

**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	Diseases 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%	
	<b>Total</b>	100%		100%	

**V(C). Planned Program (Inputs)**

1. Actual amount of FTE/SYs expended this Program

Year: 2014	Extension		Research	
	1862	1890	1862	1890
<b>Plan</b>	24.0	0.0	21.2	0.0
<b>Actual Paid</b>	24.0	0.0	18.9	0.0
<b>Actual Volunteer</b>	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
383100	0	899294	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
383100	0	899294	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 and crop 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 implementation 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.

**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.

**3. How was eXtension used?**

eXtension is utilized as a resource for educators and clientele. The University of Wyoming Extension Web site prominently displays the eXtension link on the home page. Additionally, professional development opportunities through eXtension are publicized for Extension employees. UW Extension participates in "Ask an Expert". Educators and specialists respond to clientele questions submitted through eXtension.

**V(E). Planned Program (Outputs)**

**1. Standard output measures**

2014	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Actual</b>	40145	300000	864	100000

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

**Patent Applications Submitted**

Year: 2014  
 Actual: 0

**Patents listed**

**3. Publications (Standard General Output Measure)**

**Number of Peer Reviewed Publications**

2014	Extension	Research	Total
<b>Actual</b>	15	32	47

**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.

<b>Year</b>	<b>Actual</b>
2014	245

### **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

<b>Year</b>	<b>Actual</b>
2014	40145

### **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.

<b>Year</b>	<b>Actual</b>
2014	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.

<b>Year</b>	<b>Actual</b>
2014	2500

### **Output #5**

#### **Output Measure**

- Research publications, bulletins, reports, and presentations on crop, livestock, and horticulture systems.

<b>Year</b>	<b>Actual</b>
2014	87

**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	Increase appreciation of research on plant production systems. Target is the number of projects reporting on this outcome.
6	Increase appreciation of research on animal production systems. Target is the number of projects reporting on this 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**

<b>Year</b>	<b>Actual</b>
2014	40145

### **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 245 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. Three local food expos were implemented in 2014.

#### **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:

Forty-nine participants indicated knowledge gained would influence, management for 17,000 beef cattle and 636,000 acres of land. Producers who attended the class reported the class resulted in

\$440,000 improvement in net income to their operations in total.  
40% showed greater increase in time using cow body condition as a management tool.  
25% increased their use decision making skills gained to help them make management decisions.  
80% indicated they gained moderate to significant knowledge in 25 specific area related to ranch production and management.  
70% increased long term profitability and productivity of their cattle enterprises.

Master Gardeners assisted in extending skills and disseminating information to 34,050 contacts and recorded over 10,562.5 volunteer hours contributing \$213,073.93 to Wyoming Horticulture outreach efforts.

#### 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
2014	4000

##### 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 245 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, and introduction to irrigation, Wyoming Master Stockman ? Ranch Management Institute, which met for 3 days in 4 locations, provided 24 hours of classroom instruction. Master Sheep Producer course was implemented in 2014 in three locations. Horticulture programs are conducted throughout the state with Master Gardener programs implemented in 17 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. 4000 participants in educational activities reported gaining knowledge and awareness of resources and methods of production and sustainability. End of 2014 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. Sixteen of the ranchers indicated that they now utilize partial budgeting to help in the decision making process.

Wyoming Master Stockman ? Ranch Management Institute which was held for 3 days in four locations across the state.

Participants at the completed programs in the four Wyoming locations evaluated the program. ?Participants were asked if the information was useful for their ranching operation. 65 percent strongly agreed and 35 percent agreed.

?Participants were also asked if they would use tools or concepts taught in the program to make decisions on their ranch. 100 percent indicated that they would use the tools.

?Participants were asked to estimate the value created from attending this program. All participants indicated value was created and 88 percent of the participants indicated that more than \$3500 in value was gained from attending this program.

?100 percent indicated they would recommend the program to other producers.

#### **4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
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**

<b>Year</b>	<b>Actual</b>
2014	247

#### **3c. Qualitative Outcome or Impact Statement**

##### **Issue (Who cares and Why)**

Current cattle prices are stimulating national expansion. Many producers are considering retaining additional heifers to sell next summer as bred heifers.

Additionally, UW Extension strives to increase awareness not only with agriculture produces, but also citizens statewide. Advisory input consistently identifies the need to reach non-agriculture audiences and youth to increase knowledge on where the food supply comes from and to encourage careers in agriculture.

##### **What has been done**

An analysis was conducted to determine the costs of over-wintering and breeding heifers to meet the summer bred heifer market.

