

# 2013 Langston University Combined Research and Extension Annual Report of Accomplishments and Results

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## I. Report Overview

### 1. Executive Summary

Langston University's Research and Extension Programs work collaboratively to make a positive difference in the lives of stakeholders in Oklahoma, the nation and globally. The three major areas being reported on for 2013 are Goat Research/Extension; Aquaculture Research/Extension; 4-H and Youth Development and Family & Consumer Sciences.

Goat Research at the University is conducted through the American Institute for Goat Research. The scope of the small ruminant research being performed includes Angora, meat and dairy goats. Nutrition studies are primarily oriented toward determining the nutrient requirements of goats with special emphasis on the high-producing dairy goat. Research is being conducted with goat milk and the development of value-added products from milk. During 2013, research and extension personnel worked collaboratively to put on goat artificial insemination clinics. These clinics allow goat producers to use superior animals to improve the genetic composition of their goat breeding stocks. In 2013, three artificial insemination workshops were conducted. The workshops had 47 participants. In order to provide effective training, workshops are limited to a manageable number. Other goat research and extension efforts included enhanced dairy herd improvement, internal parasite control for small ruminants, web-based training and international collaborations. Records indicate that over 2,200 goat producers have enrolled in the web-based on-line certification program and 285 goat producers have been certified via the site. Research findings from the institute are incorporated into fact sheets which are distributed by our Extension Program. Data are often summarized in articles in the quarterly newsletter. In addition, research results are published in appropriate journals for goat research, including The Journal of Animal Sciences, Small Ruminant Research, Journal of Dairy Science, Canadian Journal of Animal Science, Sheep and Goat Research Journal and Animal Feed Sciences and Technology.

Aquaculture Research and Extension Programs provide technology needed by Oklahoma Aquaculturists, pond owners and others. Materials provided by these programs assist producers and enthusiasts in properly managing fish farms and ponds in a profitable and ecologically sustainable manner. Research is being conducted with alternative aquaculture species to test the profitability of additional fish species for Oklahoma producers. During 2013, research and extension personnel had face-to-face contact with fish producers during workshops, site visits, meetings, and at the University's Annual Aquaculture Field Day. Information was shared from our studies which show bigmouth buffalo as a potential alternative fish species for Oklahoma producers. The Aquaculture Water Gardens Program gave presentations to stakeholders interested in developing and or managing ornamental ponds. Information was presented at the annual meeting of the Kansas Aquaculture Association, the Langston University Aquaculture Field Day, and during group sessions. A book on ornamental ponds drafted in 2008 was used to provide best management practices to assist stakeholders in the construction and maintenance of ornamental ponds. Research and extension work from the Phytoplankton Program provided information to fish producers to help them reduce the off-flavors in their catfish by controlling phytoplankton levels in their ponds.

4-H and Youth Development and Family & Consumer Sciences provide needed programs to youth and families in Oklahoma. Langston University's Cooperative Extension Program views the youth population of Oklahoma as one of the state's most important resources. A learning-by-doing approach is used to enable youth to develop the knowledge, attitudes, and skills they need to become competent, caring, and contributing citizens of our society. Today's young people are living in an exciting time; with an increasingly diverse society, new technologies, and expanding opportunities. Two challenges facing many

of our youth are deficiencies in reading and mathematics. Helping youth to develop and maintain high skill levels in these areas is being addressed by the Youth Development Unit at Langston University. The Extended Education Program includes a youth summer program offered to students in Pre-kindergarten through Fifth Grade (ages 5-11). In 2013, sixty-eight youth participated in the program. After six weeks of training 100% demonstrated an improvement in reading comprehension and 100% showed improvement in understanding mathematical concepts and operations. This summer program helps youth maintain math and reading skills over the summer months and positions them to achieve well when school starts in the fall. During 2013, the Science, Engineering and Technology (SET) Program was used to supplement our Extended Education and Food and Nutrition Programs. SET activities reached over 800 youth and enhanced their knowledge of the agricultural, biological and related sciences.

Program areas included in this Executive Summary play vital roles in reaching and making a difference in the lives of youth, families, producers, consumers and citizens in the State of Oklahoma.

**Total Actual Amount of professional FTEs/SYs for this State**

Year: 2013	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	18.0	0.0	22.0
Actual	0.0	15.0	0.0	28.0

**II. Merit Review Process**

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

- Internal University Panel
- External University Panel
- Expert Peer Review

**2. Brief Explanation**

The merit review process for research programs included individuals from within the University, external reviewers, advisory groups and USDA/NIFA personnel.

The merit review from extension programs included individuals from within the University, advisory groups and staff members.

Previous merit reviews conducted by the Advisory Council for our goat programs provided input on ways to improve these programs. These suggestions included design more programs aimed at better internal parasite control, modification of cattle barb wire fencing with electric fencing for goats and invest in developing more studies on alternative dewormers. These merit review points were incorporated into our programs.

Previous merit reviews for our aquaculture programs were conducted by an advisory group. Suggestions for improving the programs included engaging the Oklahoma Department of Wildlife Conservation regarding the sale of triploid grass carp; address angler organizations regarding the possibilities of transferring aquatic nuisance species; and suggestions on modifying project proposals and fact sheets. These merit review points were incorporated into programs.

The merit review of 4-H, Youth Development and Family & Consumer Sciences was conducted by an advisory group consisting of 4-H volunteer leaders, parents and concerned community members. Suggestions for improving our programs included tailoring 4-H activities for the needs of members based upon their financial resources and geographical location; suggestions on ways to improve the mathematics and reading curriculum of our extended education program; and suggested action plans

to enhance our programs. These merit review points were incorporated into our programs during 2013.

### **III. Stakeholder Input**

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

- Survey of traditional stakeholder individuals
- Survey of the general public

##### **Brief explanation.**

Stakeholders were contacted directly and/or through print, radio, television or the web media; and invited to participate in meetings, workshops, demonstrations and field days. Meetings were arranged to fit the stakeholder's schedule. Stakeholders were openly encouraged to share their input and appreciation was expressed for their comments.

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

##### **1. Method to identify individuals and groups**

- Use Advisory Committees
- Use External Focus Groups

##### **Brief explanation.**

Dialogue with individual stakeholders led to the identification of additional stakeholders. Stakeholders were also identified at field days, meetings, workshops, farm visits and through e-mail correspondence. When people contacted us to request information on published materials, they were identified as stakeholders and placed on our contact lists. New stakeholders were identified via these methods in 2013.

#### **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
- Other (Telephone surveys of stakeholders.)

##### **Brief explanation.**

Questions/evaluations completed by our stakeholders during field days, workshops and other sessions are very important. Stakeholders take advantage of the opportunities to help us tailor our programs and activities to fit their needs.

We know that when it comes to research, extension and education, there is no such thing as "one size fits all." Surveys are completed on-line and/or via mail. Again, they serve as another vital link between us and the needs of our stakeholders. Person-to-person contact works well for stakeholders.

Some stakeholders are on the other side of the digital divide or simply will not respond to electronic or paper questionnaires or surveys. Therefore, person-to-person contact works well for those stakeholders.

### 3. A statement of how the input will be considered

- To Identify Emerging Issues
- Redirect Extension Programs
- Redirect Research Programs

#### Brief explanation.

We take input received from our stakeholders very seriously. In the same way that a doctor asks the patient where he/she hurts, we want to know that we are poking and concentrating in the right areas. Stakeholder input has directed our efforts to such areas as anthelmintic research; modification of barbed wire with electric fencing for goat production; development of curriculum that's more user friendly; curriculum developed to address specific needs of children in nutrition, mathematics and reading; and deciding when to have certain field days and other events to accommodate our stakeholders' schedules.

#### Brief Explanation of what you learned from your Stakeholders

We learned about some of the needs of our stakeholders.

##### Examples

- (i) Youth participating in the extended program need ways to maintain and/or strengthen their mathematics and reading skills over the summer months.
- (ii) Fish producers need to diversify their production systems to increase their profits and control phytoplankton.
- (iii) Clientele need to enhance their knowledge and skills in purchasing healthy foods and preparing healthy meals.
- (iv) Meat goat producers need accurate performance measurements to project the productivity of their meat goat bucks.
- (v) There is a need for a dependable (non-chemical) method for internal parasite control in goats.
- (vi) Goat milk producers need to learn value-added techniques to help increase their profits.

We learned about some of the challenges faced by our stakeholders.

##### Examples

- (i) Internal parasite problems in goats
- (ii) Off-flavor taste of catfish from phytoplankton build-up in ponds
- (iii) Poor diets contributing to health problems
- (iv) Youth digressing over the summer months and losing many skills learned during the previous school year in mathematics and reading

IV. Expenditure Summary

<b>1. Total Actual Formula dollars Allocated (prepopulated from C-REEMS)</b>			
<b>Extension</b>		<b>Research</b>	
<b>Smith-Lever 3b &amp; 3c</b>	<b>1890 Extension</b>	<b>Hatch</b>	<b>Evans-Allen</b>
0	1784010	0	2113091

<b>2. Totaled Actual dollars from Planned Programs Inputs</b>				
<b>Extension</b>			<b>Research</b>	
	<b>Smith-Lever 3b &amp; 3c</b>	<b>1890 Extension</b>	<b>Hatch</b>	<b>Evans-Allen</b>
<b>Actual Formula</b>	0	231047	0	131024
<b>Actual Matching</b>	0	289960	0	158160
<b>Actual All Other</b>	0	1169610	0	959773
<b>Total Actual Expended</b>	0	1690617	0	1248957

<b>3. Amount of Above Actual Formula Dollars Expended which comes from Carryover funds from previous</b>				
<b>Carryover</b>	0	1169617	0	959772

## V. Planned Program Table of Content

S. No.	PROGRAM NAME
1	Enhanced Goat Production in the South-Central United States (Langston University)
2	4-H Clubs (Langston University)
3	Extended Education (Langston University)
4	Family and Consumer Sciences (Langston University)
5	Food and Nutrition (Langston University)
6	Biotechnology (Langston University)
7	Water Gardens (Aquaculture) (Langston University)
8	Alternative Species (Aquaculture) (Langston University)
9	Fishery Management (Aquaculture) (Langston University)
10	Sustainable Internal Parasite Control for Small Ruminants (Langston University)
11	Goat Internet Website (Langston University)
12	Development of New Dairy Goat Products (Langston University)
13	Demonstration Clinic: Artificial Insemination for Goats (Langston University)
14	Fish Marketing (Aquaculture) (Langston University)
15	Meat Buck Performance Test (Langston University)
16	Goat Dairy Herd Improvement (DHI) Laboratory (Langston University)
17	Phytoplankton (Aquaculture) (Langston University)

**V(A). Planned Program (Summary)**

**Program # 1**

**1. Name of the Planned Program**

Enhanced Goat Production in the South-Central United States (Langston University)

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
302	Nutrient Utilization in Animals		30%		30%
307	Animal Management Systems		30%		30%
313	Internal Parasites in Animals		20%		20%
502	New and Improved Food Products		20%		20%
	<b>Total</b>		100%		100%

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

1. Actual amount of FTE/SYs expended this Program

Year: 2013	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	2.0	0.0	3.0
Actual Paid Professional	0.0	0.4	0.0	1.4
Actual Volunteer	0.0	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
0	15832	0	54394
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	26360	0	26360
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	97418	0	163177

**V(D). Planned Program (Activity)**

**1. Brief description of the Activity**

We will publish scientific articles, present research papers at scientific meetings, write newsletters and present workshops and demonstrations.

