewide Family Life Education Committee, composed of state legislators, an Extension specialist, an Extension Human Development Agent, citizens with a parenting self interest, two administrators from the Child Division of the State Department of Human Services and the Extension Assistant Director, Nutrition, Youth and Family Science determine the availability of designated funds which direct the focus of the parenting education programs provided through the six family life education center coordinators. The six family life education coordinators provide evaluation feedback to the Family Life Education Committee of the state Department of Human Services on program impacts. These impacts are then shared with state legislators which in turn affect budgeting.

The Rural Leadership ND Council has identified building capacity of leadership at both the rural agricultural level and business level as priorities for current Extension programs.

Brief Explanation of what you learned from your Stakeholders

The State Board for Agricultural Research and Education (SBARE) ranked 10 program and infrastructure needs for both the the ND AES and NDSU Extension Service for legislative consideration. Research needs (excluding infrastructure needs) identified for North Dakota were 1) enhancing soil productivity and land management with special focus on saline/sodic soils; 2) enhancing crop development efforts, including canola breeding and support of the weather monitoring system for disease forecasts; 3) improving animal productivity and livestock stewardship; 4) crop commodity quality/trait and ulitization development; 5) improving animal health care; 6) plant pathology for sunflowers; 7) enhanced support of the state data center; and 8) increased research on organic/sustainable agricultural systems.

Extension needs (excluding infrastructure needs) were identified in the areas of 1) soil health and land management; 2) livestock stewardship; 3) crop protection from pests; 4) agricultural entrepeneurship and rural business transition; 5) early childhood education and parenting; and 6) identity-preserved and specialty agriculture. Expanded descriptions of these priorties are posted at http://www.ag.ndsu.edu/sbare/Priorities-9-10.pdf.

IV. Expenditure Summary

1. Total Actual Formula dollars Allocated (prepopulated from C-REEMS)			
Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
3330690	0	2683464	0

2. Totaled Actual dollars from Planned Programs Inputs				
	Extension		Research	
	Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
Actual Formula	2304000	0	1356400	0
Actual Matching	3456000	0	2034000	0
Actual All Other	0	0	0	0
Total Actual Expended	5760000	0	3390400	0

3. Amount of Above Actual Formula Dollars Expended which comes from Carryover funds from previous				
Carryover	0	0	0	0

V. Planned Program Table of Content

S. No.	PROGRAM NAME
1	Energy in Crop Agriculture
2	Economics of Crop Production
3	Global Food Security and Hunger
4	Weed Science
5	Climate Change - Soil Science
6	Sustainable Energy
7	Climate Change - Insect Management
8	Center for Nutrition and Pregnancy
9	Nutrition of Grazing Livestock
10	Food Safety
11	Childhood Obesity
12	Livestock Waste Management
13	Citizenship and Leadership Development
14	Developing Leadership Systems
15	Financial Security for All
16	Noxious and Invasive Weed Management
17	Fusarium head blight of wheat
18	Family Meals
19	Parent Education - Parents Forever

Add previously unplanned program

V(A). Planned Program (Summary)

Program # 1

1. Name of the Planned Program

Energy in Crop Agriculture

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
205	Plant Management Systems	50%		0%	
402	Engineering Systems and Equipment	35%		0%	
404	Instrumentation and Control Systems	15%		0%	
	Total	100%		0%	

Add knowledge area

V(C). Planned Program (Inputs)

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

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Plan	10.0	0.0	0.0	0.0
Actual	10.0	0.0	0.0	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**
320000	0	0	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
480000	0	0	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

* Develop presentation materials and develop resource materials

* Develop and plan workshops, demonstrations and meetings
* Transcribe scientific research into useable resources
* Continuing education demonstrations - fuel use, tillage and N use
* Cooperate with NDSU Research Extension Centers - conduct rate N calibrations and tillage fuel use studies

2. Brief description of the target audience

* Extension staff
* Crop consultants
* Agricultural industry personnel
* Agricultural finance people
* Government workers
* Growers

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	3000	8000	0	0
Actual	3250	15000	0	0

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

Patent Applications Submitted

Year: 2010
Plan: 0
Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Plan	1	0	
Actual	8	0	8

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- {No Data Entered}

Not reporting on this Output for this Annual Report

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of farmers gaining knowledge on new tillage options
2	Number of farmers gaining knowledge of energy alternatives
3	Number of farmers gaining knowledge of energy potential and availability of different crops
4	Number of farmers that changed their tillage habits to no-till
5	Number of farmers that make greater use of soil testing for fertilizer needs
6	Number of acres under reduced tillage
7	Number of farmers using reduced energy technologies
8	Percent reduction in energy use for drying corn after growers adopted energy efficient corn grain drying practices.

Add Cross-cutting Outcome/Impact Statement or Unintended or Previously Unknown Outcome Measure

Outcome #1

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Number of farmers gaining knowledge on new tillage options

2. Associated Institution Types

☑ 1862 Extension
☐ 1862 Research

3a. Outcome Type:

◉ Change in Knowledge Outcome Measure
◯ Change in Action Outcome Measure
◯ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	500	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

☑ 205 - Plant Management Systems
☑ 402 - Engineering Systems and Equipment
☑ 404 - Instrumentation and Control Systems

Outcome #2

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Number of farmers gaining knowledge of energy alternatives

2. Associated Institution Types

- ☑ 1862 Extension
- ☐ 1862 Research

3a. Outcome Type:

- ◉ Change in Knowledge Outcome Measure
- ◯ Change in Action Outcome Measure
- ◯ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	750	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- ☑ 205 - Plant Management Systems
- ☑ 402 - Engineering Systems and Equipment
- ☐ 404 - Instrumentation and Control Systems

Outcome #3

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Number of farmers gaining knowledge of energy potential and availability of different crops

2. Associated Institution Types

- ☑ 1862 Extension
- ☐ 1862 Research

3a. Outcome Type:

- ◉ Change in Knowledge Outcome Measure
- ◯ Change in Action Outcome Measure
- ◯ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	500	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- ☑ 205 - Plant Management Systems
- ☐ 402 - Engineering Systems and Equipment
- ☐ 404 - Instrumentation and Control Systems

Outcome #4

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Number of farmers that changed their tillage habits to no-till

2. Associated Institution Types

- ☑ 1862 Extension
- ☐ 1862 Research

3a. Outcome Type:

- ○ Change in Knowledge Outcome Measure
- ◉ Change in Action Outcome Measure
- ○ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	30	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- ☑ 205 - Plant Management Systems
- ☑ 402 - Engineering Systems and Equipment
- ☑ 404 - Instrumentation and Control Systems

Outcome #5

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Number of farmers that make greater use of soil testing for fertilizer needs

2. Associated Institution Types

- ☑ 1862 Extension
- ☐ 1862 Research

3a. Outcome Type:

- ○ Change in Knowledge Outcome Measure
- ◉ Change in Action Outcome Measure
- ○ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	200	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- ☑ 205 - Plant Management Systems
- ☐ 402 - Engineering Systems and Equipment
- ☐ 404 - Instrumentation and Control Systems

Outcome #6

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Number of acres under reduced tillage

2. Associated Institution Types

☑ 1862 Extension
☐ 1862 Research

3a. Outcome Type:

○ Change in Knowledge Outcome Measure
◉ Change in Action Outcome Measure
○ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	200000	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

☑ 205 - Plant Management Systems
☑ 402 - Engineering Systems and Equipment
☑ 404 - Instrumentation and Control Systems

Outcome #7

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Number of farmers using reduced energy technologies

2. Associated Institution Types

- ☑ 1862 Extension
- ☐ 1862 Research

3a. Outcome Type:

- ◯ Change in Knowledge Outcome Measure
- ◉ Change in Action Outcome Measure
- ◯ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	500	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- ☑ 205 - Plant Management Systems
- ☑ 402 - Engineering Systems and Equipment
- ☑ 404 - Instrumentation and Control Systems

Outcome #8

1. Outcome Measures

☐ Not Reporting on this Outcome Measure

Percent reduction in energy use for drying corn after growers adopted energy efficient corn grain drying practices.

2. Associated Institution Types

- ☑ 1862 Extension
- ☐ 1862 Research

3a. Outcome Type:

- ◯ Change in Knowledge Outcome Measure
- ◉ Change in Action Outcome Measure
- ◯ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	20

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
North Dakota corn production is about 248 million bushels from about 2 million acres. Farmers are seeking assistance in selecting grain dryers and drying methods that reduce the cost of drying corn. About 13,000 Btu are required to dry corn from a typical harvest moisture content of 21% to a typical storage/market moisture content of 14%. A savings of about 2600 BTUs per bushel, a 20% savings, is expected if energy efficient methods of drying are used rather than inefficient methods. This is an energy savings of about 8 million gallons of propane with a value of about $12 million.

What has been done
Several grain drying seminars with a focus on energy efficiency were conducted. News releases, magazine articles, and media interviews were used to educate farmers and others purchasing and operating drying systems. Educational material was developed and placed on the web at http://www.ag.ndsu.edu/extension-aben/post-harvest. A 4-hour training session was presented for equipment retailers, utility personnel, professional engineers and others working with farmers on how to conduct a grain dryer energy audit. Individual education and assistance on selecting proper equipment to obtain an energy efficient drying system was provided to about 300 people through telephone and electronic consultations. In addition to grain drying, seven other farm energy efficiency guides from NDSU Extension Service were also contributed to the eXtension Farm Energy CoP at http://www.extension.org/pages/31201/farm-energy-efficiency-checklist-and-tips.

Results
Energy audits conducted for farmers applying for USDA REAP grants show a 25% to 30% reduction in energy cost for farmers changing to more efficient corn dryers and systems. Even farmers adopting more energy efficient practices using existing dryers experience a 10% to 20% decrease in energy consumption. Grain drying educational programs reached 950 growers and consultants in 2010. For farmers drying 200,000 bushels of corn, a 20% savings is equivalent to 7,850 gallons of propane with a value of $11,775 at a propane price of $1.50 per gallon.

4. Associated Knowledge Areas

- ☑ 205 - Plant Management Systems
- ☑ 402 - Engineering Systems and Equipment
- ☑ 404 - Instrumentation and Control Systems

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
- ☐ Competing Programmatic Challenges
- ☐ Populations changes (immigration, new cultural groupings, etc.)
- ☐ Other

Brief Explanation

Extremely wet and cool fall weather in 2009 greatly increased the need for corn drying and increased the interest for programming on grain drying. Increased fuel costs also increased the interest in high efficiency dryers.

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

(OPTIONAL SECTION)

1. Evaluation Studies Planned

- ☑ After Only (post program)
- ☐ Retrospective (post program)
- ☐ Before-After (before and after program)
- ☐ During (during program)
- ☐ Time series (multiple points before and after program)
- ☐ Case Study
- ☐ Comparisons between program participants (individuals, group, organizations) and non-participants
- ☐ Comparisons between different groups of individuals or program participants experiencing different levels of program intensity.
- ☐ Comparison between locales where the program operates and sites without program intervention
- ☐ Other

Evaluation Results

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 2

1. Name of the Planned Program

Economics of Crop Production

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
601	Economics of Agricultural Production and Farm Management	25%		0%	
602	Business Management, Finance, and Taxation	25%		0%	
603	Market Economics	25%		0%	
604	Marketing and Distribution Practices	25%		0%	
	Total	100%		0%	

Add knowledge area

V(C). Planned Program (Inputs)

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

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Plan	9.0	0.0	0.0	0.0
Actual	9.0	0.0	0.0	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**
288000	0	0	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
432000	0	0	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

•Identify emerging issue.
•Provide enterprise budgets, resource use alternatives, crop insurance options, marketing strategies and other resource material reflecting best management practices.
•Evaluate effectiveness of alternative management practices.
•Develop presentation materials.
•Offer in-service education, presentations and workshops.

2. Brief description of the target audience

•Owners, managers and employees of farm operations
•Marketing club members and facilitators
•Agribusiness and government agency personnel

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	5000	250000	0	0
Actual	12048	300000	400	1000

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

Patent Applications Submitted

Year: 2010
Plan: 0
Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Plan	10	1	
Actual	16	5	21

V(F). State Defined Outputs

Output Target

<u>Output #1</u>

Output Measure

- {No Data Entered}

Not reporting on this Output for this Annual Report

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of producers and others attending workshops, marketing clubs and other events.
2	Number of participants demonstrating an increase in subject knowledge and skills.
3	Evidence of producers employing enterprise budgets, using computerized decision-making tools, writing marketing plans and adopting recommended management tools.
4	Number of marketing clubs in the state.
5	Evidence of producers having a more productive working relationship with agriculture service personnel.
6	Evidence of producers implementing activities indicated by the management tools.
7	Evidence of benefits from marketing club participation and best management practice implementation.
8	Estimated value of adopted best management practices to the individual and to the state.
9	Number of families of North Dakota farms and ranches who received information to develop plans for intergenerational transfer of farm assets.

Add Cross-cutting Outcome/Impact Statement or Unintended or Previously Unknown Outcome Measure

Outcome #1

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Number of producers and others attending workshops, marketing clubs and other events.

2. Associated Institution Types

☑ 1862 Extension
☐ 1862 Research

3a. Outcome Type:

◉ Change in Knowledge Outcome Measure
◯ Change in Action Outcome Measure
◯ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	5000	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

☑ 601 - Economics of Agricultural Production and Farm Management
☑ 602 - Business Management, Finance, and Taxation
☑ 603 - Market Economics
☑ 604 - Marketing and Distribution Practices

Outcome #2

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Number of participants demonstrating an increase in subject knowledge and skills.

2. Associated Institution Types

- ☑ 1862 Extension
- ☐ 1862 Research

3a. Outcome Type:

- ◉ Change in Knowledge Outcome Measure
- ◯ Change in Action Outcome Measure
- ◯ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	2500	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- ☑ 601 - Economics of Agricultural Production and Farm Management
- ☑ 602 - Business Management, Finance, and Taxation
- ☑ 603 - Market Economics
- ☑ 604 - Marketing and Distribution Practices

Outcome #3

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Evidence of producers employing enterprise budgets, using computerized decision-making tools, writing marketing plans and adopting recommended management tools.

2. Associated Institution Types

- ☑ 1862 Extension
- ☐ 1862 Research

3a. Outcome Type:

- ◯ Change in Knowledge Outcome Measure
- ◉ Change in Action Outcome Measure
- ◯ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	15000	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- ☑ 601 - Economics of Agricultural Production and Farm Management
- ☑ 602 - Business Management, Finance, and Taxation
- ☑ 603 - Market Economics
- ☑ 604 - Marketing and Distribution Practices

Outcome #4

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Number of marketing clubs in the state.

2. Associated Institution Types

- ☑ 1862 Extension
- ☐ 1862 Research

3a. Outcome Type:

- ○ Change in Knowledge Outcome Measure
- ◉ Change in Action Outcome Measure
- ○ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	50	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- ☐ 601 - Economics of Agricultural Production and Farm Management
- ☐ 602 - Business Management, Finance, and Taxation
- ☑ 603 - Market Economics
- ☐ 604 - Marketing and Distribution Practices

Outcome #5

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Evidence of producers having a more productive working relationship with agriculture service personnel.

2. Associated Institution Types

- ☑ 1862 Extension
- ☐ 1862 Research

3a. Outcome Type:

- ○ Change in Knowledge Outcome Measure
- ◉ Change in Action Outcome Measure
- ○ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	10000	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- ☑ 601 - Economics of Agricultural Production and Farm Management
- ☑ 602 - Business Management, Finance, and Taxation
- ☑ 603 - Market Economics
- ☑ 604 - Marketing and Distribution Practices

Outcome #6

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Evidence of producers implementing activities indicated by the management tools.

2. Associated Institution Types

☑ 1862 Extension
☐ 1862 Research

3a. Outcome Type:

◯ Change in Knowledge Outcome Measure
◯ Change in Action Outcome Measure
◉ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	7500	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

☑ 601 - Economics of Agricultural Production and Farm Management
☑ 602 - Business Management, Finance, and Taxation
☑ 603 - Market Economics
☑ 604 - Marketing and Distribution Practices

Outcome #7

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Evidence of benefits from marketing club participation and best management practice implementation.

2. Associated Institution Types

- ☑ 1862 Extension
- ☐ 1862 Research

3a. Outcome Type:

- ○ Change in Knowledge Outcome Measure
- ○ Change in Action Outcome Measure
- ◉ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	90000000	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- ☑ 601 - Economics of Agricultural Production and Farm Management
- ☑ 602 - Business Management, Finance, and Taxation
- ☑ 603 - Market Economics
- ☑ 604 - Marketing and Distribution Practices

Outcome #8

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Estimated value of adopted best management practices to the individual and to the state.

2. Associated Institution Types

- ☑ 1862 Extension
- ☐ 1862 Research

3a. Outcome Type:

- ○ Change in Knowledge Outcome Measure
- ○ Change in Action Outcome Measure
- ◉ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	90000000	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- ☑ 601 - Economics of Agricultural Production and Farm Management
- ☑ 602 - Business Management, Finance, and Taxation
- ☑ 603 - Market Economics
- ☑ 604 - Marketing and Distribution Practices

Outcome #9

1. Outcome Measures

☐ Not Reporting on this Outcome Measure

Number of families of North Dakota farms and ranches who received information to develop plans for intergenerational transfer of farm assets.

2. Associated Institution Types

- ☑ 1862 Extension
- ☐ 1862 Research

3a. Outcome Type:

- ◉ Change in Knowledge Outcome Measure
- ◯ Change in Action Outcome Measure
- ◯ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	500

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The increasing financial size of North Dakota farms and ranches and the increasing average age of owners have heightened the importance for developing plans for intergenerational transfer of assets. Farm and ranch transition and estate planning has also been one of the top topics requested by agricultural producers in recent Extension surveys. Follow-up surveys identified that

many farm and ranch owners do not even have a will. Several indicated that they do not know where to start or where to go to begin the estate planning process. Others indicated that at meetings they have attended in the private sector, there was more pressure to buy life insurance or long-term-care insurance than to plan the intergenerational transfer. These farm families need unbiased educational programs in estate planning.

What has been done
A statewide steering committee was formed to develop a Farm and Ranch Transition and Estate Planning program. A three-session educational series was developed and delivered at 17 locations throughout North Dakota. Each session was 3 hours long and was delivered by both interactive video and local presenters including University professors, Extension specialists, attorneys, and Extension agents. Topics included importance of family communication, transition planning, business organization forms, asset transfer options, tax implications, power of attorney and probate. Attendees were introduced to several on-line transition planning tools.

Results
Over 500 individuals, including couples and families, participated in the Farm and Ranch Transition and Estate Planning program, which will be continued in 2011. Some of the measured impacts included: 98 percent of the respondents stated that the information was very valuable to them; 95 percent increased their confidence in developing or improving an existing estate plan; 88 percent increased their knowledge regarding how to communicate with family members about estate planning; and 70 percent improved their understanding of the tax consequences of transferring assets. These training sessions provided valuable knowledge and tools to the participants. One couple stated on their evaluation, "These sessions gave us the motivation we needed as a couple to get the process started." Another participant stated the most useful part of the program was learning the "methods of holding assets and transferring them to heirs with minimal tax and loss in value."

4. Associated Knowledge Areas

- ☑ 601 - Economics of Agricultural Production and Farm Management
- ☑ 602 - Business Management, Finance, and Taxation
- ☐ 603 - Market Economics
- ☐ 604 - Marketing and Distribution Practices

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
- ☐ Competing Programmatic Challenges
- ☐ Populations changes (immigration, new cultural groupings, etc.)
- ☐ Other

Brief Explanation

Worldwide weather, political unrest, and economic challenges caused rapidly changing supply and demand conditions for all agricultural commodities. Just a few of many examples include drought in the Black Sea region, political demonstrations in Africa, and a rapidly increasing middle class in China. The food versus fuel debate caused public policy debate in many countries including the U.S. Changes in U.S. public policy on estate tax provisions and the increasing age of agricultural producers were also important issues.

