

V(A). Planned Program (Summary)

Program # 4

1. Name of the Planned Program

Global Food Security and Hunger, Crop, Livestock and Horticulture Systems

Reporting on this Program

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	5%		5%	
111	Conservation and Efficient Use of Water	5%		5%	
202	Plant Genetic Resources	5%		5%	
204	Plant Product Quality and Utility (Preharvest)	5%		5%	
205	Plant Management Systems	10%		10%	
211	Insects, Mites, and Other Arthropods Affecting Plants	5%		5%	
212	Pathogens and Nematodes Affecting Plants	5%		5%	
213	Weeds Affecting Plants	5%		5%	
214	Vertebrates, Mollusks, and Other Pests Affecting Plants	5%		5%	
216	Integrated Pest Management Systems	5%		5%	
301	Reproductive Performance of Animals	5%		5%	
302	Nutrient Utilization in Animals	5%		5%	
305	Animal Physiological Processes	5%		5%	
307	Animal Management Systems	10%		10%	
311	Animal Diseases	5%		5%	
502	New and Improved Food Products	5%		5%	
601	Economics of Agricultural Production and Farm Management	5%		5%	
704	Nutrition and Hunger in the Population	5%		5%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2012	Extension		Research	
	1862	1890	1862	1890

Plan	26.0	0.0	30.0	0.0
Actual Paid Professional	21.0	0.0	18.9	0.0
Actual Volunteer	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
323302	0	867990	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
323302	0	867990	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

Any or all channels of the media will be used to familiarize the public with UW College of Agriculture and Natural Resources areas of research and extension programming and personnel. Newsletter articles distributed both electronically and through the mail by county offices, area teams, and the University of Wyoming will reach producers locally, regionally, and statewide. Public educational programs by extension specialists and educators presenting research-based information will be held in response to local, state, and national crop and livestock production, horticultural and nutrition issues. Demonstrations of technology and skills training will be included in education curriculum to enhance educational effectiveness. Field tours will be organized to provide producers with the opportunity to observe improved sustainable agricultural practices.

Areas of focus in livestock systems emphasis will be placed on the four main areas: herd management, herd development, cropping systems and livestock development, risk and operation management techniques and alternatives to enhance the stability of Wyoming livestock producers. Fostering development of local food systems, which includes promoting use of local foods, can improve energy efficiency of the food system while yielding many other benefits. UW Extension plans to enhance efficiency within local food systems by improving relationships among local food producers and consumers in Wyoming.

- development and pilot-testing of *Wyoming Local Food Expos* in at least two communities; development and distribution of the *Wyoming Local Foods Guide* (print and electronic versions) which will include a directory of specialty crops and other local food products, nutrition and food safety resources, recipes for using local foods, factsheets related to local foods in Wyoming, and tips on sustainable living. The *Foods Guide* will be uniquely Wyoming but will draw from several existing examples.

- development and implementation of a training module to provide UW Extension educators statewide with the knowledge and skills to successfully promote local foods.

EFNEP adult curriculum taught in a series of lessons; adult one-time lessons; youth curricula taught in a series of lessons and day camps; displays and demonstrations; state and community partnerships with agencies serving the low-income; training for educators; evaluation of program; ongoing-updating of curricula and materials.

Other nutrition efforts will focus on educational programs; media outreach; health fairs; training; assessment and data collection; and research in human health and disease .

2. Brief description of the target audience

The University of Wyoming is committed to reaching underrepresented groups and individuals and to implementing the objectives of equal opportunity regulations relative to the consideration and treatment of clientele for participation in programs regardless of their race, national origin, gender, age, religion, or disability. All efforts will be made to provide information through direct contact and through publications, newsletters, Web sites and other methods. The general public and exurban landowners, agricultural producers and specific target audience groups for the CNP (EFNEP) program: low-income adults, youth in Title I schools.

3. How was eXtension used?

eXtension is used as a resource in Wyoming. The link to eXtension is prominently displayed on the UW Extension Web site home page. In addition, professional development opportunities through eXtension are publicized to Extension employees.

V(E). Planned Program (Outputs)

1. Standard output measures

2012	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	7808	90000	2128	5000

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

Patent Applications Submitted

Year: 2012
 Actual: 1

Patents listed

21USP1: Method for Reducing Protein Misfolding in Cells, 3/30/12

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2012	Extension	Research	Total
Actual	3	56	59

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of educational programs focusing on global food security and hunger, crop, livestock, or horticulture systems. Target is the number of programs.