**2. Brief description of the target audience**

All present/potential goat producers in Oklahoma and surrounding states.

**3. How was eXtension used?**

eXtension was not used in this program

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

**1. Standard output measures**

2013	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Actual</b>	160	50	350	25

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

**Patent Applications Submitted**

Year: 2013

Actual: 0

**Patents listed**

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

**Number of Peer Reviewed Publications**

2013	Extension	Research	Total
<b>Actual</b>	0	4	4

**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- Number of Research projects completed on Enhanced Goat Products

Year	Actual
2013	0





**V(G). State Defined Outcomes**

**V. State Defined Outcomes Table of Content**

O. No.	OUTCOME NAME
1	Number of goat producers learning new goat production techniques.
2	Number of goat producers using new goat production techniques.

## **Outcome #1**

### **1. Outcome Measures**

Number of goat producers learning new goat production techniques.

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

- 1890 Extension
- 1890 Research

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

Change in Condition Outcome Measure

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

<b>Year</b>	<b>Actual</b>
2013	225

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

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

Goat enterprises are important components of many farms and farming systems in the United States; particularly among small and resource-poor units. There is a growing number of farms where sales of goats or goat products provide the majority of their income. Many large operations have diversified by adding goats to more conventional production systems to benefit from the unique feeding habits of goats. Therefore, this project can lead to improvements in goat management practices, production systems, and use of goat products for increased levels and efficiencies of goat productivity and economic returns. This program is important to a large number of goat industry producers and consumers in Oklahoma, other parts of the United States and numerous countries worldwide. Goat production is very important to food security and economic security in many developing countries.

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

A number of experiments were conducted in 2013. Principal outputs of the project have been disseminated via abstracts, associated poster presentations at scientific meetings. Scientific manuscripts (4) and abstracts (4) were published. Moreover, information gained has been disseminated through the website of the American Institute for Goat Research and Extension activities such as the Annual Goat Field Day and various workshops held throughout the year.

#### **Results**

The resources employed and activities undertaken by this project are contributing to a better understanding of goat production, management and utilization of goat products. Both small and large diversified farming operations that utilize goats have been able to use the technology and information resulting from this project to increase their goat production levels, reduce losses in their herds and increase production efficiency. These changes in knowledge and improvements in production methods have helped producers increase their economic returns.

#### 4. Associated Knowledge Areas

KA Code	Knowledge Area
302	Nutrient Utilization in Animals
307	Animal Management Systems

#### Outcome #2

##### 1. Outcome Measures

Number of goat producers using new goat production techniques.

##### 2. Associated Institution Types

- 1890 Extension
- 1890 Research

##### 3a. Outcome Type:

Change in Condition Outcome Measure

##### 3b. Quantitative Outcome

Year	Actual
2013	225

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

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

Goat enterprises are important components of many farms and farming systems in the United States; particularly among small and resource-poor units. There is a growing number of farms where sales of goats or goat products provide the majority of their income. Many large operations have diversified by adding goats to more conventional production systems to benefit from the unique feeding habits of goats. Therefore, this project can lead to improvements in goat management practices, production systems, and use of goat products for increased levels and efficiencies of goat productivity and economic returns. This program is important to a large number of goat industry producers and consumers in Oklahoma, other parts of the United States and numerous countries worldwide. Goat production is very important to food security and economic security in many developing countries.

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###### **Results**

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#### 4. Associated Knowledge Areas

<b>KA Code</b>	<b>Knowledge Area</b>
302	Nutrient Utilization in Animals
307	Animal Management Systems
313	Internal Parasites in Animals
502	New and Improved Food Products

#### V(H). Planned Program (External Factors)

##### External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Other (Disease)

##### Brief Explanation

External factors did not affect outcomes.

#### V(I). Planned Program (Evaluation Studies)

##### Evaluation Results

An advisory council evaluated the scientific merit and usefulness of this project. It was deemed acceptable and on-track in its efforts.

##### Key Items of Evaluation

The project was examined for its scientific merit and to establish if it could produce useable results.

**V(A). Planned Program (Summary)**

**Program # 2**

**1. Name of the Planned Program**

4-H Clubs (Langston University)

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
806	Youth Development		100%		100%
	<b>Total</b>		100%		100%

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

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

Year: 2013	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	2.0	0.0	0.0
Actual Paid Professional	0.0	0.7	0.0	0.0
Actual Volunteer	0.0	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
0	27039	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	26360	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	121921	0	0

**V(D). Planned Program (Activity)**

**1. Brief description of the Activity**

The 4-H program will conduct meetings, training sessions, classes and use other learning vehicles to help youth develop life skills.

**2. Brief description of the target audience**

Youth in Oklahoma who qualify for the program.

**3. How was eXtension used?**

eXtension was not used in this program

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

**1. Standard output measures**

2013	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Actual</b>	195	50	481	200

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

**Patent Applications Submitted**

Year: 2013

Actual: 0

**Patents listed**

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

**Number of Peer Reviewed Publications**

2013	Extension	Research	Total
<b>Actual</b>	0	0	0

**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- Number of of Research Projects completed in the 4-H Club Program.

Year	Actual
2013	0

**V(G). State Defined Outcomes**

**V. State Defined Outcomes Table of Content**

O. No.	OUTCOME NAME
1	Number of youth learning new informations from the 4-H Club Program.
2	Number of youth using information learned in the 4-H Club program.
3	Youth who develop life skills.



## **Outcome #1**

### **1. Outcome Measures**

Number of youth learning new informations from the 4-H Club Program.

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

- 1890 Extension

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

Change in Condition Outcome Measure

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

<b>Year</b>	<b>Actual</b>
2013	100

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

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

The need for 4-H Clubs in Oklahoma counties was identified as an issue by concerned parents and community leaders. Most Oklahoma communities offer limited youth education programs for young people (especially in the areas of science, mathematics and technology). Consequently, there is an unacceptably high number of students who are more susceptible to the lure and negative effects of drugs, alcohol, teen pregnancy, peer pressure, gang violence and school drop out. Inactivity among youth has also led to another health challenge for youth in the form of obesity.

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

Langston University Cooperative Extension staff worked with 4-H volunteer leaders in order to help them maintain their volunteer certification. The staff visited each leader and provided training that included 4-H orientation, steps in starting new 4-H community clubs and serving as effective project leaders. The staff also provided information and materials to leaders in order to help them implement specific projects and events. Clubs conducted meetings during 2013 and presented tailored curriculum to youth. Club members worked on 4-H projects including gardening, woodworking, horses, goats, fabrics and fashion, computer graphics, photography, visual arts, plasticulture, entrepreneurship, money management, public speaking, science, natural resources and robotics. A Native American 4-H Club was organized in Okmulgee, Oklahoma; and 8 Native American adult volunteers were trained. Activities were also conducted to get youth to move and exercise.

#### **Results**

During 2013, over 400 youth were reached on a regular basis through Langston University 4-H Club efforts. Many, if not all, of these youth improved their skills in leadership, public speaking and proper human interaction. Youth were challenged to increase their science IQs in hopes of developing a population of future scientists and engineers. Materials were presented and

sessions conducted that will hopefully result in more youth choosing to stay away from gangs and drug involvement and become high school graduates.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
806	Youth Development

**Outcome #2**

**1. Outcome Measures**

Number of youth using information learned in the 4-H Club program.

**2. Associated Institution Types**

- 1890 Extension

**3a. Outcome Type:**

Change in Condition Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2013	0

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

**Issue (Who cares and Why)**

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**What has been done**

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**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
806	Youth Development

**Outcome #3**

**1. Outcome Measures**

Youth who develop life skills.

**2. Associated Institution Types**

- 1890 Extension

**3a. Outcome Type:**

Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Actual
2013	225

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

**Issue (Who cares and Why)**

The need for 4-H Clubs in Oklahoma counties was identified as an issue by concerned parents and community leaders. Most Oklahoma communities offer limited youth education programs for young people (especially in the areas of science, mathematics and technology). Consequently, there is an unacceptably high number of students who are more susceptible to the lure and negative effects of drugs, alcohol, teen pregnancy, peer pressure, gang violence and school drop out. Inactivity among youth has also led to another health challenge for youth in the form of obesity.

**What has been done**

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**Results**

During 2013, over 400 youth were reached on a regular basis through Langston University 4-H Club efforts. Many, if not all, of these youth improved their skills in leadership, public speaking and proper human interaction. Youth were challenged to increase their science IQs in hopes of developing a population of future scientists and engineers. Materials were presented and sessions conducted that will hopefully result in more youth choosing to stay away from gangs and drug involvement and become high school graduates.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
806	Youth Development

**V(H). Planned Program (External Factors)**

**External factors which affected outcomes**

- Appropriations changes
- Competing Public priorities

**Brief Explanation**

External factors did not affect outcomes.

**V(I). Planned Program (Evaluation Studies)**

**Evaluation Results**

Pre and post evaluations of activities showed them to be effective.

**Key Items of Evaluation**

- Build self-confidence
- Improved math skills
- Improved reading skill

**V(A). Planned Program (Summary)**

**Program # 3**

**1. Name of the Planned Program**

Extended Education (Langston University)

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
806	Youth Development		100%		100%
	<b>Total</b>		100%		100%

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

1. Actual amount of FTE/SYs expended this Program

Year: 2013	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	1.1	0.0	0.0
Actual Paid Professional	0.0	1.2	0.0	0.0
Actual Volunteer	0.0	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
0	56054	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	26360	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	121921	0	0

**V(D). Planned Program (Activity)**

1. Brief description of the Activity

Extension personnel will conduct classes and mini camps in reading, writing, math and science for youth in Oklahoma.

**2. Brief description of the target audience**

Youth in Oklahoma.