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

(OPTIONAL SECTION)

1. Evaluation Studies Planned

- ☑ After Only (post program)
- ☐ Retrospective (post program)
- ☐ Before-After (before and after program)
- ☐ During (during program)
- ☐ Time series (multiple points before and after program)
- ☐ Case Study
- ☐ Comparisons between program participants (individuals, group, organizations) and non-participants
- ☐ Comparisons between different groups of individuals or program participants experiencing different levels of program intensity.
- ☐ Comparison between locales where the program operates and sites without program intervention
- ☐ Other

Evaluation Results

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 3

1. Name of the Planned Program

Global Food Security and Hunger

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
202	Plant Genetic Resources	0%		25%	
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants	0%		25%	
204	Plant Product Quality and Utility (Preharvest)	0%		5%	
211	Insects, Mites, and Other Arthropods Affecting Plants	0%		5%	
212	Pathogens and Nematodes Affecting Plants	0%		40%	
	Total	0%		100%	

Add knowledge area

V(C). Planned Program (Inputs)

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

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	13.0	0.0
Actual	0.0	0.0	13.0	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**
0	0	490100	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
0	0	734500	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

- Develop improved cultivars and inbreds
- Evaluate elites lines from other breeding programs
- Develop resource material
- Identify emerging issues
- Evaluate effectiveness of activities

2. Brief description of the target audience

- Producers
- Processors that utilize the grain
- Crop consultants
- Local and regional commodity groups
- Personnel in agribusiness/agrifinance
- Personnel working for government agencies

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	0	0	0	0
Actual	1000	15000	0	0

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

Patent Applications Submitted

Year: 2010
Plan: 0
Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Plan	0	25	
Actual	0	27	27

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- {No Data Entered}

Not reporting on this Output for this Annual Report

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Estimated dollar value new cultivars bring to North Dakota
2	Percent of acreage that our cultivar releases occupy for each of the crops we breed
3	Changes in breeding priorities that match needs
4	Addition of new breeding programs or addition of responsibilities to existing programs
5	Number of teams working together to develop genetic solutions
6	Number of individuals growing improved cultivars
7	Number of other breeding programs using NDSU developed germplasm
8	Percent of acres planted to new NDSU-developed durum wheat cultivars by ND growers.
9	Percent of acres planted to NDSU-developed hard red spring varieties by ND growers.

Add Cross-cutting Outcome/Impact Statement or Unintended or Previously Unknown Outcome Measure

Outcome #1

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Estimated dollar value new cultivars bring to North Dakota

2. Associated Institution Types

☐ 1862 Extension
☑ 1862 Research

3a. Outcome Type:

○ Change in Knowledge Outcome Measure
○ Change in Action Outcome Measure
◉ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	35000000	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

☑ 202 - Plant Genetic Resources
☑ 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
☑ 204 - Plant Product Quality and Utility (Preharvest)
☑ 211 - Insects, Mites, and Other Arthropods Affecting Plants
☑ 212 - Pathogens and Nematodes Affecting Plants

Outcome #2

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Percent of acreage that our cultivar releases occupy for each of the crops we breed

2. Associated Institution Types

- ☐ 1862 Extension
- ☑ 1862 Research

3a. Outcome Type:

- ○ Change in Knowledge Outcome Measure
- ○ Change in Action Outcome Measure
- ◉ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	45	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- ☑ 202 - Plant Genetic Resources
- ☑ 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- ☑ 204 - Plant Product Quality and Utility (Preharvest)
- ☑ 211 - Insects, Mites, and Other Arthropods Affecting Plants
- ☑ 212 - Pathogens and Nematodes Affecting Plants

Outcome #3

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Changes in breeding priorities that match needs

2. Associated Institution Types

- ☐ 1862 Extension
- ☑ 1862 Research

3a. Outcome Type:

- ◉ Change in Knowledge Outcome Measure
- ◯ Change in Action Outcome Measure
- ◯ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- ☑ 202 - Plant Genetic Resources
- ☑ 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- ☑ 204 - Plant Product Quality and Utility (Preharvest)
- ☑ 211 - Insects, Mites, and Other Arthropods Affecting Plants
- ☑ 212 - Pathogens and Nematodes Affecting Plants

Outcome #4

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Addition of new breeding programs or addition of responsibilities to existing programs

2. Associated Institution Types

- ☐ 1862 Extension
- ☑ 1862 Research

3a. Outcome Type:

- ◉ Change in Knowledge Outcome Measure
- ◯ Change in Action Outcome Measure
- ◯ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- ☑ 202 - Plant Genetic Resources
- ☐ 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- ☐ 204 - Plant Product Quality and Utility (Preharvest)
- ☐ 211 - Insects, Mites, and Other Arthropods Affecting Plants
- ☑ 212 - Pathogens and Nematodes Affecting Plants

Outcome #5

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Number of teams working together to develop genetic solutions

2. Associated Institution Types

- ☐ 1862 Extension
- ☑ 1862 Research

3a. Outcome Type:

- ◉ Change in Knowledge Outcome Measure
- ◯ Change in Action Outcome Measure
- ◯ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	7	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- ☑ 202 - Plant Genetic Resources
- ☑ 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- ☑ 204 - Plant Product Quality and Utility (Preharvest)
- ☑ 211 - Insects, Mites, and Other Arthropods Affecting Plants
- ☑ 212 - Pathogens and Nematodes Affecting Plants

Outcome #6

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Number of individuals growing improved cultivars

2. Associated Institution Types

- ☐ 1862 Extension
- ☑ 1862 Research

3a. Outcome Type:

- ○ Change in Knowledge Outcome Measure
- ◉ Change in Action Outcome Measure
- ○ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	15000	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- ☑ 202 - Plant Genetic Resources
- ☑ 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- ☑ 204 - Plant Product Quality and Utility (Preharvest)
- ☑ 211 - Insects, Mites, and Other Arthropods Affecting Plants
- ☑ 212 - Pathogens and Nematodes Affecting Plants

Outcome #7

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Number of other breeding programs using NDSU developed germplasm

2. Associated Institution Types

☐ 1862 Extension
☑ 1862 Research

3a. Outcome Type:

◯ Change in Knowledge Outcome Measure
◉ Change in Action Outcome Measure
◯ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	50	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

☑ 202 - Plant Genetic Resources
☑ 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
☑ 204 - Plant Product Quality and Utility (Preharvest)
☑ 211 - Insects, Mites, and Other Arthropods Affecting Plants
☑ 212 - Pathogens and Nematodes Affecting Plants

Outcome #8

1. Outcome Measures

☐ Not Reporting on this Outcome Measure

Percent of acres planted to new NDSU-developed durum wheat cultivars by ND growers.

2. Associated Institution Types

- ☐ 1862 Extension
- ☑ 1862 Research

3a. Outcome Type:

- ○ Change in Knowledge Outcome Measure
- ◉ Change in Action Outcome Measure
- ○ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	84

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Growers, crop consultants, end users, grain marketers seek durum varieties with increased yield with maintained or improved quality profiles. All of these individuals rely on sale of grain to maintain the profitability and sustainability of their farms or their businesses. End use quality of new varieties is needed to maintain the milling and pasta quality desired by processors and the consumer. Ultimately, wheat production needs to be increased to supply an increasing global demand for product.

What has been done
The durum wheat breeding/genetics program is developing improved durum wheat varieties acceptable to growers in North Dakota and those who use and process the grain.

Results
The NDSU durum wheat breeding/genetics program has been highly successful in developing varieties with high yield and quality for North Dakota growers. Over 80% of the durum wheat varieties grown in North Dakota were developed by NDSU breeders and include the newly released Tioga in 2010. Other recent durum releases include Divide, Alkabo, and Grenora. Divide had the highest acreage of any variety in 2010 with 27% of acres. Eight NDSU varieties account for 84% of acres planted to durum. North Dakota leads the nation in durum wheat production with 1.8 million acres harvested in 2010 for a total production of 67 million bushels. This is 62% of the total national production. This crop provided state growers with a crop valued at $390 million. It also provided the milling and food industry with a high quality ingredient for additional value.

4. Associated Knowledge Areas

- ☑ 202 - Plant Genetic Resources
- ☑ 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- ☑ 204 - Plant Product Quality and Utility (Preharvest)
- ☑ 211 - Insects, Mites, and Other Arthropods Affecting Plants
- ☑ 212 - Pathogens and Nematodes Affecting Plants

Outcome #9

1. Outcome Measures

☐ Not Reporting on this Outcome Measure

Percent of acres planted to NDSU-developed hard red spring varieties by ND growers.

2. Associated Institution Types

☐ 1862 Extension
☑ 1862 Research

3a. Outcome Type:

◯ Change in Knowledge Outcome Measure
◉ Change in Action Outcome Measure
◯ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	51

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Growers, crop consultants, end users, grain marketers seek hard red-spring wheat varieties with increased yield with maintained or improved quality profiles. All of these individuals rely on sale of grain to maintain the profitability and sustainability of their farms or their businesses. End use quality of new varieties is needed to maintain the milling and baking quality desired by processors and the consumer. Ultimately, wheat production needs to be increased to supply an increasing global demand for product.

What has been done
The hard red spring wheat breeding/genetics program is developing improved hard red wheat varieties acceptable to growers in North Dakota and those who use and process the grain.

Results
The NDSU hard red spring wheat breeding/genetics program has been highly successful in developing varieties with high yield and quality for North Dakota growers. Over 60% of the hard red spring wheat acreage grown in North Dakota were planted to cultivars developed by NDSU breeders. Glenn and Faller (2005 and 2007 NDSU releases, respectively) were the leading varieties grown in the state, occupying about 40% of North Dakota wheat acres. In total, five of the more recently released NDSU varieties (Glenn, Faller, Steele ND, Howard, and Alsen) were planted on 51% of North Dakota's hard red spring acres in 2010. North Dakota leads the nation in hard red spring wheat production. NDSU developed varieties were planted on approximately 4 million acres in 2010 for a total production of about 166 million bushels. This portion of the wheat crop provided state growers with a crop valued at over $1 billion. It also provided the milling and food industry with a high quality ingredient for additional value.

4. Associated Knowledge Areas

- ☑ 202 - Plant Genetic Resources
- ☑ 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- ☑ 204 - Plant Product Quality and Utility (Preharvest)
- ☑ 211 - Insects, Mites, and Other Arthropods Affecting Plants
- ☑ 212 - Pathogens and Nematodes Affecting Plants

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
- ☐ Competing Programmatic Challenges
- ☐ Populations changes (immigration, new cultural groupings, etc.)
- ☐ Other

Brief Explanation

Unfavorable weather conditions, including drought or excessive rain, can reduce crop yields and quality and can also damage breeding plots.

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

(OPTIONAL SECTION)

1. Evaluation Studies Planned

- ☐ After Only (post program)
- ☐ Retrospective (post program)
- ☐ Before-After (before and after program)
- ☑ During (during program)
- ☐ Time series (multiple points before and after program)
- ☐ Case Study
- ☐ Comparisons between program participants (individuals, group, organizations) and non-participants
- ☐ Comparisons between different groups of individuals or program participants experiencing different levels of program intensity.
- ☐ Comparison between locales where the program operates and sites without program intervention
- ☐ Other

Evaluation Results

Results are based on NASS survey data of North Dakota growers.

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 4

1. Name of the Planned Program

Weed Science

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
213	Weeds Affecting Plants	0%		50%	
215	Biological Control of Pests Affecting Plants	0%		20%	
216	Integrated Pest Management Systems	0%		30%	
	Total	0%		100%	

Add knowledge area

V(C). Planned Program (Inputs)

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

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	4.0	0.0
Actual	0.0	0.0	4.0	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
0	0	150800	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	226000	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

- Evaluate new herbicides, herbicide formulations, and new adjuvants
- Determine antagonisms between herbicides
- Determine better methods for applying herbicides
- Determine the prevalence of herbicide resistant weeds

2. Brief description of the target audience

- Producers
- Crop consultants
- Extension state specialists and county educators
- Commodity groups
- Personnel in agribusiness and agrifinance
- Personnel working for government agencies

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	0	0	0	0
Actual	30770	1118000	420	690

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

Patent Applications Submitted

Year: 2010
Plan: 0
Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Plan	2	5	
Actual	13	8	21

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- {No Data Entered}

Not reporting on this Output for this Annual Report

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Changes in weed science research priorities that match needs
2	Yearly updating of Weed Control Guide to reflect new herbicides and knowledge gained through research
3	Number of teams working together to develop solutions
4	Development of enhanced weed-management strategies that incorporate knowledge gained on the biology of weeds
5	Improved control of invasive perennial weeds using integrated methods
6	Delayed evolution of herbicide-resistant weeds
7	Estimated dollar value weed-control brings to North Dakota
8	Percent of producers that utilize our recommendations
9	Number of field operations that growers eliminated by using integrated weed management practices in glyphosate-resistant sugarbeets.

Add Cross-cutting Outcome/Impact Statement or Unintended or Previously Unknown Outcome Measure

Outcome #1

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Changes in weed science research priorities that match needs

2. Associated Institution Types

☐ 1862 Extension
☑ 1862 Research

3a. Outcome Type:

◉ Change in Knowledge Outcome Measure
◯ Change in Action Outcome Measure
◯ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

☑ 213 - Weeds Affecting Plants
☑ 215 - Biological Control of Pests Affecting Plants
☑ 216 - Integrated Pest Management Systems

Outcome #2

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Yearly updating of Weed Control Guide to reflect new herbicides and knowledge gained through research

2. Associated Institution Types

- ☐ 1862 Extension
- ☑ 1862 Research

3a. Outcome Type:

- ◉ Change in Knowledge Outcome Measure
- ◯ Change in Action Outcome Measure
- ◯ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	1	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- ☑ 213 - Weeds Affecting Plants
- ☑ 215 - Biological Control of Pests Affecting Plants
- ☑ 216 - Integrated Pest Management Systems

Outcome #3

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Number of teams working together to develop solutions

2. Associated Institution Types

- ☐ 1862 Extension
- ☑ 1862 Research

3a. Outcome Type:

- ◉ Change in Knowledge Outcome Measure
- ◯ Change in Action Outcome Measure
- ◯ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	3	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- ☑ 213 - Weeds Affecting Plants
- ☑ 215 - Biological Control of Pests Affecting Plants
- ☑ 216 - Integrated Pest Management Systems

Outcome #4

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Development of enhanced weed-management strategies that incorporate knowledge gained on the biology of weeds

2. Associated Institution Types

- ☐ 1862 Extension
- ☑ 1862 Research

3a. Outcome Type:

- ○ Change in Knowledge Outcome Measure
- ◉ Change in Action Outcome Measure
- ○ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	1	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- ☑ 213 - Weeds Affecting Plants
- ☑ 215 - Biological Control of Pests Affecting Plants
- ☑ 216 - Integrated Pest Management Systems

Outcome #5

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Improved control of invasive perennial weeds using integrated methods

2. Associated Institution Types

- ☐ 1862 Extension
- ☑ 1862 Research

3a. Outcome Type:

- ○ Change in Knowledge Outcome Measure
- ◉ Change in Action Outcome Measure
- ○ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	1	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- ☑ 213 - Weeds Affecting Plants
- ☑ 215 - Biological Control of Pests Affecting Plants
- ☑ 216 - Integrated Pest Management Systems

Outcome #6

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Delayed evolution of herbicide-resistant weeds

2. Associated Institution Types

☐ 1862 Extension
☑ 1862 Research

3a. Outcome Type:

◯ Change in Knowledge Outcome Measure
◉ Change in Action Outcome Measure
◯ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	1	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

☑ 213 - Weeds Affecting Plants
☑ 215 - Biological Control of Pests Affecting Plants
☑ 216 - Integrated Pest Management Systems

Outcome #7

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Estimated dollar value weed-control brings to North Dakota

2. Associated Institution Types

- ☐ 1862 Extension
- ☑ 1862 Research

3a. Outcome Type:

- ○ Change in Knowledge Outcome Measure
- ○ Change in Action Outcome Measure
- ◉ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	1000000000	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- ☑ 213 - Weeds Affecting Plants
- ☑ 215 - Biological Control of Pests Affecting Plants
- ☑ 216 - Integrated Pest Management Systems

Outcome #8

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Percent of producers that utilize our recommendations

2. Associated Institution Types

- ☐ 1862 Extension
- ☑ 1862 Research

3a. Outcome Type:

- ○ Change in Knowledge Outcome Measure
- ○ Change in Action Outcome Measure
- ◉ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	90	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- ☑ 213 - Weeds Affecting Plants
- ☑ 215 - Biological Control of Pests Affecting Plants
- ☑ 216 - Integrated Pest Management Systems

Outcome #9

1. Outcome Measures

☐ Not Reporting on this Outcome Measure

Number of field operations that growers eliminated by using integrated weed management practices in glyphosate-resistant sugarbeets.

2. Associated Institution Types

- ☐ 1862 Extension
- ☑ 1862 Research

3a. Outcome Type:

- ○ Change in Knowledge Outcome Measure
- ◉ Change in Action Outcome Measure
- ○ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	2

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Sugarbeet are highly susceptible to weed competition. As a consequence, sugarbeet growers had used a combination of multiple herbicide applications plus row cultivation to control weeds, which was expensive, time consuming, and could damage the sugarbeet seedlings. With the introduction of glyphosate-resistant varieties, growers needed education on how to use this technology to manage weeds in an effective and efficient manner. By 2010, nearly 95% of the

211,000 acres of sugarbeet in North Dakota was planted to glyphosate-resistant varieties. Integrated weed management is practiced to maximize weed control and yield while minimizing the number of weed control passes across a field.

What has been done
Applied research was conducted to develop recommendations for the most effective use of the glyphosate-resistant sugarbeet technology. This information on integrated weed management in glyphosate-resistant sugarbeet was disseminated at field days and grower and allied agricultural industry in the Red River Valley of North Dakota and Minnesota and in southern Minnesota. In addition, newsletter articles and extension publications have been developed to disseminate information about integrated weed management.

Results
The 2010 Sugarbeet Grower Survey reported that growers planting glyphosate-resistant sugarbeet reduced the number of weed control operations across a field by two (reduced herbicide applications by 1.3 and row-crop cultivations by 0.6) compared to growers planting conventional sugarbeet. According to the 2010 North Dakota custom rate chart, the combined average savings by reducing the number of weed control passes in glyphosate-resistant sugarbeet is $11.24/acre. The total savings for North Dakota sugarbeet growers by reducing the number of weed control passes in glyphosate-resistant sugarbeet was $2.4 million in 2010. In addition to these savings, growers should have reduced soil erosion by reducing the frequency of row-crop cultivation.

4. Associated Knowledge Areas

- ☑ 213 - Weeds Affecting Plants
- ☑ 215 - Biological Control of Pests Affecting Plants
- ☑ 216 - Integrated Pest Management Systems

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
- ☐ Competing Programmatic Challenges
- ☐ Populations changes (immigration, new cultural groupings, etc.)
- ☐ Other

Brief Explanation

The increasing cost of inputs (i.e. herbicides, fuel, labor, land rent) provides an incentive for sugarbeet growers to be interested in practices that reduce costs and increase profits.

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

(OPTIONAL SECTION)

1. Evaluation Studies Planned

- ☐ After Only (post program)
- ☐ Retrospective (post program)
- ☐ Before-After (before and after program)
- ☐ During (during program)
- ☐ Time series (multiple points before and after program)
- ☐ Case Study
- ☐ Comparisons between program participants (individuals, group, organizations) and non-participants
- ☐ Comparisons between different groups of individuals or program participants experiencing different levels of program intensity.
- ☐ Comparison between locales where the program operates and sites without program intervention
- ☑ Other (grower survey)

Evaluation Results

The number of sugarbeet growers responding to the 2010 survey was 268. These growers represented 21% of the total sugarbeet acreage in Minnesota and North Dakota. The results are reported above.

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 5

1. Name of the Planned Program

Climate Change - Soil Science

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
102	Soil, Plant, Water, Nutrient Relationships	60%		60%	
205	Plant Management Systems	40%		40%	
	Total	100%		100%	

Add knowledge area

V(C). Planned Program (Inputs)

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

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Plan	1.0	0.0	3.0	0.0
Actual	1.0	0.0	3.0	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**
32000	0	113100	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
48000	0	169500	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

- N rate calibration research projects

- Update producer-oriented resource materials to reflect research results of N rate studies
- Present research results at workshops, field days and conferences
- Evaluate nitrate levels in waterways

2. Brief description of the target audience

- Growers
- Soil testing laboratories
- Government agencies
- Federal land managers
- Consultants, agricultural industry staff, and the public

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	3000	100000	100	5
Actual	4000	150000	150	200

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

Patent Applications Submitted

Year: 2010
Plan: 0
Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Plan	2	3	
Actual	2	4	6

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- {No Data Entered}

Not reporting on this Output for this Annual Report

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of individuals receiving individual assistance
2	Number of individuals decreasing excessive N use
3	Number of individuals using alternative N sources
4	Number of individuals implementing recommended action or practice
5	Continued decline of N in ground and surface water (%)
6	Estimated dollar value of adopted best management practices ($)
7	Less commercial N is used (%)
8	Percent of spring wheat and durum wheat growers who adopted the use of the new NDSU nitrogen recommendations.