Year	Actual
2012	481

Output #2

Output Measure

- Number of participants attending programs focusing on global food security and hunger, livestock, crop, and horticulture systems. Target is the number of individual participants

Year	Actual
2012	9936

Output #3

Output Measure

- Number of partnerships formed with other agencies, or organizations and volunteers integrated into programs. Target is the number of partnerships and/or volunteers.

Year	Actual
2012	50

Output #4

Output Measure

- Increased adoption of sustainable agriculture methods and practices which result in increased production of the food supply. Target is 10 to 20% of total Wyoming Ag Operations participants reporting outcome.

Year	Actual
2012	4500

Output #5

Output Measure

- Research: Number of research publications, bulletins, reports, and presentations on crop, livestock, and horticulture systems. Target is number of outputs reported.

Year	Actual
2012	224

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Increased knowledge of agriculture producers on sustainable cropping and livestock systems. Target is number of producers reporting outcome.
2	Improved sustainable agriculture production practices resulting in an increased food supply. Outcome is number of producers reporting outcome.
3	Awareness created through extension and research efforts. Target is number of participants in extension and research programs reporting that they have gained awareness on topic.
4	Wyoming producers will benefit through an increased value of livestock and crops related to improved cropping practices, herd selection, and management. Target is number of producers reporting positive outcome as a result of educational efforts.
5	Research: Transfer knowledge and increase awareness of research on crop, livestock, and horticulture systems. Target is number of projects reporting outcome.

Outcome #1

1. Outcome Measures

Increased knowledge of agriculture producers on sustainable cropping and livestock systems.
Target is number of producers reporting outcome.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	9936

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The value of agriculture to Wyoming's economy approaches \$1 billion each year, and agriculture's contribution to open spaces, wildlife, and recreation is even greater. Livestock and crop producers throughout the state of Wyoming face an ever changing industry with issues such as; increasing cost of production, increasing pressure focused on land conversion, changing requirements for marketing knowledge. All of the issues are coupled with the need for producers to be able to raise agricultural products in a sustainable operation with limited resources.

What has been done

Extension Educators in Profitable and Sustainable Agriculture Systems conducted 481 educational programs including field days, workshops, classes, multi-session courses, and volunteer training. In addition media is utilized to reach citizens through television, newspaper inserts, magazines, news columns and special articles, and radio. Educators also write educational newsletters distributed by mail and on line. Five local food expos were implemented in 2012 and training conducted for educators to expand expos statewide.

Results

Formal and informal evaluations were used to determine outcome. 100 percent of agriculture producers participating in educational activities reported increased awareness on Global Food Security, Hunger, Crop, Livestock, and Horticulture Systems.

Written evaluations of the Ranch Practicum School Profitability and Sustainability following the comprehensive eight day course reported:

Nineteen participants indicated knowledge gained would influence 76 people, management for 10,800 beef cattle and 404,000 acres of land. Producers who attended the class reported the class resulted in \$160,535 improvement in net income to their operations in total.

94% would be likely or very likely to use cow body condition as a management tool.

88% would be likely or very likely to use decision making skills gained to help them make management decisions.
94% reported that they would be likely or very likely to improve range management or natural resource management.
96% indicated they gained moderate to significant knowledge in 25 specific area related to ranch production and management.

4. Associated Knowledge Areas

KA Code	Knowledge Area
204	Plant Product Quality and Utility (Preharvest)
307	Animal Management Systems
502	New and Improved Food Products

Outcome #2

1. Outcome Measures

Improved sustainable agriculture production practices resulting in an increased food supply.
Outcome is number of producers reporting outcome.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	4500

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The value of agriculture to Wyoming's economy approaches \$1 billion each year, and agriculture's contribution to open spaces, wildlife, and recreation is even greater. The largest component of Wyoming agriculture is the beef cattle industry, accounting for approximately 70 percent of all cash receipts and 86.5 percent of all livestock production. Sheep, lamb, and wool receipts in 1998 were \$29 million. Forage sustains the Wyoming livestock industry. Hay is the leading crop in Wyoming with 1998 production valued at \$185 million, mostly marketed through livestock. Crop producers across Wyoming are challenged with increasing production costs, global market competition, environmental pressure, and decreased labor availability. Alternative markets, improved management practices, and cost efficiency is critical to ensure profitability and sustainability for Wyoming producers. Irrigation is a key factor identified by UW Extension area advisory committees and AES advisory groups.