**3. How was eXtension used?**

eXtension was not used in this program

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

**1. Standard output measures**

2013	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Actual</b>	286	180	1079	800

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

**Patent Applications Submitted**

Year: 2013

Actual: 0

**Patents listed**

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

**Number of Peer Reviewed Publications**

2013	Extension	Research	Total
<b>Actual</b>	0	0	0

**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- Number of Research Projects competed on Extended Education.

Year	Actual
2013	0

**V(G). State Defined Outcomes**

**V. State Defined Outcomes Table of Content**

O. No.	OUTCOME NAME
1	Number of youth taught extended education techniques.
2	Number of youth grasping and using extended education techniques.
3	Number of youth who improved their academic performance and catch up in the classroom.

## **Outcome #1**

### **1. Outcome Measures**

Number of youth taught extended education techniques.

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

- 1890 Extension

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

Change in Condition Outcome Measure

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

<b>Year</b>	<b>Actual</b>
2013	200

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

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

The need for a summer literacy program in Logan County was identified as an issue by concerned parents and community leaders. Logan County offers limited youth education programs for young people after and during the summer months. Consequently, there is an unacceptably high number of latchkey students. Students who do not participate in skills building and recreation programs during their summer vacation are more likely to experience a diminishment in their reading and math capabilities and health and physical fitness over the summer. Students who do not have something constructive to do are more susceptible to becoming engaged in destructive situations. There is a national effort through 4-H to increase the number of youth involved in programs in science, engineering and technology (SET). We addressed that challenge in 2013 through our summer literacy program, a 4-H SET Saturday Academy and a 4-H SET Summer Camp.

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

Langston University Cooperative Extension staff planned and conducted an annual Literacy in Action Summer Reading Program designed to help Oklahoma Logan County youth (grades pre-kindergarten through fifth) learn developmental concepts that help to maintain their academic capabilities and strengthen their overall well-being. A setting was created that motivated life skill development during the months of June through July. Sixty-eight students received group and individualized instructions and hands-on practice in math, reading and writing. They participated in nutrition education workshops and performed physical fitness exercises daily. With the child obesity epidemic presently facing our country, physical fitness and proper nutrition were essential daily components of the program. We also taught a curriculum that was age-specific in science, engineering and technology (SET). This was part of a program launched during the summer and fall of 2008. The 4-H SET Curriculum was taught during the summer, on weekends and during a summer camp. College support students, volunteers and university faculty and staff helped deliver this program.



**Results**

The sixty-eight students who participated in our 4-H Literacy Program received reinforcement over the summer to help maintain or strengthen their skills in reading and mathematics. Post testing showed the success of the reading and mathematics components of this program. At the conclusion of the program 100% of youth participants demonstrated improvement in reading comprehension. One hundred percent showed improvement in understanding mathematical concepts. Instructors at a school in Logan County stated that students who participated in this summer program were more school-ready in the fall. Students who participated in the 4-H SET Summer Program received age-specific training in biotechnology, food science, computer technology, aquaculture, robotics and other areas to create within them a thirst for science, engineering and technology. Three (3) of our former 4-H SET Program students have graduated from high school and are now enrolled at universities in Oklahoma and majoring in science-related fields.

**4. Associated Knowledge Areas**

KA Code	Knowledge Area
806	Youth Development

**Outcome #2**

**1. Outcome Measures**

Number of youth grasping and using extended education techniques.

**2. Associated Institution Types**

- 1890 Extension

**3a. Outcome Type:**

Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Actual
2013	200

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

**Issue (Who cares and Why)**

The need for a summer literacy program in Logan County was identified as an issue by concerned parents and community leaders. Logan County offers limited youth education programs for young people after and during the summer months. Consequently, there is an unacceptably high number of latchkey students. Students who do not participate in skills building and recreation programs during their summer vacation are more likely to experience a diminishment in their reading and math capabilities and health and physical fitness over the summer. Students who do not have something constructive to do are more susceptible to

becoming engaged in destructive situations. There is a national effort through 4-H to increase the number of youth involved in programs in science, engineering and technology (SET). We addressed that challenge in 2013 through our summer literacy program, a 4-H SET Saturday Academy and a 4-H SET Summer Camp.

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

Langston University Cooperative Extension staff planned and conducted an annual Literacy in Action Summer Reading Program designed to help Oklahoma Logan County youth (grades pre-kindergarten through fifth) learn developmental concepts that help to maintain their academic capabilities and strengthen their overall well-being. A setting was created that motivated life skill development during the months of June through July. Sixty-eight students received group and individualized instructions and hands-on practice in math, reading and writing. They participated in nutrition education workshops and performed physical fitness exercises daily. With the child obesity epidemic presently facing our country, physical fitness and proper nutrition were essential daily components of the program. We also taught a curriculum that was age-specific in science, engineering and technology (SET). This was part of a program launched during the summer and fall of 2008. The 4-H SET Curriculum was taught during the summer, on weekends and during a summer camp. College support students, volunteers and university faculty and staff helped deliver this program.

#### **Results**

The sixty-eight students who participated in our 4-H Literacy Program received reinforcement over the summer to help maintain or strengthen their skills in reading and mathematics. Post testing showed the success of the reading and mathematics components of this program. At the conclusion of the program 100% of youth participants demonstrated improvement in reading comprehension. One hundred percent showed improvement in understanding mathematical concepts. Instructors at a school in Logan County stated that students who participated in this summer program were more school-ready in the fall. Students who participated in the 4-H SET Summer Program received age-specific training in biotechnology, food science, computer technology, aquaculture, robotics and other areas to create within them a thirst for science, engineering and technology. Three (3) of our former 4-H SET Program students have graduated from high school and are now enrolled at universities in Oklahoma and majoring in science-related fields.

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

<b>KA Code</b>	<b>Knowledge Area</b>
806	Youth Development

#### **Outcome #3**

##### **1. Outcome Measures**

Number of youth who improved their academic performance and catch up in the classroom.

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

- 1890 Extension

### 3a. Outcome Type:

Change in Condition Outcome Measure

### 3b. Quantitative Outcome

Year	Actual
2013	176

### 3c. Qualitative Outcome or Impact Statement

#### Issue (Who cares and Why)

The need for a summer literacy program in Logan County was identified as an issue by concerned parents and community leaders. Logan County offers limited youth education programs for young people after and during the summer months. Consequently, there is an unacceptably high number of latchkey students. Students who do not participate in skills building and recreation programs during their summer vacation are more likely to experience a diminishment in their reading and math capabilities and health and physical fitness over the summer. Students who do not have something constructive to do are more susceptible to becoming engaged in destructive situations. There is a national effort through 4-H to increase the number of youth involved in programs in science, engineering and technology (SET). We addressed that challenge in 2013 through our summer literacy program, a 4-H SET Saturday Academy and a 4-H SET Summer Camp.

#### What has been done

Langston University Cooperative Extension staff planned and conducted an annual Literacy in Action Summer Reading Program designed to help Oklahoma Logan County youth (grades pre-kindergarten through fifth) learn developmental concepts that help to maintain their academic capabilities and strengthen their overall well-being. A setting was created that motivated life skill development during the months of June through July. Sixty-eight students received group and individualized instructions and hands-on practice in math, reading and writing. They participated in nutrition education workshops and performed physical fitness exercises daily. With the child obesity epidemic presently facing our country, physical fitness and proper nutrition were essential daily components of the program. We also taught a curriculum that was age-specific in science, engineering and technology (SET). This was part of a program launched during the summer and fall of 2008. The 4-H SET Curriculum was taught during the summer, on weekends and during a summer camp. College support students, volunteers and university faculty and staff helped deliver this program.

#### Results

The sixty-eight students who participated in our 4-H Literacy Program received reinforcement over the summer to help maintain or strengthen their skills in reading and mathematics. Post testing showed the success of the reading and mathematics components of this program. At the conclusion of the program 100% of youth participants demonstrated improvement in reading comprehension. One hundred percent showed improvement in understanding mathematical concepts. Instructors at a school in Logan County stated that students who participated in this summer program were more school-ready in the fall. Students who participated in the 4-H SET

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#### 4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

#### V(H). Planned Program (External Factors)

##### External factors which affected outcomes

- Competing Public priorities

##### Brief Explanation

External factors did not affect outcomes.

#### V(I). Planned Program (Evaluation Studies)

##### Evaluation Results

The sixty-eight students who participated in our 4-H Literacy program received reinforcement over the summer to help maintain or strengthen their skills in reading and mathematics. Post testing showed the success of the reading and mathematics component of this program. At the conclusion of the program 100% of youth participants demonstrated improvement in reading comprehension and 100% showed improvement in understanding mathematical concepts.

##### Key Items of Evaluation

- Build self-confidence
- Improved math skills
- Improved reading skill

**V(A). Planned Program (Summary)**

**Program # 4**

**1. Name of the Planned Program**

Family and Consumer Sciences (Langston University)

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
801	Individual and Family Resource Management		100%		100%
	<b>Total</b>		100%		100%

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

1. Actual amount of FTE/SYs expended this Program

Year: 2013	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.5	0.0	0.0
Actual Paid Professional	0.0	0.5	0.0	0.0
Actual Volunteer	0.0	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
0	33281	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	26360	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	121921	0	0

**V(D). Planned Program (Activity)**

1. Brief description of the Activity

Extension personnel will conduct classes, seminars, workshops and forums to share Family and Consumer Sciences resources.

**2. Brief description of the target audience**

Primarily citizens of Oklahoma in underserved areas.

**3. How was eXtension used?**

eXtension was not used in this program

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

**1. Standard output measures**

2013	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Actual</b>	220	100	300	350

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

**Patent Applications Submitted**

Year: 2013

Actual: 0

**Patents listed**

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

**Number of Peer Reviewed Publications**

2013	Extension	Research	Total
<b>Actual</b>	0	0	0

**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- Number of Research Projects completed on Family and Consumer Sciences

Year	Actual
2013	0

**V(G). State Defined Outcomes**

**V. State Defined Outcomes Table of Content**

O. No.	OUTCOME NAME
1	Number of participants who learned about Family and Consumer Sciences.
2	Number of participants who used Family and Consumer Sciences resources.
3	Number of families that improved their quality of life at least in part from this program.

## **Outcome #1**

### **1. Outcome Measures**

Number of participants who learned about Family and Consumer Sciences.

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

- 1890 Extension

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

Change in Condition Outcome Measure

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

<b>Year</b>	<b>Actual</b>
2013	40

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

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

Public officials continue to sound the alarm about America's mounting obesity epidemic; which is no respecter of age, gender, race, or socioeconomic status. With the continued sluggishness of the economy, many Americans are facing issues in stretching food, housing and medical dollars. The Family and Consumer Sciences Program at Langston University assists clientele in combating these challenges.