Add Cross-cutting Outcome/Impact Statement or Unintended or Previously Unknown Outcome Measure

Outcome #1

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Number of individuals receiving individual assistance

2. Associated Institution Types

☑ 1862 Extension
☑ 1862 Research

3a. Outcome Type:

◉ Change in Knowledge Outcome Measure
◯ Change in Action Outcome Measure
◯ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	4000	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

☑ 102 - Soil, Plant, Water, Nutrient Relationships
☑ 205 - Plant Management Systems

Outcome #2

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Number of individuals decreasing excessive N use

2. Associated Institution Types

- ☑ 1862 Extension
- ☑ 1862 Research

3a. Outcome Type:

- ◉ Change in Knowledge Outcome Measure
- ◯ Change in Action Outcome Measure
- ◯ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	2000	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- ☑ 102 - Soil, Plant, Water, Nutrient Relationships
- ☑ 205 - Plant Management Systems

Outcome #3

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Number of individuals using alternative N sources

2. Associated Institution Types

- ☑ 1862 Extension
- ☑ 1862 Research

3a. Outcome Type:

- ◉ Change in Knowledge Outcome Measure
- ◯ Change in Action Outcome Measure
- ◯ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual

2010	1000	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- ☑ 102 - Soil, Plant, Water, Nutrient Relationships
- ☑ 205 - Plant Management Systems

Outcome #4

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Number of individuals implementing recommended action or practice

2. Associated Institution Types

- ☑ 1862 Extension
- ☑ 1862 Research

3a. Outcome Type:

- ○ Change in Knowledge Outcome Measure
- ◉ Change in Action Outcome Measure
- ○ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	1000	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- ☑ 102 - Soil, Plant, Water, Nutrient Relationships
- ☑ 205 - Plant Management Systems

Outcome #5

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Continued decline of N in ground and surface water (%)

2. Associated Institution Types

- ☑ 1862 Extension
- ☑ 1862 Research

3a. Outcome Type:

- ○ Change in Knowledge Outcome Measure
- ◉ Change in Action Outcome Measure
- ○ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	2	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- ☑ 102 - Soil, Plant, Water, Nutrient Relationships
- ☑ 205 - Plant Management Systems

Outcome #6

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Estimated dollar value of adopted best management practices ($)

2. Associated Institution Types

- ☑ 1862 Extension
- ☑ 1862 Research

3a. Outcome Type:

- ○ Change in Knowledge Outcome Measure
- ○ Change in Action Outcome Measure
- ◉ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	20000000	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- ☑ 102 - Soil, Plant, Water, Nutrient Relationships
- ☑ 205 - Plant Management Systems

Outcome #7

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Less commercial N is used (%)

2. Associated Institution Types

- ☑ 1862 Extension
- ☑ 1862 Research

3a. Outcome Type:

- ○ Change in Knowledge Outcome Measure
- ○ Change in Action Outcome Measure
- ◉ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual

2010	5	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- ☑ 102 - Soil, Plant, Water, Nutrient Relationships
- ☑ 205 - Plant Management Systems

Outcome #8

1. Outcome Measures

☐ Not Reporting on this Outcome Measure

Percent of spring wheat and durum wheat growers who adopted the use of the new NDSU nitrogen recommendations.

2. Associated Institution Types

- ☑ 1862 Extension
- ☑ 1862 Research

3a. Outcome Type:

- ○ Change in Knowledge Outcome Measure
- ◉ Change in Action Outcome Measure
- ○ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	50

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Previous spring wheat and durum wheat recommendations were 30 years old, state-wide in scope, and relied on a grower prediction of yield in each year. This led to under fertilization in many years with dire economic consequences. The NDSU Extension service released new recommendations for 2010. These recommendations are based on the "return to nitrogen" concept that considers the relationship of wheat yield to nitrogen rate, soil test nitrogen, credits from previous crops, the relationships of wheat grain protein to nitrogen rate, and the cost of nitrogen. These recommendations will provide an economic optimum nitrogen rate recommendation to growers.

What has been done
The new recommendations recognize differences in nitrogen availability and historic yield in three unique areas of the state. The new recommendations provide a nitrogen credit for long-term (more than 6 years) continuous no-till crop production supported by the research data from over 100 site-years of experiments. The recommendations strongly support the continued use of soil testing for nitrate to a depth of 2-feet. The recommendations support an organic matter nitrogen credit if the soil levels are above 5.9%, but not below. The recommendations are available in paper copy, but also as an interactive web-based worksheet, which is available as the North Dakota Spring Wheat and Durum Nitrogen Calculator.

Results
Consultants and growers responding to a presentation of the new recommendations expressed their understanding of the principles and data behind the new recommendations and their willingness to adopt the new method. The interactive calculator has been a huge success. Consultant and grower feedback has been universally positive. Growers continue to express willingness to adopt the new recommendations. Although a definitive percentage of growers who adopted the practice is not available, feedback from numerous consultants and growers indicate that the number is substantial and likely exceeds 50%. Acres soil tested due to the computer-based recommendation worksheet has increased. As a metric, North Dakota is the only state out of Montana and Minnesota that saw an increase in spring wheat and durum protein in 2010, which is most likely due to grower adoption of the new recommendations. Consultants with a suite of growers have related that their clients who used the new recommendations experienced high yields and protein, while growers that fertilized as they had in the past did not achieve both goals. Projections estimate that if half of North Dakota's wheat growers use the new recommendations, the result should be about 10% greater yield and 1% more protein than otherwise. This would equate to a net benefit of about $148 million per year.

4. Associated Knowledge Areas

- ☑ 102 - Soil, Plant, Water, Nutrient Relationships
- ☑ 205 - Plant Management Systems

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
- ☐ Competing Programmatic Challenges
- ☐ Populations changes (immigration, new cultural groupings, etc.)
- ☐ Other

Brief Explanation

Growers continue to see the need for high yields and protein, and most realize that the previous nitrogen recommendations were not helpful to consistently achieve these goals. Hard red spring wheat price is docked at lower protein levels, which is a result of low nitrogen fertility.

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

(OPTIONAL SECTION)

1. Evaluation Studies Planned

- ☑ After Only (post program)
- ☐ Retrospective (post program)
- ☐ Before-After (before and after program)
- ☐ During (during program)
- ☐ Time series (multiple points before and after program)
- ☐ Case Study
- ☐ Comparisons between program participants (individuals, group, organizations) and non-participants
- ☐ Comparisons between different groups of individuals or program participants experiencing different levels of program intensity.
- ☐ Comparison between locales where the program operates and sites without program intervention
- ☐ Other

Evaluation Results

Evaluations were completed in January 2010 at the Soil and Soil Water Workshop, the Extension Crop Production workshops in NW North Dakota in Dec/Jan 2009, the Devils Lake Roundup in 2011, the Best of the Best wheat programs in 2010 and the Minnesota Wheat Growers meeting in Grand Forks, 2011. The results express grower and consultant understanding of the new recommendations and the process used to formulate the recommendations. They also indicate a strong willingness by growers and their consultants to adopt the new recommendations.

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 6

1. Name of the Planned Program

Sustainable Energy

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
403	Waste Disposal, Recycling, and Reuse	10%		10%	
511	New and Improved Non-Food Products and Processes	80%		80%	
512	Quality Maintenance in Storing and Marketing Non-Food Products	10%		10%	
	Total	100%		100%	

Add knowledge area

V(C). Planned Program (Inputs)

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

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Plan	0.5	0.0	2.0	0.0
Actual	1.5	0.0	2.0	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
48000	0	75400	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
72000	0	113000	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

- Identify bioenergy and sustainable energy research needs critical to North Dakota.
- Identify NDSU faculty, industries and other universities for collaboration.
- Expand bioenergy and sustainable energy research infrastructure and faculty expertise.
- Present results through publications and conference presentations.
- Educate through teaching and extension programming.

2. Brief description of the target audience

- Farmers
- Policymakers
- Biomass processors
- Equipment manufacturers
- Peer researchers
- Students
- Public

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	150	500	40	200
Actual	400	5000	25	500

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

Patent Applications Submitted

Year: 2010
Plan: 0
Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Plan	2	4	
Actual	1	1	2

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- {No Data Entered}

Not reporting on this Output for this Annual Report

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of faculty collaborations working on biofuels projects.
2	Number of proposals submitted for biofuels projects.
3	Number of graduate students working on biofuels projects.
4	Number of biofuels-related papers published by NDSU faculty.
5	Grant money received for biofuels research.
6	Increased demand for NDSU graduate students in academia/industry.
7	Increase in quality/quantity of student applicants in biofuels-related fields.
8	Biobased industries seek out NDSU faculty for collaborations on biofuels projects.
9	State and federal policymakers seek out NDSU faculty input.
10	Number of farmers in each of five non-traditional growing sugarbeet areas educated about the opportunity to raise sugarbeets for biofuel production.

Add Cross-cutting Outcome/Impact Statement or Unintended or Previously Unknown Outcome Measure

Outcome #1

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Number of faculty collaborations working on biofuels projects.

2. Associated Institution Types

☑ 1862 Extension
☑ 1862 Research

3a. Outcome Type:

◉ Change in Knowledge Outcome Measure
◯ Change in Action Outcome Measure
◯ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	5	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

☑ 403 - Waste Disposal, Recycling, and Reuse
☑ 511 - New and Improved Non-Food Products and Processes
☑ 512 - Quality Maintenance in Storing and Marketing Non-Food Products

Outcome #2

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Number of proposals submitted for biofuels projects.

2. Associated Institution Types

- ☐ 1862 Extension
- ☑ 1862 Research

3a. Outcome Type:

- ○ Change in Knowledge Outcome Measure
- ◉ Change in Action Outcome Measure
- ○ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	5	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- ☑ 403 - Waste Disposal, Recycling, and Reuse
- ☑ 511 - New and Improved Non-Food Products and Processes
- ☑ 512 - Quality Maintenance in Storing and Marketing Non-Food Products

Outcome #3

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Number of graduate students working on biofuels projects.

2. Associated Institution Types

- ☐ 1862 Extension
- ☑ 1862 Research

3a. Outcome Type:

- ○ Change in Knowledge Outcome Measure
- ◉ Change in Action Outcome Measure
- ○ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	3	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- ☑ 403 - Waste Disposal, Recycling, and Reuse
- ☑ 511 - New and Improved Non-Food Products and Processes
- ☑ 512 - Quality Maintenance in Storing and Marketing Non-Food Products

Outcome #4

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Number of biofuels-related papers published by NDSU faculty.

2. Associated Institution Types

- ☐ 1862 Extension
- ☑ 1862 Research

3a. Outcome Type:

- ○ Change in Knowledge Outcome Measure
- ◉ Change in Action Outcome Measure
- ○ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	4	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- ☑ 403 - Waste Disposal, Recycling, and Reuse
- ☑ 511 - New and Improved Non-Food Products and Processes
- ☑ 512 - Quality Maintenance in Storing and Marketing Non-Food Products

Outcome #5

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Grant money received for biofuels research.

2. Associated Institution Types

- ☐ 1862 Extension
- ☑ 1862 Research

3a. Outcome Type:

- ○ Change in Knowledge Outcome Measure
- ◉ Change in Action Outcome Measure
- ○ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	1250000	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- ☑ 403 - Waste Disposal, Recycling, and Reuse
- ☑ 511 - New and Improved Non-Food Products and Processes
- ☑ 512 - Quality Maintenance in Storing and Marketing Non-Food Products

Outcome #6

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Increased demand for NDSU graduate students in academia/industry.

2. Associated Institution Types

☐ 1862 Extension
☑ 1862 Research

3a. Outcome Type:

◯ Change in Knowledge Outcome Measure
◯ Change in Action Outcome Measure
◉ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	2	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

☑ 403 - Waste Disposal, Recycling, and Reuse
☑ 511 - New and Improved Non-Food Products and Processes
☑ 512 - Quality Maintenance in Storing and Marketing Non-Food Products

Outcome #7

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Increase in quality/quantity of student applicants in biofuels-related fields.

2. Associated Institution Types

- ☐ 1862 Extension
- ☑ 1862 Research

3a. Outcome Type:

- ○ Change in Knowledge Outcome Measure
- ○ Change in Action Outcome Measure
- ◉ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	6	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- ☑ 403 - Waste Disposal, Recycling, and Reuse
- ☑ 511 - New and Improved Non-Food Products and Processes
- ☑ 512 - Quality Maintenance in Storing and Marketing Non-Food Products

Outcome #8

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Biobased industries seek out NDSU faculty for collaborations on biofuels projects.

2. Associated Institution Types

- ☐ 1862 Extension
- ☑ 1862 Research

3a. Outcome Type:

- ○ Change in Knowledge Outcome Measure
- ○ Change in Action Outcome Measure
- ◉ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	4	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- ☑ 403 - Waste Disposal, Recycling, and Reuse
- ☑ 511 - New and Improved Non-Food Products and Processes
- ☑ 512 - Quality Maintenance in Storing and Marketing Non-Food Products

Outcome #9

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

State and federal policymakers seek out NDSU faculty input.

2. Associated Institution Types

- ☑ 1862 Extension
- ☑ 1862 Research

3a. Outcome Type:

- ○ Change in Knowledge Outcome Measure
- ○ Change in Action Outcome Measure
- ◉ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	6	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- ☑ 403 - Waste Disposal, Recycling, and Reuse
- ☑ 511 - New and Improved Non-Food Products and Processes
- ☑ 512 - Quality Maintenance in Storing and Marketing Non-Food Products

Outcome #10

1. Outcome Measures

☐ Not Reporting on this Outcome Measure

Number of farmers in each of five non-traditional growing sugarbeet areas educated about the opportunity to raise sugarbeets for biofuel production.

2. Associated Institution Types

- ☑ 1862 Extension
- ☑ 1862 Research

3a. Outcome Type:

- ◉ Change in Knowledge Outcome Measure
- ◯ Change in Action Outcome Measure
- ◯ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	50

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
North Dakota farmers seek to develop new biofuel industries in the state and diversity their cropping operations. Additional corn production for traditional ethanol production is limited by the state's arid climate and adverse weather conditions in the past several years. Visionary farmers seek to develop a biofuel industry that aligns with national biofuel goals of producing fuel with lower carbon footprint. This will contribute to national renewable energy production goals while enhancing the local economic vitality of rural communities and sustaining farm profitability.

What has been done
Dr. Cole Gustafson initiated an energy beet development program in 2009. Grant funding was obtained in 2009 for an economic feasibility study. In 2010, a second grant was obtained to establish regional energy beet yield trials, initiate a juice storage study, test the conversion technology commercially, and conduct grower education meetings. To date, more than 20 presentations and workshops have been delivered across the state in cooperation with local Extension agents to inform producers, rural communicates and industry of the opportunity. Materials have also been drafted for national distribution on www.eXtension.org.

Results

Green Vision Group is now evaluating two sites for construction of demonstration plant. In 2011, NDSU will assist the project with expanded yield trials. Data from these trials will be provided to USDA/RMA for purposes of developing a new energy beet crop insurance product to mitigate farm production risk. NDSU will also conduct a lifecycle analysis to obtain U.S. EPA approval of energy beet biofuel. Construction of a commercial plant is expected in 2012. This plant will require 30,000 acres of energy beets providing growers with a $200 net income premium over competing crops. Each plant is expected to create 25 new jobs in rural communities. Positive encouragement and private funding support for the project has been received from MonDak sugarbeet growers, Syngenta, Beta Seed, Garrison Diversion, ND Irrigation Association, Green Vision, Great River Energy, Amity, and AgCountry Farm Credit Services.

4. Associated Knowledge Areas

- ☑ 403 - Waste Disposal, Recycling, and Reuse
- ☑ 511 - New and Improved Non-Food Products and Processes
- ☑ 512 - Quality Maintenance in Storing and Marketing Non-Food Products

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
- ☐ Competing Programmatic Challenges
- ☐ Populations changes (immigration, new cultural groupings, etc.)
- ☐ Other

Brief Explanation

Climate change policy which is the basis for many biofuel policies was not approved by U.S. Congress in Fall 2010. Additionally tight credit markets tempered the interest of developers who have difficulty securing project financing.

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

(OPTIONAL SECTION)

1. Evaluation Studies Planned

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

- ☐ Time series (multiple points before and after program)
- ☐ Case Study
- ☑ Comparisons between program participants (individuals, group, organizations) and non-participants
- ☐ Comparisons between different groups of individuals or program participants experiencing different levels of program intensity.
- ☐ Comparison between locales where the program operates and sites without program intervention
- ☐ Other

Evaluation Results

Impact described above compares economic impact of participants who would grow sugarbeets with those who do not. This year, yield trials were conducted to determine yield potential in new growing areas. Future studies will evaluate grower profitability from both production and investment in processing plant.

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 7

1. Name of the Planned Program

Climate Change - Insect 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
211	Insects, Mites, and Other Arthropods Affecting Plants	55%		55%	
216	Integrated Pest Management Systems	40%		40%	
721	Insects and Other Pests Affecting Humans	5%		5%	
	Total	100%		100%	

Add knowledge area

V(C). Planned Program (Inputs)

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

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Plan	2.0	0.0	4.0	0.0
Actual	2.0	0.0	5.0	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
64000	0	188500	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
96000	0	282500	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

- Assess emerging pest issues
- Provide insect diagnostics
- Provide bio-based pest management systems
- Meet social and regulatory needs
- Evaluate activity effectiveness

2. Brief description of the target audience

- Crop and animal agricultural producers
- Home owners
- Agribusiness
- Government and NGO agency personnel
- Medical professionals
- Crop Consultants
- General public

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	5000	100000	8000	0
Actual	5000	100000	8000	0

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

Patent Applications Submitted

Year: 2010
Plan: 0
Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Plan	75	12	
Actual	75	12	87

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- {No Data Entered}

Not reporting on this Output for this Annual Report

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Pest alerts disseminated through various channels
2	Improved pest management practices based on currently available research knowledge
3	Relevant research and extension programs in entomology initiated
4	Conduct diagnostic insect identification review session with Plant Diagnostics Lab
5	Output materials made available to users
6	Accurate insect diagnostics and reporting integrated with Plant Diagnostics Lab, National Plant Diagnostic Network and others
7	Pest management technologies that meet social and regulatory constraints
8	Estimation of adoption rate of best pest management practices
9	Insect diagnostic capacity meeting national needs
10	Number of extension professionals, producers, agribusiness professionals, crop consultants, researchers, state or federal agency workers, etc. receiving education on improved pest management practices for wheat stem sawfly.