What has been done

UW Extension educators conducted 481 classes, workshops, tours on crop, livestock, and horticulture systems targeting Wyoming producers and landowners. In addition, educators published articles in local newspapers, newsletters, special newspaper inserts and discussed the topic on radio programs. Topics included pasture management, introduction to irrigation, and the Wyoming Water Conference, and Wyoming Water Association tour. The Master Cattleman Class, which met weekly for eight weeks, provided 24 hours of classroom instruction. Over a three year period classes have been held in all five areas of the state. Horticulture programs are conducted throughout the state with Master Gardener programs implemented in 15 of the 23 counties.

Results

Participants indicated through formal and informal evaluations that they increased confidence in decision making skills necessary to make needed management decisions. Producers reported increased knowledge and awareness of pasture conditions. 4500 participants in educational activities reported gaining knowledge and awareness of resources and methods of irrigation and cost related to each method. End of 2012 program evaluations reported:

85 percent gained knowledge of production strategies

90 percent gained knowledge of enterprise analysis and risk management

100 percent plan to implement one or more ideas

While participants are hesitant to provide a specific dollar value to impact of their ranches.

Reasons for this hesitancy ranged from "it depends on the market" and "it's too early to tell". Eight producers indicated specific dollar values ranging from \$1000 to \$30,000 for a total of \$101,000 with the average being \$12,625. Sixteen of the ranchers indicated that they now utilize partial budgeting to help in the decision making process.

4. Associated Knowledge Areas

KA Code	Knowledge Area
204	Plant Product Quality and Utility (Preharvest)
307	Animal Management Systems
502	New and Improved Food Products

Outcome #3

1. Outcome Measures

Awareness created through extension and research efforts. Target is number of participants in extension and research programs reporting that they have gained awareness on topic.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	9936

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

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Results

Formal and informal evaluations were used to determine outcome. 100 percent of agriculture producers participating in educational activities reported increased awareness on Global Food Security, Hunger, Crop, Livestock, and Horticulture Systems.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
111	Conservation and Efficient Use of Water
202	Plant Genetic Resources
204	Plant Product Quality and Utility (Preharvest)

205	Plant Management Systems
211	Insects, Mites, and Other Arthropods Affecting Plants
212	Pathogens and Nematodes Affecting Plants
213	Weeds Affecting Plants
214	Vertebrates, Mollusks, and Other Pests Affecting Plants
216	Integrated Pest Management Systems
301	Reproductive Performance of Animals
302	Nutrient Utilization in Animals
305	Animal Physiological Processes
307	Animal Management Systems
311	Animal Diseases
502	New and Improved Food Products
601	Economics of Agricultural Production and Farm Management
704	Nutrition and Hunger in the Population

Outcome #4

1. Outcome Measures

Wyoming producers will benefit through an increased value of livestock and crops related to improved cropping practices, herd selection, and management. Target is number of producers reporting positive outcome as a result of educational efforts.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

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What has been done

Extension Educators in Profitable and Sustainable Agriculture Systems conducted 481 educational programs including field days, workshops, classes, multi-session courses, and volunteer training. In addition media is utilized to reach citizens through television, newspaper inserts, magazines, news columns and special articles, and radio.

Educators also write educational newsletters distributed by mail and on line. Five local food expos were conducted in each area of the state and training conducted for educators to expand expos statewide.

Results

Formal and informal evaluations were used to determine outcome. Written evaluations of the Ranch Practicum School Profitability and Sustainability following the comprehensive eight day course reported:

Nineteen participants indicated knowledge gained would influence 76 people, management for 10,800 beef cattle and 404,000 acres of land. Producers who attended the class reported the class resulted in \$160,535 improvement in net income to their operations in total.

Master Cattleman, a comprehensive five week course reported, 100 percent plan to implement one or more ideas learned in the class.

While participants are hesitant to provide a specific dollar value to impact of their ranches.