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

During 2013, meetings were conducted and demonstrations carried out on healthy food selection, good nutrition and tailoring diets. Exercise type and intensity were taught during sessions. Sessions were conducted on food and nutrition principles; including food safety selection and storage; and childhood development. Targeted audiences were primarily in Logan, Oklahoma and Tulsa Counties.

#### **Results**

Program participants reported that they were more selective in their food choices; choosing more healthy foods. Some participants introduced more fruits and vegetables into their meals. These adopted changes in food choices have resulted in weight lost and put some participants on the road to healthy living at least in part because of their diets. Program participants also stated that they have experienced reductions in food costs and food borne illnesses.

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

<b>KA Code</b>	<b>Knowledge Area</b>
801	Individual and Family Resource Management



## **Outcome #2**

### **1. Outcome Measures**

Number of participants who used Family and Consumer Sciences resources.

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

- 1890 Extension

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

Change in Condition Outcome Measure

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

<b>Year</b>	<b>Actual</b>
2013	40

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

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

Public officials continue to sound the alarm about America's mounting obesity epidemic; which is no respecter of age, gender, race, or socioeconomic status. With the continued sluggishness of the economy, many Americans are facing issues in stretching food, housing and medical dollars. The Family and Consumer Sciences Program at Langston University assists clientele in combating these challenges.

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

During 2013, meetings were conducted and demonstrations carried out on healthy food selection, good nutrition and tailoring diets. Exercise type and intensity were taught during sessions. Sessions were conducted on food and nutrition principles; including food safety selection and storage; and childhood development. Targeted audiences were primarily in Logan, Oklahoma and Tulsa Counties.

#### **Results**

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

<b>KA Code</b>	<b>Knowledge Area</b>
801	Individual and Family Resource Management

**Outcome #3**

**1. Outcome Measures**

Number of families that improved their quality of life at least in part from this program.

**2. Associated Institution Types**

- 1890 Extension

**3a. Outcome Type:**

Change in Condition Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2013	40

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

**Issue (Who cares and Why)**

Public officials continue to sound the alarm about America's mounting obesity epidemic; which is no respecter of age, gender, race, or socioeconomic status. With the continued sluggishness of the economy, many Americans are facing issues in stretching food, housing and medical dollars. The Family and Consumer Sciences Program at Langston University assists clientele in combating these challenges.

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During 2013, meetings were conducted and demonstrations carried out on healthy food selection, good nutrition and tailoring diets. Exercise type and intensity were taught during sessions. Sessions were conducted on food and nutrition principles; including food safety selection and storage; and childhood development. Targeted audiences were primarily in Logan, Oklahoma and Tulsa Counties.

**Results**

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**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
801	Individual and Family Resource Management

### **V(H). Planned Program (External Factors)**

#### **External factors which affected outcomes**

- Competing Public priorities

#### **Brief Explanation**

External factors did not affect outcomes.

### **V(I). Planned Program (Evaluation Studies)**

#### **Evaluation Results**

Evaluation revealed positive changes in food selection, preparation and storage. Improved money management resulted in more efficient use of food dollars.

#### **Key Items of Evaluation**

- Improved food selection
- Improved food preparation and storage skills.

**V(A). Planned Program (Summary)**

**Program # 5**

**1. Name of the Planned Program**

Food and Nutrition (Langston University)

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
504	Home and Commercial Food Service		100%		100%
	<b>Total</b>		100%		100%

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

1. Actual amount of FTE/SYs expended this Program

Year: 2013	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	1.0	0.0	0.0
Actual Paid Professional	0.0	0.5	0.0	0.0
Actual Volunteer	0.0	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
0	31001	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	26360	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	121921	0	0

**V(D). Planned Program (Activity)**

1. Brief description of the Activity

Extension personnel will conduct classes, seminars, workshops and hold community forums to teach healthy food and nutrition concepts.

**2. Brief description of the target audience**

Primarily limited resource families, youth and the elderly.

**3. How was eXtension used?**

eXtension was not used in this program

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

**1. Standard output measures**

2013	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Actual</b>	60	40	26	20

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

**Patent Applications Submitted**

Year: 2013

Actual: 0

**Patents listed**

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

**Number of Peer Reviewed Publications**

2013	Extension	Research	Total
<b>Actual</b>	0	0	0

**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- Number of Research Projects competed on Food and Nutrition.

Year	Actual
2013	0

**V(G). State Defined Outcomes**

**V. State Defined Outcomes Table of Content**

O. No.	OUTCOME NAME
1	Number of participants who learned about food and nutrition.
2	Number of participants who used knowledge/guidelines presented during food and nutrition sessions.
3	Number of participants who improve their lifestyles by following food and nutrition guidelines.

**Outcome #1**

**1. Outcome Measures**

Number of participants who learned about food and nutrition.

**2. Associated Institution Types**

- 1890 Extension

**3a. Outcome Type:**

Change in Condition Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2013	0

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

**Issue (Who cares and Why)**

Food and nutrition practices play a key role in the health of a nation. Many common diseases or conditions leading to diseases such as diabetes, hypertension and heart disease are linked to poor food and nutrition choices. This is especially true within the minority population. Oklahoma, and especially rural Oklahoma, ranks high among the states when it comes to overweight and obesity.

**What has been done**

During 2013, food and nutrition sessions and workshops were conducted at public and private schools, community centers and agencies. Pre-and post-tests were given to participants. Hands-on activities challenged participants to learn by doing. Educational exhibits were displayed at USDA sites, public schools, universities and other sites.

**Results**

During 2013, program participants made positive nutritional changes in their eating habits. New approaches resulting in healthier eating regimens were taken.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
504	Home and Commercial Food Service

**Outcome #2**

**1. Outcome Measures**

Number of participants who used knowledge/guidelines presented during food and nutrition sessions.

**2. Associated Institution Types**

- 1890 Extension

**3a. Outcome Type:**

Change in Condition Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2013	25

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

**Issue (Who cares and Why)**

Food and nutrition practices play a key role in the health of a nation. Many common diseases or conditions leading to diseases such as diabetes, hypertension and heart disease are linked to poor food and nutrition choices. This is especially true within the minority population. Oklahoma, and especially rural Oklahoma, ranks high among the states when it comes to overweight and obesity.

**What has been done**

During 2013, food and nutrition sessions and workshops were conducted at public and private schools, community centers and agencies. Pre-and post-tests were given to participants. Hands-on activities challenged participants to learn by doing. Educational exhibits were displayed at USDA sites, public schools, universities and other sites.

**Results**

During 2013, program participants made positive nutritional changes in their eating habits. New approaches resulting in healthier eating regiments were taken.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
504	Home and Commercial Food Service



**Outcome #3**

**1. Outcome Measures**

Number of participants who improve their lifestyles by following food and nutrition guidelines.

**2. Associated Institution Types**

- 1890 Extension

**3a. Outcome Type:**

Change in Condition Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2013	25

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

**Issue (Who cares and Why)**

Food and nutrition practices play a key role in the health of a nation. Many common diseases or conditions leading to diseases such as diabetes, hypertension and heart disease are linked to poor food and nutrition choices. This is especially true within the minority population. Oklahoma, and especially rural Oklahoma, ranks high among the states when it comes to overweight and obesity.

**What has been done**

During 2013, food and nutrition sessions and workshops were conducted at public and private schools, community centers and agencies. Pre-and post-tests were given to participants. Hands-on activities challenged participants to learn by doing. Educational exhibits were displayed at USDA sites, public schools, universities and other sites.

**Results**

During 2013, program participants made positive nutritional changes in their eating habits. New approaches resulting in healthier eating regimens were taken.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
504	Home and Commercial Food Service

### **V(H). Planned Program (External Factors)**

#### **External factors which affected outcomes**

- Government Regulations
- Competing Public priorities

#### **Brief Explanation**

External factors did not affect outcomes.

### **V(I). Planned Program (Evaluation Studies)**

#### **Evaluation Results**

Participants indicated that they are making better decisions and choices related food, nutrition, budgeting and balanced diets.

#### **Key Items of Evaluation**

- Improvement in food selection, preparation and storage skills
- Development of better budgeting skills

**V(A). Planned Program (Summary)****Program # 6****1. Name of the Planned Program**

Biotechnology (Langston University)

 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
201	Plant Genome, Genetics, and Genetic Mechanisms		100%		100%
	<b>Total</b>		100%		100%

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

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

Year: 2013	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.2	0.0	1.0
Actual Paid Professional	0.0	0.2	0.0	1.0
Actual Volunteer	0.0	0.2	0.0	1.1

## 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	1896	0	41050
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	26360	0	26360
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	97418	0	153019

**V(D). Planned Program (Activity)**

## 1. Brief description of the Activity

Researchers will develop a local peanut nucleotide database and build a bioinformatics pipeline for peanut gene discovery.

**2. Brief description of the target audience**

All peanut producers in Oklahoma

**3. How was eXtension used?**

eXtension was not used in this program

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

**1. Standard output measures**

2013	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Actual</b>	100	50	50	50

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

**Patent Applications Submitted**

Year: 2013

Actual: 0

**Patents listed**

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

**Number of Peer Reviewed Publications**

2013	Extension	Research	Total
<b>Actual</b>	0	1	1

**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- Number of Research Projects completed on Biotechnology.

Year	Actual
2013	0

**V(G). State Defined Outcomes**

**V. State Defined Outcomes Table of Content**

O. No.	OUTCOME NAME
1	Number of farmers learning about the peanut nucleotide database.
2	Number of farmers using the peanut nucleotide database.
3	Farmers who use the peanut nucleotide database or new peanut gene discoveries to improve their peanut production system.

## **Outcome #1**

### **1. Outcome Measures**

Number of farmers learning about the peanut nucelotide database.

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

- 1890 Extension
- 1890 Research

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

Change in Condition Outcome Measure

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

<b>Year</b>	<b>Actual</b>
2013	12

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

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

There is a need for developing improved peanut genotypes that are higher yielding and more disease and insect resistant. Improved nutritional varieties would include higher protein levels by alleviation of plant DNA that causes allergens. The peanut is relatively easily accessible and a less-expensive source of vegetable protein. Its improvement will significantly help in the global war against hunger and poverty. The pace for developing these improved genotypes will be accelerated through the use of modern techniques such as those used in the Biotechnology Program at Langston University.

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

During 2013, biotechnology studies were conducted on the peanut. Gene sequencing progressing and analysis were carried out. The program also provided research experience and mentorship to 12 Langston University undergraduate students. One peer-reviewed article was published.