Add Cross-cutting Outcome/Impact Statement or Unintended or Previously Unknown Outcome Measure

Outcome #1

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Pest alerts disseminated through various channels

2. Associated Institution Types

☑ 1862 Extension
☑ 1862 Research

3a. Outcome Type:

◉ Change in Knowledge Outcome Measure
◯ Change in Action Outcome Measure
◯ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	9000	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

☑ 211 - Insects, Mites, and Other Arthropods Affecting Plants
☑ 216 - Integrated Pest Management Systems
☑ 721 - Insects and Other Pests Affecting Humans

Outcome #2

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Improved pest management practices based on currently available research knowledge

2. Associated Institution Types

- ☑ 1862 Extension
- ☑ 1862 Research

3a. Outcome Type:

- ◉ Change in Knowledge Outcome Measure
- ◯ Change in Action Outcome Measure
- ◯ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	550	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- ☑ 211 - Insects, Mites, and Other Arthropods Affecting Plants
- ☑ 216 - Integrated Pest Management Systems
- ☐ 721 - Insects and Other Pests Affecting Humans

Outcome #3

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Relevant research and extension programs in entomology initiated

2. Associated Institution Types

- ☑ 1862 Extension
- ☑ 1862 Research

3a. Outcome Type:

- ◉ Change in Knowledge Outcome Measure
- ◯ Change in Action Outcome Measure
- ◯ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	1	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- ☑ 211 - Insects, Mites, and Other Arthropods Affecting Plants
- ☑ 216 - Integrated Pest Management Systems
- ☑ 721 - Insects and Other Pests Affecting Humans

Outcome #4

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Conduct diagnostic insect identification review session with Plant Diagnostics Lab

2. Associated Institution Types

- ☑ 1862 Extension
- ☑ 1862 Research

3a. Outcome Type:

- ◉ Change in Knowledge Outcome Measure
- ◯ Change in Action Outcome Measure
- ◯ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	3	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- ☑ 211 - Insects, Mites, and Other Arthropods Affecting Plants
- ☑ 216 - Integrated Pest Management Systems
- ☑ 721 - Insects and Other Pests Affecting Humans

Outcome #5

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Output materials made available to users

2. Associated Institution Types

- ☑ 1862 Extension
- ☑ 1862 Research

3a. Outcome Type:

- ◯ Change in Knowledge Outcome Measure
- ◉ Change in Action Outcome Measure
- ◯ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	100	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- ☑ 211 - Insects, Mites, and Other Arthropods Affecting Plants
- ☑ 216 - Integrated Pest Management Systems
- ☑ 721 - Insects and Other Pests Affecting Humans

Outcome #6

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Accurate insect diagnostics and reporting integrated with Plant Diagnostics Lab, National Plant Diagnostic Network and others

2. Associated Institution Types

☑ 1862 Extension
☑ 1862 Research

3a. Outcome Type:

○ Change in Knowledge Outcome Measure
◉ Change in Action Outcome Measure
○ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	14000	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

☑ 211 - Insects, Mites, and Other Arthropods Affecting Plants
☑ 216 - Integrated Pest Management Systems
☑ 721 - Insects and Other Pests Affecting Humans

Outcome #7

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Pest management technologies that meet social and regulatory constraints

2. Associated Institution Types

- ☑ 1862 Extension
- ☑ 1862 Research

3a. Outcome Type:

- ○ Change in Knowledge Outcome Measure
- ○ Change in Action Outcome Measure
- ◉ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	1	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- ☑ 211 - Insects, Mites, and Other Arthropods Affecting Plants
- ☑ 216 - Integrated Pest Management Systems
- ☑ 721 - Insects and Other Pests Affecting Humans

Outcome #8

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Estimation of adoption rate of best pest management practices

2. Associated Institution Types

- ☑ 1862 Extension
- ☑ 1862 Research

3a. Outcome Type:

- ○ Change in Knowledge Outcome Measure
- ○ Change in Action Outcome Measure
- ◉ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	1	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- ☑ 211 - Insects, Mites, and Other Arthropods Affecting Plants
- ☑ 216 - Integrated Pest Management Systems
- ☐ 721 - Insects and Other Pests Affecting Humans

Outcome #9

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Insect diagnostic capacity meeting national needs

2. Associated Institution Types

- ☑ 1862 Extension
- ☑ 1862 Research

3a. Outcome Type:

- ○ Change in Knowledge Outcome Measure
- ○ Change in Action Outcome Measure
- ◉ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	1	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- ☑ 211 - Insects, Mites, and Other Arthropods Affecting Plants
- ☑ 216 - Integrated Pest Management Systems
- ☑ 721 - Insects and Other Pests Affecting Humans

Outcome #10

1. Outcome Measures

☐ Not Reporting on this Outcome Measure

Number of extension professionals, producers, agribusiness professionals, crop consultants, researchers, state or federal agency workers, etc. receiving education on improved pest management practices for wheat stem sawfly.

2. Associated Institution Types

- ☑ 1862 Extension
- ☑ 1862 Research

3a. Outcome Type:

- ◉ Change in Knowledge Outcome Measure
- ◯ Change in Action Outcome Measure
- ◯ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	10000

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Wheat stem sawfly is a major insect pest of spring wheat, winter wheat and durum in North Dakota. Sawfly larvae feed inside the stem, which impairs grain development and may reduce grain protein. Mature larvae girdle the bases of plants, which results in lodging and further yield loss because it is difficult or impossible to harvest sawfly-lodged plants. North Dakota wheat growers lose an estimated $28-$70 million annually to wheat stem sawfly. Because of its long flight period, insecticides are ineffective at controlling wheat stem sawfly. Other effective Integrated Pest Management (IPM) strategies are needed.

What has been done
NDSU Extension Entomology, in collaboration with NDSU Research Extension Center extension personnel, Montana State University researchers, USDA-ARS researchers, North Dakota and Montana wheat commodity groups and wheat growers organized and held a Focus Group meeting in January 2010 to address current problems and summarize current research on wheat stem sawfly. We used this information to identify extension and research priorities and needs. Research and Extension presentations addressed IPM strategies for management of wheat stem

sawfly, including use of solid-stemmed cultivars, insecticide efficacy, crop rotation, trap crops, cultivation, and conservation of native biological control agents. These recommendations were communicated through a new extension bulletin and video.

Results
The focus group was effective in identifying priorities and communicating the current knowledge about sawfly management. The presentations were effective in increasing wheat producer knowledge and changes in sawfly management practices are anticipated. Based on a pre-post survey, 95% of growers are more likely to manage for sawfly; 0% of growers will use insecticides for sawfly compared with 8% before the meeting; 55% of growers will use solid-stemmed varieties compared with 12% before the meeting; growers will continue to use crop rotation as a management strategy; and 100% of growers will scout for sawfly compared with 56% before the meeting. NDSU research and extension efforts will result in: better prediction and identification of sawfly problem areas; less economic loss due to wheat stem sawfly; improved wheat cultivars with sawfly resistance; increased wheat yields; savings in pesticide applications that are not effective; and implementation of the best sawfly management strategies.

4. Associated Knowledge Areas

- ☑ 211 - Insects, Mites, and Other Arthropods Affecting Plants
- ☑ 216 - Integrated Pest Management Systems
- ☑ 721 - Insects and Other Pests Affecting Humans

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
- ☐ Competing Programmatic Challenges
- ☐ Populations changes (immigration, new cultural groupings, etc.)
- ☐ Other

Brief Explanation

The wheat region affected by sawfly is lower yielding because of lower annual precipitation. Consequently, economic losses caused by this insect are more important to producer profitability.

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

(OPTIONAL SECTION)

1. Evaluation Studies Planned

- ☐ After Only (post program)
- ☐ Retrospective (post program)
- ☑ Before-After (before and after program)
- ☐ During (during program)
- ☐ Time series (multiple points before and after program)
- ☐ Case Study
- ☐ Comparisons between program participants (individuals, group, organizations) and non-participants
- ☐ Comparisons between different groups of individuals or program participants experiencing different levels of program intensity.
- ☐ Comparison between locales where the program operates and sites without program intervention
- ☐ Other

Evaluation Results

See specific outcomes (above).

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 8

1. Name of the Planned Program

Center for Nutrition and Pregnancy

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
301	Reproductive Performance of Animals	0%		40%	
302	Nutrient Utilization in Animals	0%		40%	
305	Animal Physiological Processes	0%		10%	
702	Requirements and Function of Nutrients and Other Food Components	0%		10%	
	Total	0%		100%	

Add knowledge area

V(C). Planned Program (Inputs)

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

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	4.0	0.0
Actual	0.0	0.0	4.0	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**
0	0	150000	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
0	0	226000	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

•Research projects
•Train students
•Publish research
•Secure funding
•Develop recommendations
•Identify emerging trends and issues
•Improve methodology
•Collaborate

2. Brief description of the target audience

•Students: graduate and under-graduate
•Livestock producers
•Human health professionals
•Scientific peer groups
•Policy and agency influences
•Media professionals

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	0	0	0	0
Actual	250	1000	0	0

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

Year: 2010
Plan: 0
Actual: 1

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Plan	0	14	
Actual	0	20	20

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- {No Data Entered}

Not reporting on this Output for this Annual Report

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Numbers of producers with enhanced knowledge from livestock programming events
2	Number of grant requests for multidisciplinary educational, extension and research collaborative activities
3	Number of visiting scientists to the NDSU Department of Animal Sciences
4	Monitor cases of pregnancy-based metabolic diseases
5	Monitor North Dakota agricultural statistics to measure pregnancy rates of North Dakota livestock operations
6	Number of scientists in the beef and sheep industry that received research findings on the long-term effects of nutrition during gestation.

Add Cross-cutting Outcome/Impact Statement or Unintended or Previously Unknown Outcome Measure

Outcome #1

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Numbers of producers with enhanced knowledge from livestock programming events

2. Associated Institution Types

☐ 1862 Extension
☑ 1862 Research

3a. Outcome Type:

◉ Change in Knowledge Outcome Measure
◯ Change in Action Outcome Measure
◯ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	40	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

☑ 301 - Reproductive Performance of Animals
☑ 302 - Nutrient Utilization in Animals
☑ 305 - Animal Physiological Processes
☑ 702 - Requirements and Function of Nutrients and Other Food Components

Outcome #2

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Number of grant requests for multidisciplinary educational, extension and research collaborative activities

2. Associated Institution Types

- ☐ 1862 Extension
- ☑ 1862 Research

3a. Outcome Type:

- ◯ Change in Knowledge Outcome Measure
- ◉ Change in Action Outcome Measure
- ◯ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	5	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- ☑ 301 - Reproductive Performance of Animals
- ☑ 302 - Nutrient Utilization in Animals
- ☑ 305 - Animal Physiological Processes
- ☑ 702 - Requirements and Function of Nutrients and Other Food Components

Outcome #3

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Number of visiting scientists to the NDSU Department of Animal Sciences

2. Associated Institution Types

- ☐ 1862 Extension
- ☑ 1862 Research

3a. Outcome Type:

- ◯ Change in Knowledge Outcome Measure
- ◉ Change in Action Outcome Measure
- ◯ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	3	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- ☑ 301 - Reproductive Performance of Animals
- ☑ 302 - Nutrient Utilization in Animals
- ☑ 305 - Animal Physiological Processes
- ☑ 702 - Requirements and Function of Nutrients and Other Food Components

Outcome #4

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Monitor cases of pregnancy-based metabolic diseases

2. Associated Institution Types

- ☐ 1862 Extension
- ☑ 1862 Research

3a. Outcome Type:

- ○ Change in Knowledge Outcome Measure
- ○ Change in Action Outcome Measure
- ◉ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- ☑ 301 - Reproductive Performance of Animals
- ☑ 302 - Nutrient Utilization in Animals
- ☑ 305 - Animal Physiological Processes
- ☑ 702 - Requirements and Function of Nutrients and Other Food Components

Outcome #5

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Monitor North Dakota agricultural statistics to measure pregnancy rates of North Dakota livestock operations

2. Associated Institution Types

- ☐ 1862 Extension
- ☑ 1862 Research

3a. Outcome Type:

- ○ Change in Knowledge Outcome Measure
- ○ Change in Action Outcome Measure
- ◉ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- ☑ 301 - Reproductive Performance of Animals
- ☐ 302 - Nutrient Utilization in Animals
- ☐ 305 - Animal Physiological Processes
- ☐ 702 - Requirements and Function of Nutrients and Other Food Components

Outcome #6

1. Outcome Measures

☐ Not Reporting on this Outcome Measure

Number of scientists in the beef and sheep industry that received research findings on the long-term effects of nutrition during gestation.

2. Associated Institution Types

☐ 1862 Extension
☑ 1862 Research

3a. Outcome Type:

◉ Change in Knowledge Outcome Measure
◯ Change in Action Outcome Measure
◯ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	250

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Proper nutrition during gestation is not only important for maternal health and successful rebreeding, but also for fetal growth and development. It is well accepted that maternal nutrition can impact the long term health and productivity of her offspring. By proper nutrition during gestation, we have the potential to impact the efficiency of the offspring's growth performance and ultimate product quality. This could lead to reduced feed costs, less veterinary costs, and more productive animals. Moreover, during times when nutrition may not be adequate (i.e. drought), novel interventions may be used to assist nutrient delivery to the developing fetus.

What has been done
The Center for Nutrition and Pregnancy (CNP) continues to execute novel methods of therapeutics that could impact fetal development. Specifically, faculty associated with CNP have studied the impacts of selenium supplementation, differing levels of nutritional intake, protein supplementation, and maternal exercise on uterine and umbilical blood flows (i.e. nutrient delivery to the growing conceptus), placental development, gastrointestinal development of the dam and offspring, as well as maternal mammary gland development and milk production. Muscle growth and carcass quality has also been studied in our various models.

Results
Researchers associated with the CNP have shown that maternal supplementation of selenium from conception to birth can increase milk production of the dam, can impact the weight of various muscles in the offspring, and can also spare fetal growth retardation of the lamb. Moreover, nutritional intake can impact the hormone and metabolic profile within the maternal circulation which has the potential to alter milk production, as well as growth and performance of the

offspring. Maternal exercise increases umbilical blood flow in pigs. While there is no difference in piglet weight at birth, we did observe higher quality pork when those offspring reach market weight. Moreover, our dams appear to be more comfortable with decreased postural changes throughout the time period monitored. These research findings will contribute to the increased efficiency of the US livestock industry when the practices are adopted.

4. Associated Knowledge Areas

- ☑ 301 - Reproductive Performance of Animals
- ☑ 302 - Nutrient Utilization in Animals
- ☑ 305 - Animal Physiological Processes
- ☑ 702 - Requirements and Function of Nutrients and Other Food Components

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
- ☐ Competing Programmatic Challenges
- ☐ Populations changes (immigration, new cultural groupings, etc.)
- ☐ Other

Brief Explanation

High feed costs can limit the profitability of livestock producers, which increases the need for this research.

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

(OPTIONAL SECTION)

1. Evaluation Studies Planned

- ☑ After Only (post program)
- ☐ Retrospective (post program)
- ☐ Before-After (before and after program)
- ☐ During (during program)
- ☐ Time series (multiple points before and after program)
- ☐ Case Study
- ☐ Comparisons between program participants (individuals, group, organizations) and non-

participants

- ☐ Comparisons between different groups of individuals or program participants experiencing different levels of program intensity.
- ☐ Comparison between locales where the program operates and sites without program intervention
- ☐ Other

Evaluation Results

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 9

1. Name of the Planned Program

Nutrition of Grazing Livestock

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
121	Management of Range Resources	50%		50%	
302	Nutrient Utilization in Animals	50%		50%	
	Total	100%		100%	

Add knowledge area

V(C). Planned Program (Inputs)

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

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Plan	6.0	0.0	0.0	0.0
Actual	7.0	0.0	2.0	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**
224000	0	75400	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
336000	0	113000	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

•Develop presentation materials
•Develop resource material

•Provide presentations and workshops
•Translate scientific and technical materials into lay materials
•Identify emerging issues
•Evaluate effectiveness of activities

2. Brief description of the target audience

•Livestock producers

•4-H youth
•Feed and pharmaceutical industry personnel
•Government agency personnel
•Veterinarians

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	425	1600	0	0
Actual	611	25350	123	411

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

Patent Applications Submitted

Year: 2010
Plan: 0
Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Plan	1	0	
Actual	2	15	17

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- {No Data Entered}

Not reporting on this Output for this Annual Report

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of individuals receiving training and education
2	Number of individuals demonstrating increase in subject knowledge and skills
3	Number of producers implementing recommended actions or practices
4	Number of producers participating in government cost-share programs for range conservation
5	Estimated cost of production for North Dakota cattle ranches
6	Number of ranches implementing range management practices
7	Number of ranchers, land managers, and educators who were trained on effective grazing systems in 2010.

Add Cross-cutting Outcome/Impact Statement or Unintended or Previously Unknown Outcome Measure

Outcome #1

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Number of individuals receiving training and education

2. Associated Institution Types

☑ 1862 Extension
☐ 1862 Research

3a. Outcome Type:

◉ Change in Knowledge Outcome Measure
◯ Change in Action Outcome Measure
◯ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	425	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

☑ 121 - Management of Range Resources
☑ 302 - Nutrient Utilization in Animals

Outcome #2

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Number of individuals demonstrating increase in subject knowledge and skills

2. Associated Institution Types

- ☑ 1862 Extension
- ☐ 1862 Research

3a. Outcome Type:

- ◉ Change in Knowledge Outcome Measure
- ◯ Change in Action Outcome Measure
- ◯ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	125	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- ☑ 121 - Management of Range Resources
- ☑ 302 - Nutrient Utilization in Animals

Outcome #3

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Number of producers implementing recommended actions or practices

2. Associated Institution Types

- ☑ 1862 Extension
- ☐ 1862 Research

3a. Outcome Type:

- ◯ Change in Knowledge Outcome Measure
- ◉ Change in Action Outcome Measure
- ◯ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual

2010	30	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- ☑ 121 - Management of Range Resources
- ☑ 302 - Nutrient Utilization in Animals

Outcome #4

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Number of producers participating in government cost-share programs for range conservation

2. Associated Institution Types

- ☑ 1862 Extension
- ☐ 1862 Research

3a. Outcome Type:

- ○ Change in Knowledge Outcome Measure
- ◉ Change in Action Outcome Measure
- ○ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	60	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- ☑ 121 - Management of Range Resources
- ☐ 302 - Nutrient Utilization in Animals

Outcome #5

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Estimated cost of production for North Dakota cattle ranches

2. Associated Institution Types

- ☑ 1862 Extension
- ☐ 1862 Research

3a. Outcome Type:

- ○ Change in Knowledge Outcome Measure
- ○ Change in Action Outcome Measure
- ◉ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	525	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- ☑ 121 - Management of Range Resources
- ☑ 302 - Nutrient Utilization in Animals

Outcome #6

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Number of ranches implementing range management practices

2. Associated Institution Types

- ☑ 1862 Extension
- ☐ 1862 Research

3a. Outcome Type:

- ○ Change in Knowledge Outcome Measure
- ○ Change in Action Outcome Measure
- ◉ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	50	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- ☑ 121 - Management of Range Resources
- ☐ 302 - Nutrient Utilization in Animals

Outcome #7

1. Outcome Measures

☐ Not Reporting on this Outcome Measure

Number of ranchers, land managers, and educators who were trained on effective grazing systems in 2010.

2. Associated Institution Types

- ☑ 1862 Extension
- ☑ 1862 Research

3a. Outcome Type:

- ◉ Change in Knowledge Outcome Measure
- ○ Change in Action Outcome Measure
- ○ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual

2010	{No Data Entered}	215

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Private and public land managers and operators using grazing systems have the greatest potential to increase economic return from the same land base. Land costs have escalated to the point that young producers can no longer afford to buy new land and older generation producers are not willing to sell land. Thus, new money from an operation must come from within their current land holdings. By increasing the economic return from the same land, new money can be earned from the current land holdings, bring in new money to the local community. The potential impact in North Dakota alone is on 12 million acres of rangeland.

What has been done
One Extension Agent training session and three rancher workshops were conducted to create educational opportunities. These workshops led to the training of 34 livestock emphasis area county agents and 181 ranchers/land managers. On average, the ranchers/land managers operate 500 acres; creating an indirect impact on 90,500 acres. Two extension publications were developed, of which one was for youth and one peer-reviewed journal article published. Educational materials have been developed to educate on the land managers on grazing systems. Finally, the new Farm Bill should allow continuation of grazing systems to be funded within the EQIP program of the USDA NRCS.

Results
We published scientific paper on grazing efficiency of grazing systems in Range Ecology and Management to address a popular paper published in 2008 that stated grazing systems "don't work". Grazing systems are the number one tool used by USDA Natural Resource Conservation Service (NRCS) and the Extension Service for promoting improved range management to enhance the ecosystem, improve livestock production and enhance the economic return from the ranching operation. The US government has funded roughly $7 million through EQIP for grazing system development. By addressing the true application process of a grazing system, the NRCS can justify these dollars. The Extension Service can use the research data to help land managers better understand how and why grazing systems work. This paper can justify keeping grazing systems in the tool box for NRCS to use within the EQIP. A grazing system will enhance the carrying capacity by a minimum of 25% in North Dakota. Based on our latest surveys, 44% of ranchers use a grazing system for a potential impact on 5.1 million acres and direct economic impact by adding 159,000 cow/calf pairs to North Dakota. If the average return per acre rangeland is $18/acre (NASS) and income is increased by 25% through improved grazing efficiency, North Dakota ranchers can add $4.5/acre or $22.9 million per year.