In addition to the 245 educational programs presented by UW Extension, newspaper inserts, TV spots on urban horticulture, and other media efforts are used to increase awareness.

##### **Results**

Results showed that given the high value of calves this fall, a far less risky and almost as profitable option was to sell all calves not needed by the ranch for replacements this fall.

Extension evaluations, both formal and informal indicate participants have gained awareness of topics covered; media efforts continue to bring new audiences to extension for information.

#### **4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
301	Reproductive Performance of Animals
302	Nutrient Utilization in Animals
307	Animal Management Systems
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**

<b>Year</b>	<b>Actual</b>
2014	400

##### **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 245 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. Master Wool Grower was implemented. The project was accomplished through five, 4-hour workshop sessions at two Wyoming locations. Wyoming Master Stockman ? Ranch Management Institute was implemented

in four locations, each holding three day institutes. The objective of this project was to enhance the sustainability of Wyoming ranchers. Producers received training on ranch assessment, financial enterprise analysis, stochastic planning tools, and action plans. Participants were provided with these tools on a sub-notebook computer so that they were able to continually utilize the concepts and tools taught.

### **Results**

#### **Master Wool Grower:**

Participants who completed programs in the three Wyoming locations evaluated the program. Participants were asked if they had used tools or concepts taught in the program to make decisions on their ranches. Ninety-three percent indicated they had used the tools. Participants were asked to estimate the value created from attending this program. All participants indicated value was created, and 60 percent of the participants indicated more than \$5,000 in value gained.

#### **Wyoming Master Stockman - Ranch Management Institute:**

Participants at the completed programs in the four Wyoming locations evaluated the program. Participants were asked if the information was useful for their ranching operation. 65 percent strongly agreed and 35 percent agreed.

Participants were also asked if they would use tools or concepts taught in the program to make decisions on their ranch. 100 percent indicated that they would use the tools.

Participants were asked to estimate the value created from attending this program. All participants indicated value was created and 88 percent of the participants indicated that more than \$3500 in value was gained from attending this program.

100 percent indicated they would recommend the program to other producers.

## **4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
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**

Increase appreciation of research on plant production systems. Target is the number of projects reporting on this outcome.

### **2. Associated Institution Types**

- 1862 Research

### 3a. Outcome Type:

Change in Knowledge Outcome Measure

### 3b. Quantitative Outcome

Year	Actual
2014	12

### 3c. Qualitative Outcome or Impact Statement

#### Issue (Who cares and Why)

Grape production in Wyoming evinces strong interest from producers seeking viable alternatives to traditional crops, and from homeowners with backyard plantings.

#### What has been done

Grapevine evaluation trials were established at Sheridan and Powell to find cultivars that will perform well under diverse conditions of soil and climate. Improvement of existing cultivars and rootstocks via precision breeding will enhance genetics without potentially altering existing desirable characteristics.

#### Results

The final result will be the development of improved genetic resources and a package of production practices for grapevine cultivation in Wyoming.

### 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
216	Integrated Pest Management Systems
502	New and Improved Food Products
601	Economics of Agricultural Production and Farm Management
704	Nutrition and Hunger in the Population

## **Outcome #6**

### **1. Outcome Measures**

Increase appreciation of research on animal production systems. Target is the number of projects reporting on this outcome.

### **2. Associated Institution Types**

- 1862 Research

### **3a. Outcome Type:**

Change in Knowledge Outcome Measure

### **3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2014	9

### **3c. Qualitative Outcome or Impact Statement**

#### **Issue (Who cares and Why)**

Feed efficiency is a trait of economic importance to livestock producers because improvements can translate to lower feed inputs and/or enhanced stocking rates. Identification of feed efficient animals is time- and cost-intensive hampering trait improvement.

#### **What has been done**

Our research suggests that rumen microbial populations can be used to identify the most feed efficient ewe lambs.

#### **Results**

Development of a 'microbial index' to predict or infer feed efficiency would enable producers to better select feed efficient breeding stock and ultimately potentially improve profits.

### **4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
302	Nutrient Utilization in Animals
305	Animal Physiological Processes
307	Animal Management Systems
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.

## **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. 212 Master Gardeners in 17 counties reported 10,562.5 volunteer hours, 2,552 continuing education hours, and 34,050 contacts. The value of volunteer time as documented by the independent sector shows that MG volunteers contribute \$244,627.50 to the Extension program in Wyoming.

**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. The value of volunteer time as documented by the independent sector shows that MG volunteers contribute \$244,627.50 to the Extension program in Wyoming.