#### **Results**

A number of potential impacts resulted from the 2013 Langston University Biotechnology Program's activities. Those impacts will be seen as we determine genetic differences between peanut groups. Activities this year also resulted in 12 undergraduates enhancing their hands-on lab skills. Those students benefited from biotechnology outreach activities. They enhanced their research knowledge, skills, critical thinking and scientific communication skills.

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

<b>KA Code</b>	<b>Knowledge Area</b>
201	Plant Genome, Genetics, and Genetic Mechanisms

**Outcome #2**

**1. Outcome Measures**

Number of farmers using the peanut nucleotide database.

**2. Associated Institution Types**

- 1890 Extension
- 1890 Research

**3a. Outcome Type:**

Change in Condition Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2013	10

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

**Issue (Who cares and Why)**

There is a need for developing improved peanut genotypes that are higher yielding and more disease and insect resistant. Improved nutritional varieties would include higher protein levels by alleviation of plant DNA that causes allergens. The peanut is relatively easily accessible and a less-expensive source of vegetable protein. Its improvement will significantly help in the global war against hunger and poverty. The pace for developing these improved genotypes will be accelerated through the use of modern techniques such as those used in the Biotechnology Program at Langston University.

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**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
201	Plant Genome, Genetics, and Genetic Mechanisms

### **Outcome #3**

#### **1. Outcome Measures**

Farmers who use the peanut nucleotide database or new peanut gene discoveries to improve their peanut production system.

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

- 1890 Extension
- 1890 Research

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

Change in Condition Outcome Measure

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

<b>Year</b>	<b>Actual</b>
2013	0

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

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

There is a need for developing improved peanut genotypes that are higher yielding and more disease and insect resistant. Improved nutritional varieties would include higher protein levels by alleviation of plant DNA that causes allergens. The peanut is relatively easily accessible and a less-expensive source of vegetable protein. Its improvement will significantly help in the global war against hunger and poverty. The pace for developing these improved genotypes will be accelerated through the use of modern techniques such as those used in the Biotechnology Program at Langston University.

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

During 2013, biotechnology studies were conducted on the peanut. Gene sequencing progressing and analysis were carried out. The program also provided research experience and mentorship to 12 Langston University undergraduate students. One peer-reviewed article was published.

##### **Results**

A number of potential impacts resulted from the 2013 Langston University Biotechnology Program's activities. Those impacts will be seen as we determine genetic differences between peanut groups. Activities this year also resulted in 12 undergraduates enhancing their hands-on lab skills. Those students benefited from biotechnology outreach activities. They enhanced their research knowledge, skills, critical thinking and scientific communication skills.

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

<b>KA Code</b>	<b>Knowledge Area</b>
201	Plant Genome, Genetics, and Genetic Mechanisms



### **V(H). Planned Program (External Factors)**

#### **External factors which affected outcomes**

- Competing Public priorities

#### **Brief Explanation**

- Time series (multiple points before and after program).

### **V(I). Planned Program (Evaluation Studies)**

#### **Evaluation Results**

Annual progress with mapping pathways and developing DNA libraries for improving test species.

#### **Key Items of Evaluation**

- Developing DNA libraries.

**V(A). Planned Program (Summary)**

**Program # 7**

**1. Name of the Planned Program**

Water Gardens (Aquaculture) (Langston University)

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
401	Structures, Facilities, and General Purpose Farm Supplies		100%		100%
	<b>Total</b>		100%		100%

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

1. Actual amount of FTE/SYs expended this Program

Year: 2013	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.2	0.0	0.3
Actual Paid Professional	0.0	1.0	0.0	0.6
Actual Volunteer	0.0	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
0	32351	0	11107
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	26360	0	26360
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	97418	0	154046

**V(D). Planned Program (Activity)**

1. Brief description of the Activity

Studies were conducted on water garden filtration utilizing native submergent aquatic vegetation and on biological filter design for koi ponds.

**2. Brief description of the target audience**

All aquaculture farmers in Oklahoma.

**3. How was eXtension used?**

eXtension was not used in this program

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

**1. Standard output measures**

2013	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Actual</b>	200	100	50	100

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

**Patent Applications Submitted**

Year: 2013

Actual: 0

**Patents listed**

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

**Number of Peer Reviewed Publications**

2013	Extension	Research	Total
<b>Actual</b>	0	0	0

**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- Number of Research Projects completed on Water Gardens

Year	Actual
2013	0

**V(G). State Defined Outcomes**

**V. State Defined Outcomes Table of Content**

O. No.	OUTCOME NAME
1	Number of farmers learning water garden techniques.
2	Number of farmers using water garden techniques.
3	Farmers who improve the water quality of their water gardens and reduce operational costs.

**Outcome #1**

**1. Outcome Measures**

Number of farmers learning water garden techniques.

**2. Associated Institution Types**

- 1890 Extension
- 1890 Research

**3a. Outcome Type:**

Change in Condition Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2013	20

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

**Issue (Who cares and Why)**

Filtration systems for ornamental ponds are derived from technologies developed for municipal waste treatment and/or swimming pools. While treatment cost is secondary for municipalities, both capital and operating costs are primary concerns for owners of private ornamental ponds. Costs can be reduced by using systems that rely on low pressure, high volume pumps. The cost reduction can be enhanced by combining technologies to maximize performance for solids removal and biotransformation of organic waste materials.

**What has been done**

During 2013, we conducted the Annual Langston University Aquaculture Day and participated in the meeting of the Kansas Aquaculture Association. Presentations were made during those conferences regarding the opportunities for aquaculture production and sales in Oklahoma and surrounding states. Filter systems for ornamental ponds were also designed.

**Results**

Potential impacts of the newly designed filter systems will be reductions in the capital invested and operating costs for producers.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
401	Structures, Facilities, and General Purpose Farm Supplies

**Outcome #2**

**1. Outcome Measures**

Number of farmers using water garden techniques.

**2. Associated Institution Types**

- 1890 Extension
- 1890 Research

**3a. Outcome Type:**

Change in Condition Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2013	300

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

**Issue (Who cares and Why)**

Filtration systems for ornamental ponds are derived from technologies developed for municipal waste treatment and/or swimming pools. While treatment cost is secondary for municipalities, both capital and operating costs are primary concerns for owners of private ornamental ponds. Costs can be reduced by using systems that rely on low pressure, high volume pumps. The cost reduction can be enhanced by combining technologies to maximize performance for solids removal and biotransformation of organic waste materials.

**What has been done**

During 2013, we conducted the Annual Langston University Aquaculture Day and participated in the meeting of the Kansas Aquaculture Association. Presentations were made during those conferences regarding the opportunities for aquaculture production and sales in Oklahoma and surrounding states. Filter systems for ornamental ponds were also designed.

**Results**

Potential impacts of the newly designed filter systems will be reductions in the capital invested and operating costs for producers.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
401	Structures, Facilities, and General Purpose Farm Supplies

### **Outcome #3**

#### **1. Outcome Measures**

Farmers who improve the water quality of their water gardens and reduce operational costs.

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

- 1890 Extension
- 1890 Research

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

Change in Condition Outcome Measure

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

<b>Year</b>	<b>Actual</b>
2013	30

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

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

Filtration systems for ornamental ponds are derived from technologies developed for municipal waste treatment and/or swimming pools. While treatment cost is secondary for municipalities, both capital and operating costs are primary concerns for owners of private ornamental ponds. Costs can be reduced by using systems that rely on low pressure, high volume pumps. The cost reduction can be enhanced by combining technologies to maximize performance for solids removal and biotransformation of organic waste materials.

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

During 2013, we conducted the Annual Langston University Aquaculture Day and participated in the meeting of the Kansas Aquaculture Association. Presentations were made during those conferences regarding the opportunities for aquaculture production and sales in Oklahoma and surrounding states. Filter systems for ornamental ponds were also designed.

##### **Results**

Potential impacts of the newly designed filter systems will be reductions in the capital invested and operating costs for producers.

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

<b>KA Code</b>	<b>Knowledge Area</b>
401	Structures, Facilities, and General Purpose Farm Supplies

**V(H). Planned Program (External Factors)**

**External factors which affected outcomes**

- Natural Disasters (drought, weather extremes, etc.)

**Brief Explanation**

External factors did not affect outcomes.

**V(I). Planned Program (Evaluation Studies)**

**Evaluation Results**

Development of best management practices for the water garden industry.

**Key Items of Evaluation**

Sharing best management practices with clientele.



**V(A). Planned Program (Summary)**

**Program # 8**

**1. Name of the Planned Program**

Alternative Species (Aquaculture) (Langston University)

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
307	Animal Management Systems		100%		100%
	<b>Total</b>		100%		100%

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

1. Actual amount of FTE/SYs expended this Program

Year: 2013	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.4	0.0	0.2
Actual Paid Professional	0.0	0.0	0.0	0.0
Actual Volunteer	0.0	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
0	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	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

Buffalo fish species will be tested for sustainability and profitabiliy in Oklahoma.

**2. Brief description of the target audience**

All aquaculture farmers in Oklahoma.

**3. How was eXtension used?**

eXtension was not used in this program

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

**1. Standard output measures**

2013	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	0	0	0	0

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

**Patent Applications Submitted**

Year: 2013

Actual: 0

**Patents listed**

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

**Number of Peer Reviewed Publications**

2013	Extension	Research	Total
Actual	0	0	0

**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- Number of Research Projects completed on Alternative Species

Year	Actual
2013	0

**V(G). State Defined Outcomes**

**V. State Defined Outcomes Table of Content**

O. No.	OUTCOME NAME
1	Number of farmers learning alternative fish species techniques.
2	Number of farmers using alternative fish species techniques.
3	Farmers who improved their yearly income by using alternative fish species.

### **Outcome #1**

#### **1. Outcome Measures**

Number of farmers learning alternative fish species techniques.

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

- 1890 Extension
- 1890 Research

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

Change in Condition Outcome Measure

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

<b>Year</b>	<b>Actual</b>
2013	0

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

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

No activity occurred during 2013.

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

No activity occurred during 2013.

##### **Results**

No activity occurred during 2013.

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

<b>KA Code</b>	<b>Knowledge Area</b>
307	Animal Management Systems

### **Outcome #2**

#### **1. Outcome Measures**

Number of farmers using alternative fish species techniques.

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

- 1890 Extension
- 1890 Research

**3a. Outcome Type:**

Change in Condition Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2013	0

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

**Issue (Who cares and Why)**

No activity occurred during 2013.

**What has been done**

No activity occurred during 2013.

**Results**

No activity occurred during 2013.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
307	Animal Management Systems

**Outcome #3**

**1. Outcome Measures**

Farmers who improved their yearly income by using alternative fish species.