4. Associated Knowledge Areas

- ☑ 121 - Management of Range Resources
- ☑ 302 - Nutrient Utilization in Animals

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
- ☐ Competing Programmatic Challenges
- ☐ Populations changes (immigration, new cultural groupings, etc.)
- ☐ Other

Brief Explanation

1) North Dakota has been in a wet cycle since 1993, creating conditions conducive to increased forage production in the state and region. This wet cycle creates complacency in the ranching industry and they are not as willing to improve rangeland management because the climate conditions creating a "false high return". As weather conditions return to normal (less precipitation), ranchers will be looking for techniques to enhance forage production to the wet cycle period. 2) Economic uncertainty has creating less money available for government funding of range improvement practices. Without the government support, ranchers are required to pay more for range improvements and less likely to improve their ranching strategies. 3) The US Government is going through an influx of change, creating questions in future direction of the Farm Bill and government programs.

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

(OPTIONAL SECTION)

1. Evaluation Studies Planned

- ☑ After Only (post program)
- ☐ Retrospective (post program)
- ☑ Before-After (before and after program)
- ☐ During (during program)
- ☐ Time series (multiple points before and after program)
- ☑ Case Study
- ☐ Comparisons between program participants (individuals, group, organizations) and non-participants
- ☐ Comparisons between different groups of individuals or program participants experiencing different levels of program intensity.
- ☐ Comparison between locales where the program operates and sites without program intervention
- ☐ Other

Evaluation Results

In a study comprised of seven research projects, grazing systems enhanced harvest efficiency by 16 to 42%. Changes to grazing management strategies enhanced the carrying capacity and nutrition quality of range and pastureland by 25-40%.

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 10

1. Name of the Planned Program

Food Safety

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
504	Home and Commercial Food Service	75%		0%	
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	25%		0%	
	Total	100%		0%	

Add knowledge area

V(C). Planned Program (Inputs)

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

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Plan	7.0	0.0	0.0	0.0
Actual	7.0	0.0	0.0	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**
224000	0	0	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
336000	0	0	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Implement programs for children and adults based on Fight BAC, Thermy, Produce Safety and BAC Down campaigns; USDA food preservation rules; and implement food safety programs for foodservice and processors (ServSafe, TAPS, HACCP).

2. Brief description of the target audience

Children in school and youth program settings
Teen food handlers in high school and community
Adults in home settings
Volunteer food handlers in community settings
Professionals in foodservice and food processing environments

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	5000	400000	2500	25000
Actual	5500	619000	52000	35000

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

Patent Applications Submitted

Year: 2010
Plan: 0
Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Plan	2	1	
Actual	20	2	22

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- {No Data Entered}

Not reporting on this Output for this Annual Report

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Based on post-surveys, 75 percent of children participating in handwashing classes will report intentions to wash hands properly
2	Based on post-surveys, 50 percent of teens will report changes in food handling practices to reduce risk of foodborne illness outbreaks
3	Seventy-five percent of foodservice and food industry participants in ServSafe, HACCP or other food sanitation courses will pass the examination.
4	Based on post-surveys, 50 percent of adult participants in consumer food safety classes will report intent to change one or more food handling behaviors.
5	Number of children instructed on how to properly wash their hands to reduce the risk of spreading disease.
6	Number of teens instructed on safe food handling practices to reduce the risk of foodborne illness outbreaks.
7	Number of adults trained on improved consumer food safety.

Add Cross-cutting Outcome/Impact Statement or Unintended or Previously Unknown Outcome Measure

Outcome #1

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Based on post-surveys, 75 percent of children participating in handwashing classes will report intentions to wash hands properly

2. Associated Institution Types

☑ 1862 Extension
☐ 1862 Research

3a. Outcome Type:

◉ Change in Knowledge Outcome Measure
◯ Change in Action Outcome Measure
◯ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	500	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

☑ 504 - Home and Commercial Food Service
☑ 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and

Outcome #2

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Based on post-surveys, 50 percent of teens will report changes in food handling practices to reduce risk of foodborne illness outbreaks

2. Associated Institution Types

- ☑ 1862 Extension
- ☐ 1862 Research

3a. Outcome Type:

- ◯ Change in Knowledge Outcome Measure
- ◉ Change in Action Outcome Measure
- ◯ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	1200	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- ☑ 504 - Home and Commercial Food Service
- ☑ 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and

Outcome #3

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Seventy-five percent of foodservice and food industry participants in ServSafe, HACCP or other food sanitation courses will pass the examination.

2. Associated Institution Types

- ☑ 1862 Extension
- ☐ 1862 Research

3a. Outcome Type:

- ◯ Change in Knowledge Outcome Measure
- ◉ Change in Action Outcome Measure
- ◯ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual

2010	60	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- ☑ 504 - Home and Commercial Food Service
- ☑ 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and

Outcome #4

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Based on post-surveys, 50 percent of adult participants in consumer food safety classes will report intent to change one or more food handling behaviors.

2. Associated Institution Types

- ☑ 1862 Extension
- ☐ 1862 Research

3a. Outcome Type:

- ○ Change in Knowledge Outcome Measure
- ○ Change in Action Outcome Measure
- ◉ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	3000	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- ☑ 504 - Home and Commercial Food Service
- ☑ 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and

Outcome #5

1. Outcome Measures

☐ Not Reporting on this Outcome Measure

Number of children instructed on how to properly wash their hands to reduce the risk of spreading disease.

2. Associated Institution Types

- ☑ 1862 Extension
- ☐ 1862 Research

3a. Outcome Type:

- ○ Change in Knowledge Outcome Measure
- ◉ Change in Action Outcome Measure
- ○ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	3948

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
According to the Centers for Disease Control and Prevention (CDC), hand washing is the single most important means of preventing the spread of disease. Studies in schools and childcare centers have shown links between improper or infrequent hand washing and colds, flu and foodborne illness outbreaks. The importance of handwashing has become more noteworthy with concerns about widespread flu outbreaks.

What has been done
Initiated in 2002, the "Wash Your Hands Project" instructors have used a fluorescing dye and ultraviolet light to show areas where students missed washing their hands. Students are provided instruction about proper handwashing. The students were provided a handout showing a hand and asked to mark the spots they missed washing (where the dye remained).

Results
Based on "seeing" where "germs" might hide on hands using a fluorescing dye and ultraviolet light, the "Wash Your Hands" project reached about 4,000 children in grades K-12 in schools throughout North Dakota. As evidence of an environmental change, many schools have purchased the equipment and integrated the teaching materials into their health educational curriculum. According to the results, fingertips, back of hand and wrists were commonly missed areas. About 87% of youth knew they should wash their hands for at least 20 seconds, about 92% said they would wash their hands more often, and 93% said they would wash their hands

more carefully. About 97% of teachers had reviewed the material, 86% of teachers reported talking about handwashing to students, and 81% reported that their students washed their hands more often.

4. Associated Knowledge Areas

- ☑ 504 - Home and Commercial Food Service
- ☐ 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and

Outcome #6

1. Outcome Measures

☐ Not Reporting on this Outcome Measure

Number of teens instructed on safe food handling practices to reduce the risk of foodborne illness outbreaks.

2. Associated Institution Types

- ☑ 1862 Extension
- ☐ 1862 Research

3a. Outcome Type:

- ○ Change in Knowledge Outcome Measure
- ◉ Change in Action Outcome Measure
- ○ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	1255

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
"Teens Serving Food Safely" is a statewide NDSU Extension Service food safety education effort designed to improve young food handlers' food safety knowledge and skills and decrease the risk of foodborne illness outbreaks associated with food service establishments. According to a 2002 U.S. Department of Labor report, 22% of employed 15- to 17-year olds work in eating and drinking establishments. According to the National Restaurant Association pocket fact book, 32% of adults got their first job experience in a restaurant.

What has been done
The "Teens" curriculum consists of five lessons based on the Fight BAC and Thermy national food safety campaign concepts, with pre/post and follow-up evaluation procedures. Youth benefit from the curriculum's experiential learning model, obtaining information and tools to share with their families.

Results

Since 2003, 6,294 North Dakota teens have been trained and received completion certificates based on the "Teens Serving Food Safely" curriculum. According to the past year's results, on average, knowledge scores increased from 53% on the pre-test to 84% on the post-test. About 57% of participants had been involved in the preparation of food for the public, and 90% prepare food for themselves or others every week. On the one-month follow up survey, 75% were more careful about cleaning and sanitizing, 43% had shared their knowledge about food safety with others, 85% reported washing their hands more often when preparing food and 35% have applied their knowledge when serving food for the public.

4. Associated Knowledge Areas

- ☑ 504 - Home and Commercial Food Service
- ☐ 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and

Outcome #7

1. Outcome Measures

☐ Not Reporting on this Outcome Measure

Number of adults trained on improved consumer food safety.

2. Associated Institution Types

- ☑ 1862 Extension
- ☐ 1862 Research

3a. Outcome Type:

- ○ Change in Knowledge Outcome Measure
- ◉ Change in Action Outcome Measure
- ○ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	3200

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Consumer food handling remains an issue of concern, and our main evaluation focused on outdoor grilling, a popular cooking method, and food preservation. Grilling is one of the healthier methods of preparing food; however, food safety issues, including quality issues and lack of thermometer use, have been cited as issues. Interest in food preservation has increased with rising food prices and renewed interests in local foods and gardening. Many younger adults lack experience with food preservation techniques and are seeking training so they preserve foods safely.

What has been done

A Barbeque Boot Camp program was initiated that brought together Extension, meat science, and food safety specialists and faculty from the Department of Animal Science, along with Extension agriculture and family and consumer science agents from across North Dakota. The boot camps were held in seven locations in North Dakota. The educational programs took place in classroom-type settings (educational booths) in public areas. Local Extension agents helped promote and, sometimes, teach the programs. Participants received a food thermometer and educational materials to use at home. Food preservation classes were held in nine counties.

Results
The BBQ Boot Camp reached 1,057 participants increased their knowledge and indicated they would change their behavior. Based on participant surveys, 15% "never" used a food thermometer when cooking before attending this session. According to the post-survey results, 96% planned to use a thermometer when grilling after attending BBQ Boot Camp. They indicated their knowledge of meat and livestock topics and barbecuing skills improved. According to a follow-up survey, participants have reported that that they use meat thermometers and know what temperatures are safe to cook different products to, such as ground beef and pork. According to follow-up survey results, 23% of the respondents use the thermometer every time they cook. According to evaluations of food preservation classes, 97% reported learning something new, 30% were new to food preservation, and 72% planned to make jams/jellies, 53% planned to freeze food, and 55% planned to can salsa.

4. Associated Knowledge Areas

- ☑ 504 - Home and Commercial Food Service
- ☑ 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and

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
- ☐ Competing Programmatic Challenges
- ☐ Populations changes (immigration, new cultural groupings, etc.)
- ☐ Other

Brief Explanation

External factors, including flooding and weather, did not affect the outcomes significantly.

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

(OPTIONAL SECTION)

1. Evaluation Studies Planned

- ☐ After Only (post program)
- ☑ Retrospective (post program)
- ☑ Before-After (before and after program)
- ☐ During (during program)
- ☐ Time series (multiple points before and after program)
- ☐ Case Study
- ☐ Comparisons between program participants (individuals, group, organizations) and non-participants
- ☐ Comparisons between different groups of individuals or program participants experiencing different levels of program intensity.
- ☑ Comparison between locales where the program operates and sites without program intervention
- ☐ Other

Evaluation Results

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 11

1. Name of the Planned Program

Childhood Obesity

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
703	Nutrition Education and Behavior	70%		0%	
724	Healthy Lifestyle	10%		0%	
806	Youth Development	20%		0%	
	Total	100%		0%	

Add knowledge area

V(C). Planned Program (Inputs)

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

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Plan	8.0	0.0	0.0	0.0
Actual	8.0	0.0	0.0	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**
256000	0	0	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
384000	0	0	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

- Identify emerging issues
- Translate scientific data
- Develop lessons and curricula
- Develop public campaigns
- Promote changes in public policy
- Train Extension Agents
- Develop evaluation methodology
- Analyze and report impacts

2. Brief description of the target audience

- Youth in schools, afterschool programs, and 4-H
- Adults in homes, worksites, and communities
- People with chronic disease

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	7000	400000	7000	25000
Actual	8100	570000	14000	35000

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

Patent Applications Submitted

Year: 2010
Plan: 0
Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Plan	3	1	
Actual	9	1	10

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- {No Data Entered}

Not reporting on this Output for this Annual Report

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Based on follow-up surveys of adult participants in walking programs, 50 percent will report increased number of steps or minutes of walking
2	Based on follow-up surveys of adult participants in nutrition education programs, 25 percent will report a change in behavior to be more consistent with current nutrition recommendations based on MyPyramid
3	Based on follow-up surveys of parents of children participating in nutrition education programs, 25 percent of parents will report a family behavior change to be consistent with current recommendations
4	Based on post-surveys of children involved in multi-session nutrition/fitness classes, 25 percent of participants will report a change in nutrition or fitness behavior to be consistent with current MyPyramid recommendations
5	Based on program evaluations, 25 percent of adult participants will demonstrate an increased knowledge and an intent to change nutrition behavior, which may help prevent diabetes or improve disease management.
6	Number of children in elementary classrooms and afterschool programs targeted with nutrition education programming, with multi-lesson curricula integrating MyPyramid-based nutrition and fitness concepts for grades 3-5, statewide.
7	Number of older adults (over 45) targeted with the "Eating for Your Eyes" project containing nutrition and health information about the role of nutrition and eye health.

Add Cross-cutting Outcome/Impact Statement or Unintended or Previously Unknown Outcome Measure

Outcome #1

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Based on follow-up surveys of adult participants in walking programs, 50 percent will report increased number of steps or minutes of walking

2. Associated Institution Types

☑ 1862 Extension
☐ 1862 Research

3a. Outcome Type:

○ Change in Knowledge Outcome Measure
◉ Change in Action Outcome Measure
○ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	500	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

☑ 703 - Nutrition Education and Behavior
☑ 724 - Healthy Lifestyle
☑ 806 - Youth Development

Outcome #2

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Based on follow-up surveys of adult participants in nutrition education programs, 25 percent will report a change in behavior to be more consistent with current nutrition recommendations based on MyPyramid

2. Associated Institution Types

- ☑ 1862 Extension
- ☐ 1862 Research

3a. Outcome Type:

- ◯ Change in Knowledge Outcome Measure
- ◉ Change in Action Outcome Measure
- ◯ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	5000	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- ☑ 703 - Nutrition Education and Behavior
- ☐ 724 - Healthy Lifestyle
- ☐ 806 - Youth Development

Outcome #3

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Based on follow-up surveys of parents of children participating in nutrition education programs, 25 percent of parents will report a family behavior change to be consistent with current recommendations

2. Associated Institution Types

- ☑ 1862 Extension
- ☐ 1862 Research

3a. Outcome Type:

- ◯ Change in Knowledge Outcome Measure
- ◉ Change in Action Outcome Measure
- ◯ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	3000	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- ☑ 703 - Nutrition Education and Behavior
- ☐ 724 - Healthy Lifestyle
- ☑ 806 - Youth Development

Outcome #4

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Based on post-surveys of children involved in multi-session nutrition/fitness classes, 25 percent of participants will report a change in nutrition or fitness behavior to be consistent with current MyPyramid recommendations

2. Associated Institution Types

- ☑ 1862 Extension
- ☐ 1862 Research

3a. Outcome Type:

- ○ Change in Knowledge Outcome Measure
- ◉ Change in Action Outcome Measure
- ○ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	3500	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- ☑ 703 - Nutrition Education and Behavior
- ☑ 724 - Healthy Lifestyle
- ☑ 806 - Youth Development

Outcome #5

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Based on program evaluations, 25 percent of adult participants will demonstrate an increased knowledge and an intent to change nutrition behavior, which may help prevent diabetes or improve disease management.

2. Associated Institution Types

- ☑ 1862 Extension
- ☐ 1862 Research

3a. Outcome Type:

- ◉ Change in Knowledge Outcome Measure
- ◯ Change in Action Outcome Measure
- ◯ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	125	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- ☑ 703 - Nutrition Education and Behavior
- ☑ 724 - Healthy Lifestyle
- ☐ 806 - Youth Development

Outcome #6

1. Outcome Measures

☐ Not Reporting on this Outcome Measure

Number of children in elementary classrooms and afterschool programs targeted with nutrition education programming, with multi-lesson curricula integrating MyPyramid-based nutrition and fitness concepts for grades 3-5, statewide.

2. Associated Institution Types

☑ 1862 Extension
☐ 1862 Research

3a. Outcome Type:

◯ Change in Knowledge Outcome Measure
◉ Change in Action Outcome Measure
◯ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	3100

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Childhood obesity remains an issue of concern in the U.S., with some researchers considering children to be overfed but undernourished. Diseases formerly associated with adults, including heart disease, are becoming more common among children.

What has been done
The overall goal of the "Eat Smart. Play Hard. Together." program is to increase knowledge and change behavior among children and their parents through the use of two curricula in elementary schools and a recognition program used in 4-H clubs. "Banking on Strong Bones" is a five-week, school-based educational intervention for fourth graders. The purpose is to increase knowledge and change behavior regarding calcium-rich foods and weight-bearing activities. "On the Move to Better Health" is a five-week school-based curriculum for fifth graders, which aims to increase fruits, vegetables and calcium-rich foods in the diets of children, as well as increase physical activity. 4-H clubs completed an evaluation process to determine if their club met the "healthy club" criteria.

Results
From 2005-10, the "Banking on Strong Bones" five-lesson program has reached more than 5,900 children and their families. Students improved their knowledge scores and reported positive attitude and behavior changes toward consumption of dairy products. About 1600 fourth graders participated in the 2009-10 school year. On the pre-survey, 49% reported drinking three or more glasses of milk the previous day, compared to 63% on the post-survey. On the pre-survey, 16% reported drinking soda pop every day, compared to 11% on the post-survey. About 88% reported

planned to drink more milk. According to the post-surveys of 1,300 fifth graders in the five-week "On the Move to Better Health" program, about 56% reported increasing the amount of fruits and vegetables they consumed, 56% reported drinking more milk, 60% reported drinking less soda pop, 61% drank more water, 55% chose healthier snacks, and 63% increased the amount of daily physical activity. In 4-H youth programming, 15 4-H clubs from eight counties were recognized for completing at least six of the eight criteria required for recognition as "healthy clubs".

4. Associated Knowledge Areas

- ☑ 703 - Nutrition Education and Behavior
- ☑ 724 - Healthy Lifestyle
- ☑ 806 - Youth Development

Outcome #7

1. Outcome Measures

☐ Not Reporting on this Outcome Measure

Number of older adults (over 45) targeted with the "Eating for Your Eyes" project containing nutrition and health information about the role of nutrition and eye health.

2. Associated Institution Types

- ☑ 1862 Extension
- ☐ 1862 Research

3a. Outcome Type:

- ○ Change in Knowledge Outcome Measure
- ◉ Change in Action Outcome Measure
- ○ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	1190

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
In the United States, approximately 16 million people over the age of 45 report some vision loss. The most debilitating eye diseases include age-related macular degeneration (AMD), glaucoma, cataracts, diabetic retinopathy, retinal detachment and refractive errors. More than 2 million Americans have severe AMD, and another 7 million may have it and not know it. Prevention is important because AMD is the leading cause of irreversible vision loss and greatly reduces the quality of life. Researchers have reported that nutrition, fitness and other lifestyle factors play a role in eye health.

What has been done
"Eating for Your Eyes" is a multimedia teaching kit designed for delivery by trained professionals to adults on the prevention of age-related macular degeneration. The program content was

developed using the research of dietitians and gerontologists with peer review by ophthalmologists and optometrists. Participants used vision simulators to experience various eye conditions. The program is a joint project with the North Dakota Optometric Association. The program has been offered in 36 North Dakota counties and eight other states. Of the 35 trainers completing a program training evaluation, 94% indicated their satisfaction with the program was "above average" or "excellent".