Reasons for this hesitancy ranged from "it depends on the market" and "it's too early to tell". Eight producers indicated specific dollar values ranging from \$1000 to \$30,000 for a total of \$101,000 with the average being \$12,625. Sixteen of the ranchers indicated that they now utilize partial budgeting to help in the decision making process.

4. Associated Knowledge Areas

KA Code	Knowledge Area
204	Plant Product Quality and Utility (Preharvest)
205	Plant Management Systems
301	Reproductive Performance of Animals
307	Animal Management Systems
601	Economics of Agricultural Production and Farm Management

Outcome #5

1. Outcome Measures

Research: Transfer knowledge and increase awareness of research on crop, livestock, and horticulture systems. Target is number of projects reporting outcome.

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	27

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The United States has historically been the largest investor in the world in public agricultural research and development, and the leading country in terms of intellectual outputs such as publications and patents related to the agricultural sciences; however, this once dominant position has eroded substantially because of a variety of factors, most prominently a reduction in the rate of growth of research funding in the United States in recent decades. This reduction has coincided with a slowdown in the productivity of U.S. agriculture. The primary focus of this research involves an examination of how investments in agricultural research increase agricultural productivity and generate economic returns. A clear understanding of the relationship between agricultural research and the benefits that result is critical to insuring an adequate food supply, especially for poor and disadvantaged communities.

What has been done

Development of comprehensive data resources required to measure agricultural productivity and the economic return to research in agriculture. These include data on agricultural production and productivity, as well as data on public and private investments in agricultural research and development. The data were used to estimate the economic return to research, which helps to justify these critically important investments.

Results

The impact has been an acknowledgement by the scientific community that U.S. agricultural productivity has been slowing in recent decades because of a reduction in the growth of public spending on agricultural R&D. This research has also resulted in a rescaling of the estimated rate of return to public investments in R&D from approximately 50 percent per year to 10 percent per year. A 10 percent real rate of return represents a solid investment opportunity that policymakers can use to help justify these critical investments.

4. Associated Knowledge Areas

KA Code	Knowledge Area
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111	Conservation and Efficient Use of Water
202	Plant Genetic Resources
204	Plant Product Quality and Utility (Preharvest)
205	Plant Management Systems
211	Insects, Mites, and Other Arthropods Affecting Plants
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216	Integrated Pest Management Systems
301	Reproductive Performance of Animals
302	Nutrient Utilization in Animals
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311	Animal Diseases
502	New and Improved Food Products
601	Economics of Agricultural Production and Farm Management
704	Nutrition and Hunger in the Population

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

Brief Explanation

Many conditions and situations that exist in Wyoming are similar to those in other parts of the country, for example, the following:

- Food choices made available and advertised to consumers by producers
- Access to timely and accurate information
- Coordination and cooperation of federal agencies and state partners
- Existence of local collaboration
- Level of funding at federal, state and local level
- Willingness of private sector-funders, such as corporations, foundations, and community organizations, to collaborate with the University of Wyoming Extension.

Weather extremes and drought may affect producers in agriculture or horticulture issues. Funding is vital to this program; changes in appropriations could impact funding. Additionally, global market changes impact both research and extension programs in profitable and sustainable agriculture.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Systematic evaluation utilizing a variety of methods was used to document outcomes and impact to clientele. This program includes four focuses: global food security and hunger, livestock systems; crop systems; and urban horticulture. Each focus has developed a logic model which includes specific evaluation plans and methods. Educational activities use written evaluations following the program, as follow-up; pre-and post -test to measure knowledge and aspirations. Follow-up evaluations either by mail, phone, or

personal visit document medium and long term outcomes.

Multiple methods were used. Sampling was utilized to gather evaluative data from media education efforts. Surveys, by mail, telephone, or on-site were used with program participants. Observation and unstructured interviews were used to determine medium to long term outcomes. Tests including pre- and post- were utilized to measure knowledge gained.

100% of participants indicated increasing knowledge, awareness and skills. Over half of respondents of evaluation surveys indicated aspirations to implement practices that would be an improvement.

Over 90% of individuals enrolling in the master gardener program complete the course and pass the certification test.

Key Items of Evaluation

100% of participants indicated increasing knowledge, awareness and skills. Over half of respondents of evaluation surveys indicated aspirations to implement practices that would be an improvement.

Over 90% of individuals enrolling in the master gardener program complete the course and pass the certification test.