**2. Associated Institution Types**

- 1890 Extension
- 1890 Research

**3a. Outcome Type:**

Change in Condition Outcome Measure

### 3b. Quantitative Outcome

Year	Actual
2013	0

### 3c. Qualitative Outcome or Impact Statement

#### Issue (Who cares and Why)

No activity occurred during 2013.

#### What has been done

No activity occurred during 2013.

#### Results

No activity occurred during 2013.

### 4. Associated Knowledge Areas

KA Code	Knowledge Area
307	Animal Management Systems

### V(H). Planned Program (External Factors)

#### External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)

#### Brief Explanation

No activity occurred during 2013.

### V(I). Planned Program (Evaluation Studies)

#### Evaluation Results

No activity occurred during 2013.

#### Key Items of Evaluation

No activity occurred during 2013.

**V(A). Planned Program (Summary)**

**Program # 9**

**1. Name of the Planned Program**

Fishery Management (Aquaculture) (Langston University)

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
307	Animal Management Systems		100%		100%
	<b>Total</b>		100%		100%

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

1. Actual amount of FTE/SYs expended this Program

Year: 2013	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.4	0.0	0.3
Actual Paid Professional	0.0	0.0	0.0	0.0
Actual Volunteer	0.0	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
0	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	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

Work will be performed in fishery management under such conditions as drought, aquatic vegetation infestation and pond leaks.

**2. Brief description of the target audience**

All aquaculture farmers in Oklahoma.

**3. How was eXtension used?**

eXtension was not used in this program

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

**1. Standard output measures**

2013	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	0	0	0	0

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

**Patent Applications Submitted**

Year: 2013

Actual: 0

**Patents listed**

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

**Number of Peer Reviewed Publications**

2013	Extension	Research	Total
Actual	0	0	0

**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- Number of Research Projects completed on Fishery Management.

Year	Actual
2013	0



**V(G). State Defined Outcomes**

**V. State Defined Outcomes Table of Content**

O. No.	OUTCOME NAME
1	Number of farmers learning new fishery management techniques.
2	Number of farmers using new fishery management techniques.
3	Farmers who have improved their production efficiency and raised their profits with the new fishery management techniques.

**Outcome #1**

**1. Outcome Measures**

Number of farmers learning new fishery management techniques.

**2. Associated Institution Types**

- 1890 Extension

**3a. Outcome Type:**

Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Actual
2013	0

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

**Issue (Who cares and Why)**

No activity occurred during 2013.

**What has been done**

No activity occurred during 2013.

**Results**

No activity occurred during 2013.

**4. Associated Knowledge Areas**

KA Code	Knowledge Area
307	Animal Management Systems

**Outcome #2**

**1. Outcome Measures**

Number of farmers using new fishery management techniques.

**2. Associated Institution Types**

- 1890 Extension

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

Year	Actual
2013	0

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

**Issue (Who cares and Why)**

No activity occurred during 2013.

**What has been done**

No activity occurred during 2013.

**Results**

No activity occurred during 2013.

**4. Associated Knowledge Areas**

KA Code	Knowledge Area
307	Animal Management Systems

**Outcome #3**

**1. Outcome Measures**

Farmers who have improved their production efficiency and raised their profits with the new fishery management techniques.

**2. Associated Institution Types**

- 1890 Extension

**3a. Outcome Type:**

Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Actual
------	--------

2013                      0

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

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

No activity occurred during 2013.

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

No activity occurred during 2013.

#### **Results**

No activity occurred during 2013.

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

<b>KA Code</b>	<b>Knowledge Area</b>
307	Animal Management Systems

### **V(H). Planned Program (External Factors)**

#### **External factors which affected outcomes**

- Natural Disasters (drought, weather extremes, etc.)

#### **Brief Explanation**

External factors did not affect outcomes.

### **V(I). Planned Program (Evaluation Studies)**

#### **Evaluation Results**

Overall improvement in urban pond water quality at specific sites and consequently improvement in the quality of some watershed streams.

#### **Key Items of Evaluation**

- Increase in water quality for specific residential ponds.

**V(A). Planned Program (Summary)**

**Program # 10**

**1. Name of the Planned Program**

Sustainable Internal Parasite Control for Small Ruminants (Langston University)

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
313	Internal Parasites in Animals		100%		100%
	<b>Total</b>		100%		100%

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

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

Year: 2013	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.2	0.0	0.1
Actual Paid Professional	0.0	0.3	0.0	0.1
Actual Volunteer	0.0	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
0	16588	0	381
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	26360	0	26360
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	97418	0	163177

**V(D). Planned Program (Activity)**

**1. Brief description of the Activity**

Internal parasites are the most important health issue in small ruminants; causing greater morbidity, mortality and lost production than the next three most important diseases. The problems with internal parasites include lack of knowledge on biology and management practices to control them, internet

misinformation and dewormer resistance.

**2. Brief description of the target audience**

The target audience is primarily small ruminant producers.

**3. How was eXtension used?**

eXtension was not used in this program

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

**1. Standard output measures**

2013	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Actual</b>	415	500	34	20

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

**Patent Applications Submitted**

Year: 2013

Actual: 0

**Patents listed**

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

**Number of Peer Reviewed Publications**

2013	Extension	Research	Total
<b>Actual</b>	0	0	0

**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- Number of Research Projects completed on sustainable internal parasite control.

Year	Actual
2013	0

**V(G). State Defined Outcomes**

**V. State Defined Outcomes Table of Content**

O. No.	OUTCOME NAME
1	Number of goat producers learning internal parasite control techniques.
2	Number of goat producers using internal parasite control techniques.
3	Goat producers who have gotten internal parasites under control by using the learned control technique.

## **Outcome #1**

### **1. Outcome Measures**

Number of goat producers learning internal parasite control techniques.

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

- 1890 Extension
- 1890 Research

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

Change in Condition Outcome Measure

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

<b>Year</b>	<b>Actual</b>
2013	206

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

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

Internal parasites (Gastrointestinal Nematodes) are the most important health issue in sheep and goats; causing greater morbidity, mortality and lost production than the next three most important diseases. The problems with internal parasites include lack of knowledge on biology and management practices to control them, internet misinformation and dewormer resistance. All goat producers in this region of the country have internal parasite challenges with their herds and significant to severe dewormer resistance. Therefore, both goat and sheep producers are interested in practices to better control internal parasites in their animals.

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

During 2013, four (4) workshops were conducted on internal parasite control in small ruminants. Workshops emphasized the use of FAMACHA for determining when animals needed to be dewormed; and management practices to reduce worm infections in sheep and goats.

#### **Results**

Based upon surveys received from producers who participated in our 2013 workshops, twenty of twenty-two producers used the non-chemical deworming practices taught during our workshops (91%). Fifteen out of the twenty-two producers experienced a reduction in the number of required dewormings (68%). Thirteen producers (59%) indicated a cost saving of \$75 to \$400 by reducing the number of herd dewormings. Also, seven producers (32%) reported a reduction in animal losses that was a saving of \$300-\$2,500.

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

<b>KA Code</b>	<b>Knowledge Area</b>
313	Internal Parasites in Animals



**Outcome #2**

**1. Outcome Measures**

Number of goat producers using internal parasite control techniques.

**2. Associated Institution Types**

- 1890 Extension
- 1890 Research

**3a. Outcome Type:**

Change in Condition Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2013	156

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

**Issue (Who cares and Why)**

Internal parasites (Gastrointestinal Nematodes) are the most important health issue in sheep and goats; causing greater morbidity, mortality and lost production than the next three most important diseases. The problems with internal parasites include lack of knowledge on biology and management practices to control them, internet misinformation and dewormer resistance. All goat producers in this region of the country have internal parasite challenges with their herds and significant to severe dewormer resistance. Therefore, both goat and sheep producers are interested in practices to better control internal parasites in their animals.

**What has been done**

During 2013, four (4) workshops were conducted on internal parasite control in small ruminants. Workshops emphasized the use of FAMACHA for determining when animals needed to be dewormed; and management practices to reduce worm infections in sheep and goats.

**Results**

Based upon surveys received from producers who participated in our 2013 workshops, twenty of twenty-two producers used the non-chemical deworming practices taught during our workshops (91%). Fifteen out of the twenty-two producers experienced a reduction in the number of required dewormings (68%). Thirteen producers (59%) indicated a cost saving of \$75 to \$400 by reducing the number of herd dewormings. Also, seven producers (32%) reported a reduction in animal losses that was a saving of \$300-\$2,500.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
313	Internal Parasites in Animals

### **Outcome #3**

#### **1. Outcome Measures**

Goat producers who have gotten internal parasites under control by using the learned control technique.

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

- 1890 Extension
- 1890 Research

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

Change in Condition Outcome Measure

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

<b>Year</b>	<b>Actual</b>
2013	100

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

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

Internal parasites (Gastrointestinal Nematodes) are the most important health issue in sheep and goats; causing greater morbidity, mortality and lost production than the next three most important diseases. The problems with internal parasites include lack of knowledge on biology and management practices to control them, internet misinformation and dewormer resistance. All goat producers in this region of the country have internal parasite challenges with their herds and significant to severe dewormer resistance. Therefore, both goat and sheep producers are interested in practices to better control internal parasites in their animals.

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

During 2013, four (4) workshops were conducted on internal parasite control in small ruminants. Workshops emphasized the use of FAMACHA for determining when animals needed to be dewormed; and management practices to reduce worm infections in sheep and goats.

##### **Results**

Based upon surveys received from producers who participated in our 2013 workshops, twenty of twenty-two producers used the non-chemical deworming practices taught during our workshops (91%). Fifteen out of the twenty-two producers experienced a reduction in the number of required dewormings (68%). Thirteen producers (59%) indicated a cost saving of \$75 to \$400 by reducing the number of herd dewormings. Also, seven producers (32%) reported a reduction in animal losses that was a saving of \$300-\$2,500.

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

<b>KA Code</b>	<b>Knowledge Area</b>
313	Internal Parasites in Animals

**V(H). Planned Program (External Factors)**

**External factors which affected outcomes**

- Natural Disasters (drought, weather extremes, etc.)

**Brief Explanation**

Drought

**V(I). Planned Program (Evaluation Studies)**

**Evaluation Results**

Eagerness of goat producers to adopt alternative parasite control methods.

**Key Items of Evaluation**

Goat producers adopt practices and experience improvements in their herds' health.