Results

The "Eating for Your Eyes" program is making a difference in the nutrition and eye health of North Dakotans who have received this training. Based on 1,188 participant surveys, 95% reported learning something new, 88% planned to share the information received with family and friends, 54% planned to share vision simulator cards with others, 35% indicated they planned to get a dilated eye exam, 57% planned to wear ultraviolet sunglasses or a hat, 54% planned to get more physical activity, 63% planned to prepare more meals that included green, leafy vegetables, 73% planned to eat colorful fruits and vegetables more often, 61% planned to eat eggs more often, 32% planned to switch from fat-free salad dressing to one with olive or canola oil, and 35% planned to try a new food such as kiwi, orange bell peppers or Swiss chard. According to follow-up contacts with 138 participants from 24 counties, 85% indicated they are currently eating colorful fruits and vegetables more often, 48% had a dilated eye exam, 83% had shared the information with family and friends, and 57% were eating leafy greens more often.

4. Associated Knowledge Areas

- ☑ 703 - Nutrition Education and Behavior
- ☑ 724 - Healthy Lifestyle
- ☐ 806 - Youth Development

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
- ☐ Competing Programmatic Challenges
- ☐ Populations changes (immigration, new cultural groupings, etc.)
- ☐ Other

Brief Explanation

There has been an increased emphasis on managing issues related to obesity and health for youth and ND populations.

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

(OPTIONAL SECTION)

1. Evaluation Studies Planned

- ☐ After Only (post program)
- ☐ Retrospective (post program)
- ☐ Before-After (before and after program)
- ☐ During (during program)
- ☐ Time series (multiple points before and after program)
- ☐ Case Study
- ☑ Comparisons between program participants (individuals, group, organizations) and non-participants
- ☐ Comparisons between different groups of individuals or program participants experiencing different levels of program intensity.
- ☐ Comparison between locales where the program operates and sites without program intervention
- ☐ Other

Evaluation Results

A retrospective study of the Fresh Fruit and Vegetable Program (FFVP) was completed. The goal of the study was to evaluate the effectiveness of a Fresh Fruit and Vegetable Program in two income-eligible schools on participants' fruit and vegetable behavior at school and at home. The evaluation addressed two questions: (1) Did the Fresh Fruit and Vegetable Program affect students' availability of fruits or vegetables in the home, willingness to try or request fruits or vegetables from a parent, or fruit or vegetable consumption throughout the day? (2) Were any of these factors influenced by student age, ethnicity, family income, or gender? During the 2009 to 2010 school year, the intervention school distributed a daily fruit or vegetable snack to all students (kindergarten through grade 5) during the school day. Data were collected in the spring of 2010 from students in grades 3, 4 and 5 and their parents from two schools, one intervention (n=264) and one control (n=326), using a post-only survey. According to the results of the study, the FFVP did not affect students' fruit and vegetable behavior away from school; however, student characteristics such as gender and family income did play a role. A journal article has been submitted for publication. The results of this study will be used to guide nutrition education/obesity-prevention programming in schools.

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 12

1. Name of the Planned Program

Livestock Waste 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
112	Watershed Protection and Management	25%		0%	
133	Pollution Prevention and Mitigation	25%		0%	
403	Waste Disposal, Recycling, and Reuse	50%		0%	
	Total	100%		0%	

Add knowledge area

V(C). Planned Program (Inputs)

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

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Plan	5.0	0.0	0.0	0.0
Actual	5.0	0.0	0.0	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**
160000	0	0	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
240000	0	0	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

•Develop presentation materials
•Develop resource material
•Provide presentations and workshops
•Translate scientific materials into lay materials
•Identify emerging issues
•Evaluate effectiveness of activities

2. Brief description of the target audience

•Owners, managers and employees of animal operations
•Agribusiness and agrifinance personnel
•Government agency personnel

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	400	400	0	0
Actual	900	2000	40	40

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

Patent Applications Submitted

Year: 2010
Plan: 0
Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Plan	2	0	
Actual	2	1	3

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- {No Data Entered}

Not reporting on this Output for this Annual Report

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of individuals requesting information
2	Number of individuals demonstrating increase in subject knowledge and skills
3	Number of individuals implementing recommended action or practice
4	Number of individuals requesting assistance
5	Number of people trained to assist producers with nutrient management planning
6	Number of sub-watersheds where water quality is monitored to determine effectiveness of bmp implementation
7	Number of farmers and individuals who were provided technical assistance in order to become more knowledgeable of manure composting to help gain efficiencies in manure handling while protecting the environment.

Add Cross-cutting Outcome/Impact Statement or Unintended or Previously Unknown Outcome Measure

Outcome #1

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Number of individuals requesting information

2. Associated Institution Types

☑ 1862 Extension
☐ 1862 Research

3a. Outcome Type:

◉ Change in Knowledge Outcome Measure
◯ Change in Action Outcome Measure
◯ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	100	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

☑ 112 - Watershed Protection and Management
☐ 133 - Pollution Prevention and Mitigation
☐ 403 - Waste Disposal, Recycling, and Reuse

Outcome #2

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Number of individuals demonstrating increase in subject knowledge and skills

2. Associated Institution Types

- ☑ 1862 Extension
- ☐ 1862 Research

3a. Outcome Type:

- ◯ Change in Knowledge Outcome Measure
- ◉ Change in Action Outcome Measure
- ◯ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	100	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- ☑ 112 - Watershed Protection and Management
- ☐ 133 - Pollution Prevention and Mitigation
- ☐ 403 - Waste Disposal, Recycling, and Reuse

Outcome #3

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Number of individuals implementing recommended action or practice

2. Associated Institution Types

- ☑ 1862 Extension
- ☐ 1862 Research

3a. Outcome Type:

- ◯ Change in Knowledge Outcome Measure
- ◉ Change in Action Outcome Measure
- ◯ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	40	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- ☐ 112 - Watershed Protection and Management
- ☐ 133 - Pollution Prevention and Mitigation
- ☑ 403 - Waste Disposal, Recycling, and Reuse

Outcome #4

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Number of individuals requesting assistance

2. Associated Institution Types

- ☑ 1862 Extension
- ☐ 1862 Research

3a. Outcome Type:

- ○ Change in Knowledge Outcome Measure
- ◉ Change in Action Outcome Measure
- ○ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	40	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- ☐ 112 - Watershed Protection and Management
- ☑ 133 - Pollution Prevention and Mitigation
- ☐ 403 - Waste Disposal, Recycling, and Reuse

Outcome #5

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Number of people trained to assist producers with nutrient management planning

2. Associated Institution Types

- ☑ 1862 Extension
- ☐ 1862 Research

3a. Outcome Type:

- ○ Change in Knowledge Outcome Measure
- ◉ Change in Action Outcome Measure
- ○ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	50	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- ☐ 112 - Watershed Protection and Management
- ☐ 133 - Pollution Prevention and Mitigation
- ☑ 403 - Waste Disposal, Recycling, and Reuse

Outcome #6

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Number of sub-watersheds where water quality is monitored to determine effectiveness of bmp implementation

2. Associated Institution Types

☑ 1862 Extension
☐ 1862 Research

3a. Outcome Type:

○ Change in Knowledge Outcome Measure
○ Change in Action Outcome Measure
◉ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	3	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

☑ 112 - Watershed Protection and Management
☐ 133 - Pollution Prevention and Mitigation
☐ 403 - Waste Disposal, Recycling, and Reuse

Outcome #7

1. Outcome Measures

☐ Not Reporting on this Outcome Measure

Number of farmers and individuals who were provided technical assistance in order to become more knowledgeable of manure composting to help gain efficiencies in manure handling while protecting the environment.

2. Associated Institution Types

- ☑ 1862 Extension
- ☐ 1862 Research

3a. Outcome Type:

- ◉ Change in Knowledge Outcome Measure
- ◯ Change in Action Outcome Measure
- ◯ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	150

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Livestock producers are constantly looking at ways to gain efficiencies in manure handling while ensuring environmental protection. Livestock producers and those who provide technical assistance to them were interested in adopting manure composting, but lacked the knowledge about the composting process and how to adopt the practice. Therefore, an educational program was developed for producers to help them understand manure composting and encourage them to adopt the practice.

What has been done
A comprehensive manure composting educational program was developed to provide basic understanding of the composting process. Statewide educational programs were delivered in the classroom, on-farm at field days and in one-on-one consultation. Providers of technical information to farmers were also targeted in the educational programs as well as fellow extension educators.

Results
Over 200 people attended field days and workshops focused on manure composting. An extension bulletin on manure composting procedures was developed and a case study developed from North Dakota farms on the energy use efficiencies of handling composted manure versus fresh manure was published as a chapter in a peer reviewed scientific book. In response to the educational program and demand from farmers, three North Dakota soil conservation districts purchased compost turners that are rented or used on a fee basis by farmers and two North Dakota soil conservation districts purchased manure spreaders for farmers to rent. This equipment is being used by over 50 farmers and every farmer that uses the equipment is required to develop and adopt a nutrient management plan. A case study conducted with six participating producers assessed the viability of composting. After interviews, all producers stated they would continue to compost manure even without cost share because they saw significant cost savings in manure handling when composting.

4. Associated Knowledge Areas

- ☑ 112 - Watershed Protection and Management
- ☑ 133 - Pollution Prevention and Mitigation

- ☑ 403 - Waste Disposal, Recycling, and Reuse

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
- ☑ Competing Programmatic Challenges
- ☐ Populations changes (immigration, new cultural groupings, etc.)
- ☐ Other

Brief Explanation

Similar to 2009, North Dakota suffered extensive overland flooding in the spring of 2010. The flooding events forced alternative educational programming which took time away from the planned nutrient management programming.

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

(OPTIONAL SECTION)

1. Evaluation Studies Planned

- ☑ After Only (post program)
- ☐ Retrospective (post program)
- ☐ Before-After (before and after program)
- ☐ During (during program)
- ☐ Time series (multiple points before and after program)
- ☑ Case Study
- ☐ Comparisons between program participants (individuals, group, organizations) and non-participants
- ☐ Comparisons between different groups of individuals or program participants experiencing different levels of program intensity.
- ☐ Comparison between locales where the program operates and sites without program intervention
- ☐ Other

Evaluation Results

During composting educational events, 52 participants were surveyed using a post program evaluation tool. Overall, they ranked the educational material presented very educational with an average ranking of 4.3 on a scale of 1-5 with 5 being very educational. The educational topics they were surveyed on included topics such as, composting regulations, using compost teas, compost equipment management, composting site selection, energy use of composting versus handing fresh manure and weed seed viability in composted manure. The case study was conducted with six producers that were participating in a composting viability project. After interviews, all producers stated they would continue to compost manure even without cost share because they saw significant cost savings in manure handling when composting.

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 13

1. Name of the Planned Program

Citizenship and Leadership Development

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
806	Youth Development	100%		0%	
	Total	100%		0%	

Add knowledge area

V(C). Planned Program (Inputs)

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

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Plan	1.5	0.0	0.0	0.0
Actual	2.0	0.0	0.0	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
64000	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
96000	0	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

• Develop Leadership Training module.
• Contribution module to include how community service leads to belonging, independence, mastery and generosity.
• Future modules on youth involvement, diversity, civic engagement and teamwork.

2. Brief description of the target audience

- 4-H youth

- 4-H youth leaders
- 4-H adult leaders
- County extension staff
- Other community organizations, councils and boards

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	250	1500	400	1500
Actual	265	2000	1100	1000

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

Patent Applications Submitted

Year: 2010
Plan: 0
Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Plan	0	0	
Actual	2	0	2

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- {No Data Entered}

Not reporting on this Output for this Annual Report

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Fifty percent of organized clubs will have someone complete education/training on service to community.
2	Forty percent of clubs will do one or more community service projects.
3	Twenty-five percent of county 4-H leadership will participate in leadership education/training.
4	One hundred community service projects will be reported.
5	Fifty percent of 4-H clubs will participate in leadership education/training.
6	Five percent of leadership of 4-H clubs participating in leadership education/training will report more civic activism.
7	Fifty percent of clubs will report community service projects.
8	Sixty percent of county 4-H clubs will have someone participate in leadership education/training.
9	The number of county 4-H leadership participating in leadership education/training reporting more civic activism will increase.

Add Cross-cutting Outcome/Impact Statement or Unintended or Previously Unknown Outcome Measure

Outcome #1

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Fifty percent of organized clubs will have someone complete education/training on service to community.

2. Associated Institution Types

☑ 1862 Extension
☐ 1862 Research

3a. Outcome Type:

◉ Change in Knowledge Outcome Measure
◯ Change in Action Outcome Measure
◯ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	100	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

☑ 806 - Youth Development

Outcome #2

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Forty percent of clubs will do one or more community service projects.

2. Associated Institution Types

☑ 1862 Extension
☐ 1862 Research

3a. Outcome Type:

◉ Change in Knowledge Outcome Measure
◯ Change in Action Outcome Measure
◯ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	90	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

☑ 806 - Youth Development

Outcome #3

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Twenty-five percent of county 4-H leadership will participate in leadership education/training.

2. Associated Institution Types

☑ 1862 Extension
☐ 1862 Research

3a. Outcome Type:

◉ Change in Knowledge Outcome Measure
◯ Change in Action Outcome Measure
◯ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	50	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

☑ 806 - Youth Development

Outcome #4

1. Outcome Measures

☐ Not Reporting on this Outcome Measure

One hundred community service projects will be reported.

2. Associated Institution Types

☑ 1862 Extension
☐ 1862 Research

3a. Outcome Type:

○ Change in Knowledge Outcome Measure
◉ Change in Action Outcome Measure
○ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	75	206

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Youth and adult volunteers are leaders in the clubs and youth groups that they work with. Group service projects to their communities provide volunteer leaders opportunities to practice leadership and organization skills. 4-H youth development program participants have shown a continued role of leadership and service to community in their adult lives. Community leaders have come to expect 4-H participants to engage in service projects for the benefit of local citizens. The service of youth is noticed by community leaders and the legislature. Volunteers in the 4-H program value the importance of learning how to serve and the participation of their groups in projects which assist communities and people in need. The North Dakota Department of Agriculture started a Hunger Free North Dakota Garden project to assist the local food pantries with locally grown and nutritious food for distribution which has provided another opportunity for service.

What has been done
NDSU Extension Service coordinated Junior Master Gardener projects, which provided an opportunity for each group to give back to the community. Examples of service projects by these groups included planting and caring for flowers at local courthouse and library; developing a wildlife garden; growing and donating vegetables to local food pantry for the Hunger Free North Dakota project; and growing vegetables for use in the hot lunch program and classes in one school. Other 4-H groups continued to do service projects to help people in nursing homes, assisted living facilities, and local hospitals. 246 youth from 33 counties also participated as researchers for a seeds project. They provided valuable input and gained knowledge of how to do research.

Results
As a consequence of NDSU Extension Service programming in leadership development, volunteer youth and adult leaders completed 206 group service projects in at least 34 counties. In addition to leadership development, participants in service to community projects grow in their ability to understand their community, recognize need, plan, and carry out projects that benefit others. The more involved they are in the community, the more ownership they have in their community and its needs. These attitudes and skills benefit them in many other aspects of their lives. More than half of 4-H clubs continue to do service projects as part of their regular yearly agenda. Participants in the Junior Master Gardener program developed gardening skills and indicated a desire to do more gardening on their own and with their families.

4. Associated Knowledge Areas

☑ 806 - Youth Development

Outcome #5

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Fifty percent of 4-H clubs will participate in leadership education/training.

2. Associated Institution Types

☑ 1862 Extension
☐ 1862 Research

3a. Outcome Type:

○ Change in Knowledge Outcome Measure
◉ Change in Action Outcome Measure
○ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	100	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

☑ 806 - Youth Development

Outcome #6

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Five percent of leadership of 4-H clubs participating in leadership education/training will report more civic activism.

2. Associated Institution Types

☑ 1862 Extension
☐ 1862 Research

3a. Outcome Type:

○ Change in Knowledge Outcome Measure
◉ Change in Action Outcome Measure
○ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	10	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

☑ 806 - Youth Development

Outcome #7

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Fifty percent of clubs will report community service projects.

2. Associated Institution Types

☑ 1862 Extension
☐ 1862 Research

3a. Outcome Type:

◯ Change in Knowledge Outcome Measure
◯ Change in Action Outcome Measure
◉ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	75	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

☑ 806 - Youth Development

Outcome #8

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Sixty percent of county 4-H clubs will have someone participate in leadership education/training.

2. Associated Institution Types

- ☑ 1862 Extension
- ☐ 1862 Research

3a. Outcome Type:

- ○ Change in Knowledge Outcome Measure
- ○ Change in Action Outcome Measure
- ◉ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	50	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- ☑ 806 - Youth Development

Outcome #9

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

The number of county 4-H leadership participating in leadership education/training reporting more civic activism will increase.

2. Associated Institution Types

- ☑ 1862 Extension
- ☐ 1862 Research

3a. Outcome Type:

- ○ Change in Knowledge Outcome Measure
- ○ Change in Action Outcome Measure
- ◉ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- ☑ 806 - Youth Development

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
- ☐ Competing Programmatic Challenges
- ☐ Populations changes (immigration, new cultural groupings, etc.)
- ☐ Other

Brief Explanation

Weather and current economic conditions affected the needs of local food pantries and local government expenditures on community beautification projects. The state legislature provided funds to assist Junior Master Gardening programs for curriculum and this helped build momentum. The types of projects depend on factors such as age of the members and what they are capable of, and expressed local needs.

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

(OPTIONAL SECTION)

1. Evaluation Studies Planned

- ☑ After Only (post program)
- ☐ Retrospective (post program)
- ☐ Before-After (before and after program)
- ☐ During (during program)
- ☐ Time series (multiple points before and after program)
- ☐ Case Study

- ☐ Comparisons between program participants (individuals, group, organizations) and non-participants
- ☐ Comparisons between different groups of individuals or program participants experiencing different levels of program intensity.
- ☐ Comparison between locales where the program operates and sites without program intervention
- ☐ Other

Evaluation Results

Comments from program coordinators include statements: "All the participants felt the Junior Master Gardener classes would help them in school." "When the produce was used in the lunchroom, they would point it out to the rest of the students. They really enjoyed the fresh produce."

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 14

1. Name of the Planned Program

Developing Leadership 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
803	Sociological and Technological Change Affecting Individuals, Families, and Communities	50%		0%	
805	Community Institutions, Health, and Social Services	50%		0%	
	Total	100%		0%	

Add knowledge area

V(C). Planned Program (Inputs)

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

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Plan	5.0	0.0	0.0	0.0
Actual	5.0	0.0	0.0	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**
160000	0	0	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
240000	0	0	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

- Rural Leadership North Dakota program
- Horizons project
- Leadership Plenty
- Study Circles
- Ethical Leadership
- Generational Leadership

2. Brief description of the target audience

- Youth
- Schools
- Elected officials
- Community asset builders
- Community collaborators
- Association of Counties
- Service groups
- Governor's office
- Chamber
- Economic developers
- Higher Education
- SBARE
- RLND
- Soil Conservation Districts

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	2000	1300	200	100
Actual	38237	547457	1912	27373

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

Patent Applications Submitted

Year: 2010
Plan: 0
Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Plan	1	0	
Actual	3	0	3

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- {No Data Entered}

Not reporting on this Output for this Annual Report

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of community members including youth who display leadership skills sets.
2	Number of community members including youth who understand how they can be involved in leadership roles
3	Number of people from diverse backgrounds involved in leadership activities.
4	Number of community projects being accomplished and reported on
5	Number of community plans and projects being developed and accomplished within those rural North Dakota communities.

Add Cross-cutting Outcome/Impact Statement or Unintended or Previously Unknown Outcome Measure

Outcome #1

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Number of community members including youth who display leadership skills sets.

2. Associated Institution Types

☑ 1862 Extension
☐ 1862 Research

3a. Outcome Type:

◉ Change in Knowledge Outcome Measure
◯ Change in Action Outcome Measure
◯ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	400	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

☑ 803 - Sociological and Technological Change Affecting Individuals, Families, and
☑ 805 - Community Institutions, Health, and Social Services

Outcome #2

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Number of community members including youth who understand how they can be involved in leadership roles

2. Associated Institution Types

- ☑ 1862 Extension
- ☐ 1862 Research

3a. Outcome Type:

- ◉ Change in Knowledge Outcome Measure
- ◯ Change in Action Outcome Measure
- ◯ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	400	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- ☑ 803 - Sociological and Technological Change Affecting Individuals, Families, and
- ☑ 805 - Community Institutions, Health, and Social Services

Outcome #3

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Number of people from diverse backgrounds involved in leadership activities.

2. Associated Institution Types

- ☑ 1862 Extension
- ☐ 1862 Research

3a. Outcome Type:

- ◉ Change in Knowledge Outcome Measure
- ◯ Change in Action Outcome Measure
- ◯ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual

2010	32	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- ☑ 803 - Sociological and Technological Change Affecting Individuals, Families, and
- ☑ 805 - Community Institutions, Health, and Social Services

Outcome #4

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Number of community projects being accomplished and reported on

2. Associated Institution Types

- ☑ 1862 Extension
- ☐ 1862 Research

3a. Outcome Type:

- ○ Change in Knowledge Outcome Measure
- ◉ Change in Action Outcome Measure
- ○ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	40	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- ☑ 803 - Sociological and Technological Change Affecting Individuals, Families, and
- ☑ 805 - Community Institutions, Health, and Social Services

Outcome #5

1. Outcome Measures

☐ Not Reporting on this Outcome Measure

Number of community plans and projects being developed and accomplished within those rural North Dakota communities.

2. Associated Institution Types

- ☑ 1862 Extension
- ☐ 1862 Research

3a. Outcome Type:

- ○ Change in Knowledge Outcome Measure
- ○ Change in Action Outcome Measure
- ◉ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	34

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The foundation of community and economic development in North Dakota is local leadership, including the identification and development of current and emerging leaders, programs to strengthen leadership, and local capacity to enhance community self-sufficiency. These leaders work to sustain and grow rural North Dakota communities in a variety of ways but specific community projects help get many community members involved to impact public policy and potentially change the environment or the economy of their town.

What has been done
Two major programs help transform rural North Dakota communities:
1) The Horizons program develops leaders who work to increase assets and build prosperity. In addition, these community leaders learn information and gain the necessary understanding to take action on public policy and issues, including environmental concerns. Communities are working hard on housing issues.
2) The Rural Leadership North Dakota (RLND) Program prepares and develops effective leaders to strengthen rural North Dakota during an 18-month leadership development experience. RLND participants complete community projects during their experience. RLND Short-course participants complete a 20-hour leadership program. Short course participants work on community projects as part of their experience.

Results

Multiple projects are in progress or completed in rural North Dakota towns. Impactful examples include: 1) More than $2 million in grant funds and donations have been secured by Horizons communities that have funded community gardens, walking trails, feasibility studies and the arts. 2) Eight Horizons communities reported an increase in community people running for public offices. 3) Many Horizons communities are positively impacting their local environment by planting trees, shrubs, flowers and gardens, cleaning up city blight and decay, and developing several beautification and improvement projects. 4) Twelve Horizon communities have secured grants related to housing studies, housing rehabilitation projects, school renovations for lodging and rentals, and new construction projects. 5) RLND Class IV participants improved the quality of life for North Dakotans by raising funds to have weather radar in SW North Dakota available year round; starting a high school leadership program in Dickinson; starting a recycling program in Medora; assisting senior citizens in changing smoke alarm batteries in Bismarck; and starting a BBQ restaurant in Williston. 6) Watford RLND Short Course participants improved the quality of life through local projects including; creating a group to help new residents get connected in the city, expanding the local wellness center, offering healthy cooking classes and establishing a community garden.

4. Associated Knowledge Areas

- ☑ 803 - Sociological and Technological Change Affecting Individuals, Families, and
- ☑ 805 - Community Institutions, Health, and Social Services

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
- ☐ Competing Programmatic Challenges
- ☑ Populations changes (immigration, new cultural groupings, etc.)
- ☑ Other (People not knowing where to go for help)

Brief Explanation

Economy - individuals in North Dakota are often living with fewer resources and must get creative with resource procurement. Public policy changes - rural communities are frustrated, concerned and want to have a voice about policies and funding formulas that affect their town. Competing public priorities - even with a strong economy, there are limitations on what the public system can provide for individual communities. Population change - elderly population growing and oil boom workers increasing are depleting housing resources. People not knowing where to go for help - NDSU Extension can provide help to rural communities so they know what resources might be available for these community projects, building a network across the state.

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

(OPTIONAL SECTION)

1. Evaluation Studies Planned

- ☐ After Only (post program)
- ☐ Retrospective (post program)
- ☑ Before-After (before and after program)
- ☑ During (during program)
- ☐ Time series (multiple points before and after program)
- ☐ Case Study
- ☐ Comparisons between program participants (individuals, group, organizations) and non-participants
- ☐ Comparisons between different groups of individuals or program participants experiencing different levels of program intensity.
- ☐ Comparison between locales where the program operates and sites without program intervention
- ☑ Other (Blogging)

Evaluation Results

Evaluation - see results section above.

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 15

1. Name of the Planned Program

Financial Security for All

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
801	Individual and Family Resource Management	100%		0%	
	Total	100%		0%	

Add knowledge area

V(C). Planned Program (Inputs)

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

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Plan	3.0	0.0	0.0	0.0
Actual	3.0	0.0	0.0	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**
96000	0	0	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
144000	0	0	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

•Promote Interactive learning modules
•Packaged programs
•NDSU Extension Service Family Economics Web site

•Media work
•Collaborative projects

2. Brief description of the target audience

•Extension educators
•Specialists
•General public
•Targeted audiences - Baby Boomers, women, couples, farm/ranch
•Families - older adults
•Collaborators
•Youth
•Financially vulnerable

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	2600	160000	2000	9500
Actual	4000	200000	2400	10000

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

Year: 2010
Plan: 0
Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Plan	2	1	
Actual	5	2	7

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- {No Data Entered}

Not reporting on this Output for this Annual Report

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of educational programs and activities conducted
2	Number of people completing educational programs
3	Number of people reporting increased knowledge from the number completing educational programs
4	Number of people who plan to adopt practices from the number of people who increased knowledge
5	Number of people adopting practices from the number of people who increased knowledge
6	Number of people receiving information through non-program contacts such as telephone, office and farm visits
7	Number of people who participate in programs to cope with financial impacts of reduced income
8	Decreased numbers of personal bankruptcy filings in state of North Dakota
9	Number of ND high school educators trained on the new financial planning curriculum in order to comply with new state high school graduation requirements.

Add Cross-cutting Outcome/Impact Statement or Unintended or Previously Unknown Outcome Measure

Outcome #1

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Number of educational programs and activities conducted

2. Associated Institution Types

☑ 1862 Extension
☐ 1862 Research

3a. Outcome Type:

◉ Change in Knowledge Outcome Measure
◯ Change in Action Outcome Measure
◯ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	200	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

☑ 801 - Individual and Family Resource Management

Outcome #2

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Number of people completing educational programs

2. Associated Institution Types

- ☑ 1862 Extension
- ☐ 1862 Research

3a. Outcome Type:

- ◉ Change in Knowledge Outcome Measure
- ◯ Change in Action Outcome Measure
- ◯ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	150	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- ☑ 801 - Individual and Family Resource Management

Outcome #3

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Number of people reporting increased knowledge from the number completing educational programs

2. Associated Institution Types

- ☑ 1862 Extension
- ☐ 1862 Research

3a. Outcome Type:

- ◉ Change in Knowledge Outcome Measure
- ◯ Change in Action Outcome Measure
- ◯ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	120	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

☑ 801 - Individual and Family Resource Management

Outcome #4

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Number of people who plan to adopt practices from the number of people who increased knowledge

2. Associated Institution Types

☑ 1862 Extension
☐ 1862 Research

3a. Outcome Type:

◉ Change in Knowledge Outcome Measure
◯ Change in Action Outcome Measure
◯ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	20	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

☑ 801 - Individual and Family Resource Management

Outcome #5

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Number of people adopting practices from the number of people who increased knowledge

2. Associated Institution Types

☑ 1862 Extension
☐ 1862 Research

3a. Outcome Type:

○ Change in Knowledge Outcome Measure
◉ Change in Action Outcome Measure
○ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	10	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

☑ 801 - Individual and Family Resource Management

Outcome #6

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Number of people receiving information through non-program contacts such as telephone, office and farm visits

2. Associated Institution Types

☑ 1862 Extension
☐ 1862 Research

3a. Outcome Type:

○ Change in Knowledge Outcome Measure
◉ Change in Action Outcome Measure
○ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	1200	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

☑ 801 - Individual and Family Resource Management

Outcome #7

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Number of people who participate in programs to cope with financial impacts of reduced income

2. Associated Institution Types

☑ 1862 Extension
☐ 1862 Research

3a. Outcome Type:

○ Change in Knowledge Outcome Measure
◉ Change in Action Outcome Measure
○ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	600	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

☑ 801 - Individual and Family Resource Management

Outcome #8

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Decreased numbers of personal bankruptcy filings in state of North Dakota

2. Associated Institution Types

☑ 1862 Extension
☐ 1862 Research

3a. Outcome Type:

○ Change in Knowledge Outcome Measure
○ Change in Action Outcome Measure
◉ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	70	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

☑ 801 - Individual and Family Resource Management

Outcome #9

1. Outcome Measures

☐ Not Reporting on this Outcome Measure

Number of ND high school educators trained on the new financial planning curriculum in order to comply with new state high school graduation requirements.

2. Associated Institution Types

☑ 1862 Extension
☐ 1862 Research

3a. Outcome Type:

◉ Change in Knowledge Outcome Measure
◯ Change in Action Outcome Measure
◯ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	102

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
It has been identified that young adults need to increase their financial knowledge and skills to increase their ultimate capacity to contribute to society. Numerous national surveys have demonstrated that graduating high school seniors continue to struggle with financial literacy basics. Financial illiteracy isn't new, but the consequences have become more severe, because people now have to take so much responsibility for their financial lives. Pensions have been replaced with 401(k)s; many workers have to buy their own health insurance; and technology has brought many new changes and challenges for consumers. In response, North Dakota has initiated a Personal Finance Education requirement for students graduating in 2011 or later.

What has been done
NDSU Extension Service has long been involved in the National Endowment for Financial Education's High School Financial Planning Program to develop and deliver training and resources. The state specialist was part of the North Dakota Personal Finance Curriculum Committee to help identify and develop resources to aid educators. Two state wide, interactive trainings were conducted for educators, and a 2 hour presentation was given to educators at the InvestND Teachers Academy. Lesson Plans were developed to teach the required information using the High School Financial Planning Program.

Results
Over 100 North Dakota Educators were trained on the financial planning curriculum and to the lesson plans. These teachers represent approximately 40% of the high schools in North Dakota. With this training, these educators have the knowledge and resources to effectively teach high school students on the financial aspects of topics such as saving, spending, wise use of credit,

and the value of post-secondary education. The training increased the educator's knowledge and skills so they were more confident in teaching and have greater access to current and unbiased resources. Most educators have used the Financial Planning Program materials to meet the North Dakota Personal Finance standards and have shared the materials with other educators. Consequently, the educators will be able to teach approximately 7,000 high school students annually to fulfill the new state graduation requirements. Overall, increased financial competency will lead to financial literacy, and the ability to make wise financial decisions that affect their lifetime financial stability.

4. Associated Knowledge Areas

- ☑ 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
- ☐ Competing Public priorities
- ☐ Competing Programmatic Challenges
- ☐ Populations changes (immigration, new cultural groupings, etc.)
- ☐ Other

Brief Explanation

There are new ND Personal Finance Mandates for graduating seniors, beginning in 2011.

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

(OPTIONAL SECTION)

1. Evaluation Studies Planned

- ☑ After Only (post program)
- ☑ Retrospective (post program)
- ☐ Before-After (before and after program)
- ☐ During (during program)
- ☐ Time series (multiple points before and after program)
- ☐ Case Study
- ☐ Comparisons between program participants (individuals, group, organizations) and non-participants
- ☐ Comparisons between different groups of individuals or program participants experiencing

different levels of program intensity.

- ☐ Comparison between locales where the program operates and sites without program intervention
- ☐ Other

Evaluation Results

An evaluation was conducted approximately 6-8 months following the training for feedback on the program. A follow-up evaluation will be conducted at the end of the school year. The participants in the first evaluation indicated that the class structure was convenient, the materials were well prepared, the activities and assignments helped them apply what they learned, the instructors facilitated group participation, and the course materials were easy to understand (ratings 4.44-4.70 on a scale of 1-5).

As a result of participating in the training, the participants felt more comfortable teaching personal finance (all ratings from a 1-5 scale), 4.2; more confident (4.0), have access to current and unbiased resources (4.9); are more aware of resources (4.7), have used the HSFPP materials to meet the ND Personal Finance standards (4.33), and have shared the materials with other educators (4.22).

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 16

1. Name of the Planned Program

Noxious and Invasive Weed 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
213	Weeds Affecting Plants	20%		0%	
215	Biological Control of Pests Affecting Plants	40%		0%	
216	Integrated Pest Management Systems	40%		0%	
	Total	100%		0%	

Add knowledge area

V(C). Planned Program (Inputs)

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

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Plan	4.0	0.0	0.0	0.0
Actual	4.0	0.0	0.0	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**
128000	0	0	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
192000	0	0	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

•Develop presentation materials
•Develop resource material
•Provide workshops and field tours
•Translate scientific materials into lay materials
•Develop demonstration and research trials
•Evaluate effectiveness of activities

2. Brief description of the target audience

•Private land managers, including livestock producers
•Public land managers
•4-H youth
•Government agency personnel
•Conservation groups

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	325	3500	125	600
Actual	342	10000	94	535

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

Patent Applications Submitted

Year: 2010
Plan: 0
Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Plan	1	1	
Actual	1	1	2

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- {No Data Entered}

Not reporting on this Output for this Annual Report

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of individuals receiving training and education
2	Number of individuals demonstrating increase in subject knowledge and skills
3	Number of producers implementing recommended actions or practices
4	Number of producers participating in government cost share programs for range conservation
5	Estimated cost savings and return for North Dakota landowners implementing an integrated pest management program ($/acre)
6	Reduce number of noxious weed acres by two to five percent annually in North Dakota
7	Number of people participating in educational training on innovative and contemporary/new methods of Canada thistle control in ND.

Add Cross-cutting Outcome/Impact Statement or Unintended or Previously Unknown Outcome Measure

Outcome #1

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Number of individuals receiving training and education

2. Associated Institution Types

☑ 1862 Extension
☐ 1862 Research

3a. Outcome Type:

◉ Change in Knowledge Outcome Measure
◯ Change in Action Outcome Measure
◯ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	300	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

☑ 213 - Weeds Affecting Plants
☑ 215 - Biological Control of Pests Affecting Plants
☑ 216 - Integrated Pest Management Systems

Outcome #2

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Number of individuals demonstrating increase in subject knowledge and skills

2. Associated Institution Types

- ☑ 1862 Extension
- ☐ 1862 Research

3a. Outcome Type:

- ◉ Change in Knowledge Outcome Measure
- ◯ Change in Action Outcome Measure
- ◯ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	60	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- ☑ 213 - Weeds Affecting Plants
- ☑ 215 - Biological Control of Pests Affecting Plants
- ☑ 216 - Integrated Pest Management Systems

Outcome #3

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Number of producers implementing recommended actions or practices

2. Associated Institution Types

- ☑ 1862 Extension
- ☐ 1862 Research

3a. Outcome Type:

- ◯ Change in Knowledge Outcome Measure
- ◉ Change in Action Outcome Measure
- ◯ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	25	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- ☑ 213 - Weeds Affecting Plants
- ☑ 215 - Biological Control of Pests Affecting Plants
- ☑ 216 - Integrated Pest Management Systems

Outcome #4

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Number of producers participating in government cost share programs for range conservation

2. Associated Institution Types

- ☑ 1862 Extension
- ☐ 1862 Research

3a. Outcome Type:

- ○ Change in Knowledge Outcome Measure
- ◉ Change in Action Outcome Measure
- ○ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	25	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- ☐ 213 - Weeds Affecting Plants
- ☑ 215 - Biological Control of Pests Affecting Plants
- ☑ 216 - Integrated Pest Management Systems

Outcome #5

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Estimated cost savings and return for North Dakota landowners implementing an integrated pest management program ($/acre)

2. Associated Institution Types

- ☑ 1862 Extension
- ☐ 1862 Research

3a. Outcome Type:

- ○ Change in Knowledge Outcome Measure
- ○ Change in Action Outcome Measure
- ◉ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	4	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- ☐ 213 - Weeds Affecting Plants
- ☑ 215 - Biological Control of Pests Affecting Plants
- ☑ 216 - Integrated Pest Management Systems

Outcome #6

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Reduce number of noxious weed acres by two to five percent annually in North Dakota

2. Associated Institution Types

☑ 1862 Extension
☐ 1862 Research

3a. Outcome Type:

○ Change in Knowledge Outcome Measure
○ Change in Action Outcome Measure
◉ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	3	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

☐ 213 - Weeds Affecting Plants
☑ 215 - Biological Control of Pests Affecting Plants
☑ 216 - Integrated Pest Management Systems

Outcome #7

1. Outcome Measures

☐ Not Reporting on this Outcome Measure

Number of people participating in educational training on innovative and contemporary/new methods of Canada thistle control in ND.

2. Associated Institution Types

- ☑ 1862 Extension
- ☐ 1862 Research

3a. Outcome Type:

- ◉ Change in Knowledge Outcome Measure
- ◯ Change in Action Outcome Measure
- ◯ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	106

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Ranchers, public land managers, recreation enthusiasts, and the North Dakota Dept. of Agriculture have a vested interest in reducing the Canada thistle in North Dakota. Canada thistle has become North Dakota's number one noxious weed, in terms of acreage, reducing the carrying capacity of range and pasture land for livestock production, recreational value for wildlife habitat, esthetic value of our public lands, and overall ecological integrity of the natural resource. Canada thistle is listed on North Dakota's noxious weed list and must be controlled. This enforcement lies with the North Dakota Department of Agriculture and is regulated through the North Dakota Weed Association. They are obligated to enforce the control and spread of Canada thistle, providing action plans, monetary incentives, and people to manage this weed.

What has been done
Over the last 2 years, a minimum of two meetings per year were held for North Dakota stakeholders to provide input on educational priorities for that year. The stakeholders help identify the subject matter and evaluation tools. North Dakota State Extension Service, in collaboration with the North Dakota Department of Agriculture, has provided training sessions for those individuals who have the greatest potential to impact a local community. We created a series of one-day sessions at four locations in North Dakota to train key individuals. Our intended audiences were local educators, weed board members, state and federal land managers, and county agents that could directly impact 1.5 to 2 million acres.

Results
We have trained an average of 98 people who have a direct influence on the noxious weed control of range, pasture and roadside right-of-ways in North Dakota. These training opportunities had a direct impact on approximately 7,000 acres of hay land in 2009 that were certified as weed-seed free hay. This direct impact created an indirect impact by not infesting public lands with noxious weed seed, thus potentially retarding the spread of weed seed on 70,000 acres of public land. This proactive approach to controlling noxious weed seed spread prevented a future expense of weed control by $875,000. In 2010, the educational program provided top-down impact on 1.1 million acres. Our goal was to reduce Canada thistle by 4% over the next 2 years, improving the economic, recreational and esthetic value of over 40,000 acres. This impact would save the state land managers over $900,000 in chemical expenditures per year, reduce pesticide impacts on the land and water by 4%, and increase carrying capacity for livestock 10%, or 375 animal units at an increase annual value of $281,000 to our rancher community.

4. Associated Knowledge Areas

- ☑ 213 - Weeds Affecting Plants
- ☑ 215 - Biological Control of Pests Affecting Plants
- ☑ 216 - Integrated Pest Management Systems

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
- ☐ Competing Programmatic Challenges
- ☐ Populations changes (immigration, new cultural groupings, etc.)
- ☐ Other

Brief Explanation

Government policies have actually been a benefit at increasing the awareness of noxious weeds and forcing regulation and control. New laws and appropriated dollars have helped create the opportunities for stakeholders to meet and create educational opportunities. Many of the participants are required to attend the workshops, thus creating an environment of need and understanding of the issues.