**V(A). Planned Program (Summary)**

**Program # 11**

**1. Name of the Planned Program**

Goat Internet Website (Langston University)

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
903	Communication, Education, and Information Delivery		100%		100%
	<b>Total</b>		100%		100%

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

1. Actual amount of FTE/SYs expended this Program

Year: 2013	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.1	0.0	0.1
Actual Paid Professional	0.0	0.2	0.0	0.1
Actual Volunteer	0.0	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
0	5504	0	1176
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	26360	0	26360
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	97418	0	163177

**V(D). Planned Program (Activity)**

1. Brief description of the Activity

Meat goat production is one of the fastest growing sectors of the livestock industry in the United States. New producers, as well as some established ones, have an expressed need for current, correct

information on how to raise goats and produce safe, wholesome products in demand by the public. As the meat goat industry grows and evolves, a quality assurance (QA) program is essential. Such a QA program ensures the production of a wholesome product that satisfies consumers and increases profits for the meat goat industry.

**2. Brief description of the target audience**

The target audience is primarily goat producers interested in becoming certified in meat goat production.

**3. How was eXtension used?**

eXtension was not used in this program

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

**1. Standard output measures**

2013	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Actual</b>	50619	40000	500	200

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

**Patent Applications Submitted**

Year: 2013  
 Actual: 0

**Patents listed**

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

**Number of Peer Reviewed Publications**

2013	Extension	Research	Total
<b>Actual</b>	0	0	0

**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- Number of Research Projects completed on Goat Internet Website.

**Year Actual**

2013

0

**V(G). State Defined Outcomes**

**V. State Defined Outcomes Table of Content**

O. No.	OUTCOME NAME
1	Number of goat producers learning about information found on the goat internet website.
2	Number of goat producers using the goat internet website.
3	Goat producers who improved their operations with information from the goat internet website.

## **Outcome #1**

### **1. Outcome Measures**

Number of goat producers learning about information found on the goat internet website.

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

- 1890 Extension
- 1890 Research

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

Change in Knowledge Outcome Measure

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

<b>Year</b>	<b>Actual</b>
2013	24

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

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

Meat goat production is one of the fastest growing sectors of the livestock industry in the United States. New producers, as well as some established ones, have an expressed need for current, correct information on how to raise goats and produce safe, wholesome products in demand by the public. As the meat goat industry grows and evolves, a quality assurance (QA) program is essential. Such a QA program ensures the production of a wholesome product that satisfies consumers and increases profit for the meat goat industry.

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

Langston University was awarded funding by the Food Safety and Inspection Service of USDA to develop training and certification for meat goat producers. Langston University organized and led a consortium of 1890 universities and producer associations in this project. The consortium identified the subject topics most pertinent and pressing for the instructional modules. The consortium then identified experts on the selected subject topics and pursued these experts as module authors. These authors represent the most qualified persons in their field in academia as well as in the industry. Langston University translated the 22 instructional modules into web pages with accompanying images, and pre- and post tests for those producers wishing to pursue certification. This program is known as the Quality Producer (QP) online certification. All modules are also available in pdf for easy printing and the introductory module is available as a podchapter for downloading and listening on your favorite mp3 player. The web-site (<http://www2.luresext.edu/goats/training/qa.html>) was well received by the goat community. In 2013, to better understand internet user's preferences, a tracking code for Goggle Analytics was again embedded in each web page.



**Results**

Two thousand two hundred (2,200) goat producers have enrolled in the on-line certification program and 285 goat producers have been certified via the site to date. Knowledge gained by producers for more efficient and effective goat production can potentially result in increased profits for many of these 285 producers. Based upon Goggle Analytics data, there were 69,576 visits to the online site in 2013 and visitors spent an average of 3 minutes and 11 seconds per visit. These visits represented 187 countries or territories, all 50 states and the District of Columbia.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
903	Communication, Education, and Information Delivery

**Outcome #2**

**1. Outcome Measures**

Number of goat producers using the goat internet website.

**2. Associated Institution Types**

- 1890 Extension
- 1890 Research

**3a. Outcome Type:**

Change in Condition Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2013	0

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

**Issue (Who cares and Why)**

Meat goat production is one of the fastest growing sectors of the livestock industry in the United States. New producers, as well as some established ones, have an expressed need for current, correct information on how to raise goats and produce safe, wholesome products in demand by the public. As the meat goat industry grows and evolves, a quality assurance (QA) program is essential. Such a QA program ensures the production of a wholesome product that satisfies consumers and increases profit for the meat goat industry.

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### 4. Associated Knowledge Areas

KA Code	Knowledge Area
903	Communication, Education, and Information Delivery

### Outcome #3

#### 1. Outcome Measures

Goat producers who improved their operations with information from the goat internet website.

#### 2. Associated Institution Types

- 1890 Extension
- 1890 Research

#### 3a. Outcome Type:

Change in Condition Outcome Measure

#### 3b. Quantitative Outcome

Year	Actual
2013	24

### 3c. Qualitative Outcome or Impact Statement

#### Issue (Who cares and Why)

Meat goat production is one of the fastest growing sectors of the livestock industry in the United States. New producers, as well as some established ones, have an expressed need for current, correct information on how to raise goats and produce safe, wholesome products in demand by the public. As the meat goat industry grows and evolves, a quality assurance (QA) program is essential. Such a QA program ensures the production of a wholesome product that satisfies consumers and increases profit for the meat goat industry.

#### What has been done

Langston University was awarded funding by the Food Safety and Inspection Service of USDA to develop training and certification for meat goat producers. Langston University organized and led a consortium of 1890 universities and producer associations in this project. The consortium identified the subject topics most pertinent and pressing for the instructional modules. The consortium then identified experts on the selected subject topics and pursued these experts as module authors. These authors represent the most qualified persons in their field in academia as well as in the industry. Langston University translated the 22 instructional modules into web pages with accompanying images, and pre- and post tests for those producers wishing to pursue certification. This program is known as the Quality Producer (QP) online certification. All modules are also available in pdf for easy printing and the introductory module is available as a podchapter for downloading and listening on your favorite mp3 player. The web-site (<http://www2.luresext.edu/goats/training/qa.html>) was well received by the goat community. In 2013, to better understand internet user's preferences, a tracking code for Goggle Analytics was again embedded in each web page.

#### Results

Two thousand two hundred (2,200) goat producers have enrolled in the on-line certification program and 285 goat producers have been certified via the site to date. Knowledge gained by producers for more efficient and effective goat production can potentially result in increased profits for many of these 285 producers. Based upon Goggle Analytics data, there were 69,576 visits to the online site in 2013 and visitors spent an average of 3 minutes and 11 seconds per visit. These visits represented 187 countries or territories, all 50 states and the District of Columbia.

### 4. Associated Knowledge Areas

KA Code	Knowledge Area
903	Communication, Education, and Information Delivery

### V(H). Planned Program (External Factors)

#### External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)

#### Brief Explanation

External factors did not affect outcomes.

### **V(I). Planned Program (Evaluation Studies)**

#### **Evaluation Results**

Eagerness of goat producers to register for and complete the goat producer certification module.

#### **Key Items of Evaluation**

Certified goat producers who improved their goat production practices.

**V(A). Planned Program (Summary)**

**Program # 12**

**1. Name of the Planned Program**

Development of New Dairy Goat Products (Langston University)

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
502	New and Improved Food Products		100%		100%
	<b>Total</b>		100%		100%

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

1. Actual amount of FTE/SYs expended this Program

Year: 2013	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.3	0.0	0.3
Actual Paid Professional	0.0	0.0	0.0	0.0
Actual Volunteer	0.0	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
0	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	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

No activity to report this year.

**2. Brief description of the target audience**

All goat producers in Oklahoma.

**3. How was eXtension used?**

eXtension was not used in this program

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

**1. Standard output measures**

2013	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	0	0	0	0

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

**Patent Applications Submitted**

Year: 2013

Actual: 0

**Patents listed**

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

**Number of Peer Reviewed Publications**

2013	Extension	Research	Total
Actual	0	0	0

**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- Number of Research projects completed on Development of New Dairy Goat Products

<b>Year</b>	<b>Actual</b>
2013	0

**V(G). State Defined Outcomes**

**V. State Defined Outcomes Table of Content**

O. No.	OUTCOME NAME
1	Number of goat producers learning about techniques for developing new dairy goat products.
2	Number of goat producers using techniques for developing new dairy goat products.
3	Goat producers developing increasing yearly income from new dairy goat products.

**Outcome #1**

**1. Outcome Measures**

Number of goat producers learning about techniques for developing new dairy goat products.

**2. Associated Institution Types**

- 1890 Extension

**3a. Outcome Type:**

Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Actual
2013	0

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

**Issue (Who cares and Why)**

No activity occurred during 2013.

**What has been done**

No activity occurred during 2013.

**Results**

No activity occurred during 2013.

**4. Associated Knowledge Areas**

KA Code	Knowledge Area
502	New and Improved Food Products

**Outcome #2**

**1. Outcome Measures**

Number of goat producers using techniques for developing new dairy goat products.

**2. Associated Institution Types**



- 1890 Extension

**3a. Outcome Type:**

Change in Condition Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2013	0

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

**Issue (Who cares and Why)**

No activity occurred during 2013.

**What has been done**

No activity occurred during 2013.

**Results**

No activity occurred during 2013.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
502	New and Improved Food Products

**Outcome #3**

**1. Outcome Measures**

Goat producers developing increasing yearly income from new dairy goat products.

**2. Associated Institution Types**

- 1890 Extension

**3a. Outcome Type:**

Change in Condition Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
-------------	---------------

2013                      0

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

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

No activity occurred during 2013.

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

No activity occurred during 2013.

#### **Results**

No activity occurred during 2013.

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

<b>KA Code</b>	<b>Knowledge Area</b>
502	New and Improved Food Products

### **V(H). Planned Program (External Factors)**

#### **External factors which affected outcomes**

- Natural Disasters (drought, weather extremes, etc.)

#### **Brief Explanation**

No activity occurred during 2013.

### **V(I). Planned Program (Evaluation Studies)**

#### **Evaluation Results**

No activity occurred during 2013.

#### **Key Items of Evaluation**

No activity occurred during 2013.

**V(A). Planned Program (Summary)**

**Program # 13**

**1. Name of the Planned Program**

Demonstration Clinic: Artificial Insemination for Goats (Langston University)

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
301	Reproductive Performance of Animals		100%		100%
	<b>Total</b>		100%		100%

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

1. Actual amount of FTE/SYs expended this Program

Year: 2013	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.1	0.0	0.0
Actual Paid Professional	0.0	0.1	0.0	0.0
Actual Volunteer	0.0	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
0	3624	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	26360	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	97418	0	0

**V(D). Planned Program (Activity)**

1. Brief description of the Activity

Hands-on artificial insemination (AI) workshops will be conducted to teach AI techniques to goat producers. These AI skills will allow goat producers to gain access to genetically superior sires for herd improvement.

**2. Brief description of the target audience**

All goat producers in Oklahoma.