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

(OPTIONAL SECTION)

1. Evaluation Studies Planned

- ☐ After Only (post program)
- ☑ Retrospective (post program)
- ☑ Before-After (before and after program)
- ☐ During (during program)
- ☐ Time series (multiple points before and after program)
- ☐ Case Study
- ☐ Comparisons between program participants (individuals, group, organizations) and non-participants
- ☐ Comparisons between different groups of individuals or program participants experiencing different levels of program intensity.
- ☐ Comparison between locales where the program operates and sites without program intervention

☐ Other

Evaluation Results

The North Dakota Department of Agriculture conducts annual surveys on noxious weed infestation levels, allowing us to track changes. Our educational opportunities are the primary tool used to educate local professionals and public land managers. Based on market prices, chemical prices and labor, we can track the economic impact of a program by monitoring noxious weed populations (changes +/-) through time.

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 17

1. Name of the Planned Program

Fusarium head blight of wheat

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
212	Pathogens and Nematodes Affecting Plants	100%		100%	
	Total	100%		100%	

Add knowledge area

V(C). Planned Program (Inputs)

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

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Plan	1.5	0.0	2.0	0.0
Actual	1.5	0.0	2.0	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**
48000	0	75400	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
72000	0	113000	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

•Research on fungicidal- and bio-control and application technology
•Field surveys on disease severity and losses to disease
•Develop resource material

•Provide presentations and workshops
•Translate scientific materials into lay materials

2. Brief description of the target audience

•Wheat and barley producers
•Crop consultants and ag advisors
•Research Extension Centers
•Extension personnel
•Agribusiness and agrifinance personnel
•Government agency personnel

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	6000	15000	0	0
Actual	10000	15000	0	0

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

Year: 2010
Plan: 0
Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Plan	1	1	
Actual	1	1	2

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- {No Data Entered}

Not reporting on this Output for this Annual Report

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Percent of acres planted to resistant varieties
2	Percent of acres treated with fungicides
3	Economic losses to disease ($)
4	Number of individuals demonstrating increased knowledge and skills
5	Number of individuals implementing recommended action or practice
6	Estimated dollar value of adopted best management practices ($)
7	Stable export market unaffected by quality issues ($)
8	Number of consultants and producers trained on the use of two new tools for 2010: ScabSmart and FHB Alerts.

Add Cross-cutting Outcome/Impact Statement or Unintended or Previously Unknown Outcome Measure

Outcome #1

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Percent of acres planted to resistant varieties

2. Associated Institution Types

☑ 1862 Extension
☑ 1862 Research

3a. Outcome Type:

◉ Change in Knowledge Outcome Measure
◯ Change in Action Outcome Measure
◯ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	55	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

☑ 212 - Pathogens and Nematodes Affecting Plants

Outcome #2

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Percent of acres treated with fungicides

2. Associated Institution Types

☑ 1862 Extension
☑ 1862 Research

3a. Outcome Type:

◉ Change in Knowledge Outcome Measure
◯ Change in Action Outcome Measure
◯ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	14	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

☑ 212 - Pathogens and Nematodes Affecting Plants

Outcome #3

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Economic losses to disease ($)

2. Associated Institution Types

☑ 1862 Extension
☑ 1862 Research

3a. Outcome Type:

◉ Change in Knowledge Outcome Measure
◯ Change in Action Outcome Measure
◯ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	100000000	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

☑ 212 - Pathogens and Nematodes Affecting Plants

Outcome #4

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Number of individuals demonstrating increased knowledge and skills

2. Associated Institution Types

☑ 1862 Extension
☑ 1862 Research

3a. Outcome Type:

◉ Change in Knowledge Outcome Measure
◯ Change in Action Outcome Measure
◯ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	17000	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

☑ 212 - Pathogens and Nematodes Affecting Plants

Outcome #5

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Number of individuals implementing recommended action or practice

2. Associated Institution Types

☑ 1862 Extension
☑ 1862 Research

3a. Outcome Type:

◯ Change in Knowledge Outcome Measure
◉ Change in Action Outcome Measure
◯ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	13000	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

☑ 212 - Pathogens and Nematodes Affecting Plants

Outcome #6

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Estimated dollar value of adopted best management practices ($)

2. Associated Institution Types

☑ 1862 Extension
☑ 1862 Research

3a. Outcome Type:

◯ Change in Knowledge Outcome Measure
◯ Change in Action Outcome Measure
◉ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	85000000	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

☑ 212 - Pathogens and Nematodes Affecting Plants

Outcome #7

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Stable export market unaffected by quality issues ($)

2. Associated Institution Types

☑ 1862 Extension
☑ 1862 Research

3a. Outcome Type:

◯ Change in Knowledge Outcome Measure
◯ Change in Action Outcome Measure
◉ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	565000000	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

☑ 212 - Pathogens and Nematodes Affecting Plants

Outcome #8

1. Outcome Measures

☐ Not Reporting on this Outcome Measure

Number of consultants and producers trained on the use of two new tools for 2010: ScabSmart and FHB Alerts.

2. Associated Institution Types

☑ 1862 Extension
☐ 1862 Research

3a. Outcome Type:

◯ Change in Knowledge Outcome Measure
◉ Change in Action Outcome Measure
◯ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	1000

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
North Dakota consultants and wheat producers need to access decision tools to optimize their management decisions of Fusarium head blight (FHB = scab). ND wheat producers have suffered severe yield and quality losses from a fungal disease called Fusarium head blight (FHB = scab). On the 9 million acres of spring wheat, durum wheat and winter wheat grown in the state, approximately 1/3 of the acreage is at risk every year from this disease, in areas with higher rainfall and more saturated soils. Significant research and extension efforts have sought management solutions for this disease, and today, producers have more resistant varieties available, better fungicides for reducing the disease and its associated toxin, and have a disease forecasting system available to identify the risk of the disease during the critical growth stages of the crop.

What has been done

In 2010, Extension made available a new website on scab management, called ScabSmart, www.scabsmart.org, an internet site about scab management developed at NDSU with funding from the US Wheat and Barley Scab Initiative, which provides updated and straight forward information on best varieties for resistance, fungicide efficacy, crop rotations, and disease forecasting. In 2010, we also made FHB alerts available, to be "pushed" to emails or smartphones. These FHB alerts provided short messages at times and locations of critical risks of infection as determined by the FHB forecasting model. If infection risk was high, wheat producers could react by applying efficacious fungicides to reduce the disease and the toxin.

Results
ND wheat producers used the information provided on ScabSmart, FHB alerts, and also from information provided through traditional means, such as the NDSU Crop and Pest Report, county ag alerts, and the AgDakota listserve. They responded when FHB risks were high during the susceptible growth stage of wheat, flowering. The most efficacious fungicides were applied to 1.2 million acres because of forecast risks. Average wheat yield response was 15% or between 7.5 and 10 bu/acre of yield was protected from loss. If 9 bu/acre is used as the average yield increase and using a conservative price of $7/bu, the gross return was $63/acre and the net return was $40/acre on 1.2 million acres. The total net return in North Dakota was $48 million, based on yield response alone. Additional protection of the food quality was achieved with reductions of vomitoxin to safe levels in harvested wheat grain.

4. Associated Knowledge Areas

- ☑ 212 - Pathogens and Nematodes Affecting Plants

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
- ☐ Competing Programmatic Challenges
- ☐ Populations changes (immigration, new cultural groupings, etc.)
- ☐ Other

Brief Explanation

High prices of wheat and lower prices of fungicide also made fungicide protection against FHB more economical.

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

(OPTIONAL SECTION)

1. Evaluation Studies Planned

- ☐ After Only (post program)
- ☐ Retrospective (post program)
- ☐ Before-After (before and after program)
- ☑ During (during program)
- ☐ Time series (multiple points before and after program)
- ☐ Case Study
- ☐ Comparisons between program participants (individuals, group, organizations) and non-participants
- ☐ Comparisons between different groups of individuals or program participants experiencing different levels of program intensity.
- ☐ Comparison between locales where the program operates and sites without program intervention
- ☐ Other

Evaluation Results

An analysis of hits on the ScabSmart web site indicated about 1000 ND producers using site, and the number of sign-ups for FHB alerts indicated ND residents had the highest number of participants across US. Three NDSU faculty, Drs. G. McKee, J. Ransom, and M. McMullen, also surveyed ND producers on their reasons or determinants of adoption of scab management techniques. Results were presented at the 2010 US Wheat and Barley Scab Initiative National Forum in December, 2010. The largest percentage (35.3%) of farmers used three techniques, variety resistance, fungicides, and crop rotations.

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 18

1. Name of the Planned Program

Family Meals

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
802	Human Development and Family Well-Being				
	Total				

Add knowledge area

V(C). Planned Program (Inputs)

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

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Plan	3.0	0.0	0.0	0.0
Actual	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}

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

Extension		Research	
Smith-Lever 3b & 3c	**1890 Extension**	**Hatch**	**Evans-Allen**
{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}

V(D). Planned Program (Activity)

1. Brief description of the Activity

The activities of this program have been reported under 'Childhood Obesity,' program #11, as presented to and approved by NIFA staff in February of 2010.

2. Brief description of the target audience

The activities of this program have been reported under 'Childhood Obesity,' program #11, as presented to and approved by NIFA staff in February of 2010.

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	2500	7500	1400	2500
Actual	0	0	0	0

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

Patent Applications Submitted

Year: 2010
Plan: 0
Actual: {No Data

Patents listed
{No Data Entered}

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Plan	1	0	
Actual	1	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- {No Data Entered}

Not reporting on this Output for this Annual Report

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Percent of participating individuals demonstrating increase in subject knowledge and skills
2	Percent of individuals implementing recommended actions or practices
3	Percent of individuals indicating a change in frequency of family meals.
4	Percent of individuals indicating a change in other quality indicators of the family meal experience
5	Percent of individuals showing an improvement in measures of family connection and well-being
6	Percent of individuals showing an improvement in family nutritional wellness.
7	Number of individuals receiving information through materials or training

Add Cross-cutting Outcome/Impact Statement or Unintended or Previously Unknown Outcome Measure

Outcome #1

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Percent of participating individuals demonstrating increase in subject knowledge and skills

2. Associated Institution Types

☑ 1862 Extension
☐ 1862 Research

3a. Outcome Type:

◉ Change in Knowledge Outcome Measure
◯ Change in Action Outcome Measure
◯ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	75	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

☑ 802 - Human Development and Family Well-Being

Outcome #2

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Percent of individuals implementing recommended actions or practices

2. Associated Institution Types

☑ 1862 Extension
☐ 1862 Research

3a. Outcome Type:

◯ Change in Knowledge Outcome Measure
◉ Change in Action Outcome Measure
◯ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	60	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

☑ 802 - Human Development and Family Well-Being

Outcome #3

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Percent of individuals indicating a change in frequency of family meals.

2. Associated Institution Types

☑ 1862 Extension
☐ 1862 Research

3a. Outcome Type:

◯ Change in Knowledge Outcome Measure
◉ Change in Action Outcome Measure
◯ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	60	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

☑ 802 - Human Development and Family Well-Being

Outcome #4

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Percent of individuals indicating a change in other quality indicators of the family meal experience

2. Associated Institution Types

☑ 1862 Extension
☐ 1862 Research

3a. Outcome Type:

○ Change in Knowledge Outcome Measure
◉ Change in Action Outcome Measure
○ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	60	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

☑ 802 - Human Development and Family Well-Being

Outcome #5

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Percent of individuals showing an improvement in measures of family connection and well-being

2. Associated Institution Types

☑ 1862 Extension
☐ 1862 Research

3a. Outcome Type:

◯ Change in Knowledge Outcome Measure
◯ Change in Action Outcome Measure
◉ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	50	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

☑ 802 - Human Development and Family Well-Being

Outcome #6

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Percent of individuals showing an improvement in family nutritional wellness.

2. Associated Institution Types

☑ 1862 Extension
☐ 1862 Research

3a. Outcome Type:

○ Change in Knowledge Outcome Measure
○ Change in Action Outcome Measure
◉ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	50	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

☑ 802 - Human Development and Family Well-Being

Outcome #7

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Number of individuals receiving information through materials or training

2. Associated Institution Types

☑ 1862 Extension
☐ 1862 Research

3a. Outcome Type:

◉ Change in Knowledge Outcome Measure
○ Change in Action Outcome Measure
○ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	14000	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- ☑ 802 - Human Development and Family Well-Being

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
- ☐ Competing Programmatic Challenges
- ☐ Populations changes (immigration, new cultural groupings, etc.)
- ☑ Other (PROG #18 REVISED TO REPORT UNDER PROG #11, 'Childhood Obesity')

Brief Explanation

The activities of this program have been reported under 'Childhood Obesity,' program #11, as presented to and approved by NIFA staff in February of 2010.

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

(OPTIONAL SECTION)

1. Evaluation Studies Planned

- ☐ After Only (post program)
- ☐ Retrospective (post program)
- ☐ Before-After (before and after program)
- ☐ During (during program)
- ☐ Time series (multiple points before and after program)
- ☐ Case Study
- ☐ Comparisons between program participants (individuals, group, organizations) and non-participants
- ☐ Comparisons between different groups of individuals or program participants experiencing different levels of program intensity.

- ☐ Comparison between locales where the program operates and sites without program intervention
- ☑ Other (PROG #18 REVISED TO RPT UNDER PROG #11 'Childhood Obesity')

Evaluation Results

The activities of this program have been reported under 'Childhood Obesity,' program #11, as presented to and approved by NIFA staff in February of 2010.

Key Items of Evaluation

The activities of this program have been reported under 'Childhood Obesity,' program #11, as presented to and approved by NIFA staff in February of 2010.

V(A). Planned Program (Summary)

Program # 19

1. Name of the Planned Program

Parent Education - Parents Forever

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
802	Human Development and Family Well-Being	100%		100%	
	Total	100%		100%	

Add knowledge area

V(C). Planned Program (Inputs)

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

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Plan	6.0	0.0	1.0	0.0
Actual	6.0	0.0	1.0	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**
192000	0	37700	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
288000	0	56500	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

•Develop educational resources on healthy parenting and child development.
•Develop presentation and resource materials for staff members and community professionals.
•Provide training and education through seminars and workshops.

•Identify key and emerging issues to address.
•Evaluate the effectiveness of activities.

2. Brief description of the target audience

•Parents and family caregivers
•Child care programs
•School system personnel
•Government agency
•Personnel community workers and professionals

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	300	3500	0	0
Actual	312	7500	0	0

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

Year: 2010
Plan: 0
Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Plan	1	1	
Actual	1	1	2

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- {No Data Entered}

Not reporting on this Output for this Annual Report

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Percent of individuals demonstrating increase in subject knowledge and skills
2	Percent of individuals implementing recommended actions or practices.
3	Percent of individuals indicating a change in frequency of specified parenting practices.
4	Percent of individuals indicating a change in other quality indicators of parent-child relationships.
5	Number of individuals receiving information through materials or training.
6	Percent of parents experiencing divorce or separation that gained new skills as a result of the Parents Forever program.

Add Cross-cutting Outcome/Impact Statement or Unintended or Previously Unknown Outcome Measure

Outcome #1

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Percent of individuals demonstrating increase in subject knowledge and skills

2. Associated Institution Types

☑ 1862 Extension
☑ 1862 Research

3a. Outcome Type:

◉ Change in Knowledge Outcome Measure
◯ Change in Action Outcome Measure
◯ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	80	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

☑ 802 - Human Development and Family Well-Being

Outcome #2

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Percent of individuals implementing recommended actions or practices.

2. Associated Institution Types

☑ 1862 Extension
☑ 1862 Research

3a. Outcome Type:

◯ Change in Knowledge Outcome Measure
◉ Change in Action Outcome Measure
◯ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	60	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

☑ 802 - Human Development and Family Well-Being

Outcome #3

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Percent of individuals indicating a change in frequency of specified parenting practices.

2. Associated Institution Types

☑ 1862 Extension
☑ 1862 Research

3a. Outcome Type:

◯ Change in Knowledge Outcome Measure
◉ Change in Action Outcome Measure
◯ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	60	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

☑ 802 - Human Development and Family Well-Being

Outcome #4

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Percent of individuals indicating a change in other quality indicators of parent-child relationships.

2. Associated Institution Types

☑ 1862 Extension
☑ 1862 Research

3a. Outcome Type:

○ Change in Knowledge Outcome Measure
○ Change in Action Outcome Measure
◉ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	60	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

☑ 802 - Human Development and Family Well-Being

Outcome #5

1. Outcome Measures

☑ Not Reporting on this Outcome Measure

Number of individuals receiving information through materials or training.

2. Associated Institution Types

☑ 1862 Extension
☑ 1862 Research

3a. Outcome Type:

◉ Change in Knowledge Outcome Measure
◯ Change in Action Outcome Measure
◯ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	5600	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

☑ 802 - Human Development and Family Well-Being

Outcome #6

1. Outcome Measures

☐ Not Reporting on this Outcome Measure

Percent of parents experiencing divorce or separation that gained new skills as a result of the Parents Forever program.

2. Associated Institution Types

- ☑ 1862 Extension
- ☑ 1862 Research

3a. Outcome Type:

- ○ Change in Knowledge Outcome Measure
- ◉ Change in Action Outcome Measure
- ○ Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	312

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
In programs for adults experiencing separation or divorce, parents can learn to cope with their feelings, communicate with their former spouse and children, and learn about specific things to help children through the transition. Effective parent and family education is intended to benefit families who may be facing distress or difficulty and enable them to activate those capacities that will aid them in the coping and adjustment process. Parents experiencing the pain of separation and divorce need knowledge, support and resources to provide them with guidance on healthy parenting in the midst of divorce. Parent education interventions can provide assistance to parents undergoing family transitions.

What has been done
The NDSU Extension Service adopted the Parents Forever divorce education program. Program facilitators, community partners and extension educators deliver a 4-hour portion of Parents Forever, focusing on the impact of divorce on children. In North Dakota, the program is administered regionally through the NDSU Extension Service and is regularly delivered in 4-hour educational sessions to divorcing or never-married parents. Participants in the single-session Parents Forever class offered in North Dakota receive instruction and discuss grief and loss issues for children, child responses to divorce based on developmental levels, parental communication concerns, helpful parental responses to child concerns, and strategies for managing conflict and improving communication between parents. Seven sites with a total of 312 participants were involved in the program in the past year.

Results
The 312 adult participants in the single-session program of Parents Forever indicated high levels of satisfaction and strong perceptions of the program's value to them. Asked whether they felt the class was worthwhile for them, 85% of attendees strongly agreed or agreed that they did perceive it as worthwhile. In addition, 90% of participants strongly agreed or agreed that the class would be beneficial for all divorcing parents. When asked if they would recommend participation in the program to someone else, 98% of participants noted that they would recommend the course to another person. Study findings indicated statistically significant increases between retrospective pre-program and post-program positive divorce-related behaviors (mean scores) for participants in all areas assessed. The largest behavior changes were reported in communicating successfully with the other parent about issues and in controlling angry or negative responses to the other parent. Also, participants rated the program as of equal or greater value to them than 11 other

sources of information on divorce adjustment and co-parenting.

4. Associated Knowledge Areas

- ☑ 802 - Human Development and Family Well-Being

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
- ☐ Competing Programmatic Challenges
- ☐ Populations changes (immigration, new cultural groupings, etc.)
- ☑ Other (No specific external factors affected the outcomes.)

Brief Explanation

No specific external factors affected the program other than typical societal pressures and personality traits that result in divorce.

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

(OPTIONAL SECTION)

1. Evaluation Studies Planned

- ☐ After Only (post program)
- ☑ Retrospective (post program)
- ☑ Before-After (before and after program)
- ☐ During (during program)
- ☐ Time series (multiple points before and after program)
- ☐ Case Study
- ☐ Comparisons between program participants (individuals, group, organizations) and non-participants
- ☑ Comparisons between different groups of individuals or program participants experiencing different levels of program intensity.
- ☐ Comparison between locales where the program operates and sites without program intervention
- ☐ Other

Evaluation Results

Fifty-three percent of class participants were female and the remainder were male (45%). At the time of class participation, current relationship status of participants included considering separation or divorce (2.7%), separated from partner (2.7 %), in the divorce process (43%), and completed the divorce process (34%). Additionally, 14% of respondents were never married to the child's other parent at the time of class participation.

The largest behavior changes were reported in communicating successfully with the other parent about issues (M = 2.58 before program versus M = 3.17 after program), and in controlling angry or negative responses to the other parent (M = 3.34 before program versus M = 3.92 after program).

Key Items of Evaluation