**3. How was eXtension used?**

eXtension was not used in this program

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

**1. Standard output measures**

2013	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Actual</b>	47	100	6	20

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

**Patent Applications Submitted**

Year: 2013

Actual: 0

**Patents listed**

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

**Number of Peer Reviewed Publications**

2013	Extension	Research	Total
<b>Actual</b>	0	4	4

**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- Number of Research projects completed on Demonstration Clinic: Artificial Insemination for Goats

Year	Actual
2013	0

**V(G). State Defined Outcomes**

**V. State Defined Outcomes Table of Content**

O. No.	OUTCOME NAME
1	Number of goat producers learning about artificial insemination techniques.
2	Number of goat producers using artificial insemination techniques.
3	Goat producers who improved their herds by using artificial insemination techniques.

## **Outcome #1**

### **1. Outcome Measures**

Number of goat producers learning about artificial insemination techniques.

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

- 1890 Extension
- 1890 Research

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

Change in Action Outcome Measure

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

<b>Year</b>	<b>Actual</b>
2013	47

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

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

The use of superior sires is imperative for improving the genetic composition of breeding stock. Artificial insemination (AI) has long been used in the dairy cattle industry and is a simple technology that goat producers can acquire. However, opportunities for goat producers to acquire the necessary skills via formal and practical instruction are not widespread. Langston University has instituted a practical workshop for instruction in artificial insemination in goats. Producers are instructed in the anatomy and physiology of the female goat, estrus detection and handling and storage of semen. Producers participate in a hands-on insemination exercise. An understanding of the anatomy and physiology enable the producer to devise seasonal breeding plans and to troubleshoot problem breeders. Acquiring goat artificial insemination skills also allows producers to save money by conducting the inseminations themselves, rather than hiring an inseminator.

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

In 2013, AI workshops were held on 09/07/13 and 10/12/13 on the Langston University campus (Langston Oklahoma); and on 10/05/13 at Kansas State University. Forty seven (47) participants enrolled and received AI training.

#### **Results**

Three workshops were conducted in AI for goats. Goat producers are under-served in this area because traditional AI courses are geared toward cattle and the AI techniques differ drastically between the species. Goat producers participating in the workshops saved money by being able to conduct their own herd artificial inseminations. They can also potentially improve their herds with access to genetic material from superior sires.

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

**KA Code**    **Knowledge Area**  
301            Reproductive Performance of Animals

**Outcome #2**

**1. Outcome Measures**

Number of goat producers using artificial insemination techniques.

**2. Associated Institution Types**

- 1890 Extension
- 1890 Research

**3a. Outcome Type:**

Change in Condition Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2013	21

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

**Issue (Who cares and Why)**

The use of superior sires is imperative for improving the genetic composition of breeding stock. Artificial insemination (AI) has long been used in the dairy cattle industry and is a simple technology that goat producers can acquire. However, opportunities for goat producers to acquire the necessary skills via formal and practical instruction are not widespread. Langston University has instituted a practical workshop for instruction in artificial insemination in goats. Producers are instructed in the anatomy and physiology of the female goat, estrus detection and handling and storage of semen. Producers participate in a hands-on insemination exercise. An understanding of the anatomy and physiology enable the producer to devise seasonal breeding plans and to troubleshoot problem breeders. Acquiring goat artificial insemination skills also allows producers to save money by conducting the inseminations themselves, rather than hiring an inseminator.

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Three workshops were conducted in AI for goats. Goat producers are under-served in this area because traditional AI courses are geared toward cattle and the AI techniques differ drastically between the species. Goat producers participating in the workshops saved money by being able to conduct their own herd artificial inseminations. They can also potentially improve their herds

with access to genetic material from superior sires.

#### 4. Associated Knowledge Areas

KA Code	Knowledge Area
301	Reproductive Performance of Animals

#### Outcome #3

##### 1. Outcome Measures

Goat producers who improved their herds by using artificial insemination techniques.

##### 2. Associated Institution Types

- 1890 Extension
- 1890 Research

##### 3a. Outcome Type:

Change in Condition Outcome Measure

##### 3b. Quantitative Outcome

Year	Actual
2013	21

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

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

The use of superior sires is imperative for improving the genetic composition of breeding stock. Artificial insemination (AI) has long been used in the dairy cattle industry and is a simple technology that goat producers can acquire. However, opportunities for goat producers to acquire the necessary skills via formal and practical instruction are not widespread. Langston University has instituted a practical workshop for instruction in artificial insemination in goats. Producers are instructed in the anatomy and physiology of the female goat, estrus detection and handling and storage of semen. Producers participate in a hands-on insemination exercise. An understanding of the anatomy and physiology enable the producer to devise seasonal breeding plans and to troubleshoot problem breeders. Acquiring goat artificial insemination skills also allows producers to save money by conducting the inseminations themselves, rather than hiring an inseminator.

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###### **Results**



Three workshops were conducted in AI for goats. Goat producers are under-served in this area because traditional AI courses are geared toward cattle and the AI techniques differ drastically between the species. Goat producers participating in the workshops saved money by being able to conduct their own herd artificial inseminations. They can also potentially improve their herds with access to genetic material from superior sires.

#### 4. Associated Knowledge Areas

KA Code	Knowledge Area
301	Reproductive Performance of Animals

#### V(H). Planned Program (External Factors)

##### External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)

##### Brief Explanation

External factors did not affect outcomes

#### V(I). Planned Program (Evaluation Studies)

##### Evaluation Results

Goat producers acquiring artificial insemination skills

##### Key Items of Evaluation

- Goat producers saving money by performing artificial insemination on their own herds.
- Goat producers improving their herds via genetic material from superior sires.

**V(A). Planned Program (Summary)**

**Program # 14**

**1. Name of the Planned Program**

Fish Marketing (Aquaculture) (Langston University)

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
601	Economics of Agricultural Production and Farm Management		100%		100%
	<b>Total</b>		100%		100%

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

1. Actual amount of FTE/SYs expended this Program

Year: 2013	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.4	0.0	0.2
Actual Paid Professional	0.0	0.0	0.0	0.0
Actual Volunteer	0.0	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
0	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	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

Methods of marketing alternative fish species will be explored to increase fish producers' profits.

**2. Brief description of the target audience**

All aquaculture producers in Oklahoma.

**3. How was eXtension used?**

eXtension was not used in this program

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

**1. Standard output measures**

2013	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	0	0	0	0

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

**Patent Applications Submitted**

Year: 2013

Actual: 0

**Patents listed**

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

**Number of Peer Reviewed Publications**

2013	Extension	Research	Total
Actual	0	0	0

**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- Number of Research Projects completed on Fish Marketing.

Year	Actual
2013	0

**V(G). State Defined Outcomes**

**V. State Defined Outcomes Table of Content**

O. No.	OUTCOME NAME
1	Number of farmers learning new fish marketing techniques.
2	Number of farmers using new fish marketing techniques.
3	Farmers who use new fish marketing techniques to increase their profits.

## **Outcome #1**

### **1. Outcome Measures**

Number of farmers learning new fish marketing techniques.

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

- 1890 Extension
- 1890 Research

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

Change in Condition Outcome Measure

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

<b>Year</b>	<b>Actual</b>
2013	0

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

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

Aquaculture producers need additional sale venues to withstand economic uncertainties. Competition from a state agency is an ongoing obstacle to sales. Aquaculture production of buffalo fishes and grass carp can meet consumer desires and provide additional income opportunities for channel catfish producers, but more buyers must be found for buffalo and grass carp.

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

Due to the severe drought, no activity occurred in 2013.

#### **Results**

Due to the severe drought, no activity occurred in 2013.

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

<b>KA Code</b>	<b>Knowledge Area</b>
601	Economics of Agricultural Production and Farm Management

## **Outcome #2**

### **1. Outcome Measures**

Number of farmers using new fish marketing techniques.

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

- 1890 Extension
- 1890 Research

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

Change in Action Outcome Measure

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

<b>Year</b>	<b>Actual</b>
2013	0

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

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

Aquaculture producers need additional sale venues to withstand economic uncertainties. Competition from a state agency is an ongoing obstacle to sales. Aquaculture production of buffalo fishes and grass carp can meet consumer desires and provide additional income opportunities for channel catfish producers, but more buyers must be found for buffalo and grass carp.

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

Due to the severe drought, no activity occurred in 2013.

#### **Results**

Due to the severe drought, no activity occurred in 2013.

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

<b>KA Code</b>	<b>Knowledge Area</b>
601	Economics of Agricultural Production and Farm Management

### **Outcome #3**

#### **1. Outcome Measures**

Farmers who use new fish marketing techniques to increase their profits.

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

- 1890 Extension
- 1890 Research

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

Change in Knowledge Outcome Measure

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

<b>Year</b>	<b>Actual</b>
2013	0

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

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

Aquaculture producers need additional sale venues to withstand economic uncertainties. Competition from a state agency is an ongoing obstacle to sales. Aquaculture production of buffalo fishes and grass carp can meet consumer desires and provide additional income opportunities for channel catfish producers, but more buyers must be found for buffalo and grass carp.

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

Due to the severe drought, no activity occurred in 2013

##### **Results**

Due to the severe drought, no activity occurred in 2013.

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

<b>KA Code</b>	<b>Knowledge Area</b>
601	Economics of Agricultural Production and Farm Management

#### **V(H). Planned Program (External Factors)**

##### **External factors which affected outcomes**

- Natural Disasters (drought, weather extremes, etc.)

**Brief Explanation**

External factors did not affect outcomes.

**V(I). Planned Program (Evaluation Studies)**

**Evaluation Results**

Development of new markets or marketing methods for fish producers.

**Key Items of Evaluation**

- Fish producers improving their income via direct marketing of fish.



**V(A). Planned Program (Summary)**

**Program # 15**

**1. Name of the Planned Program**

Meat Buck Performance Test (Langston University)

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
303	Genetic Improvement of Animals		100%		100%
	<b>Total</b>		100%		100%

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

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

Year: 2013	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.2	0.0	0.1
Actual Paid Professional	0.0	0.0	0.0	0.0
Actual Volunteer	0.0	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
0	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	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**

Extension personnel will conduct the annual meat goat performance test for young, growing meat bucks to evaluate growth and feed efficiency.

**2. Brief description of the target audience**

All goat producers in Oklahoma

**3. How was eXtension used?**

eXtension was not used in this program

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

**1. Standard output measures**

2013	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	0	0	0	0

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

**Patent Applications Submitted**

Year: 2013

Actual: 0

**Patents listed**

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

**Number of Peer Reviewed Publications**

2013	Extension	Research	Total
Actual	0	0	0

**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- Number of Research Projects completed on Meat Buck Performance Test.

Year	Actual
2013	0

**V(G). State Defined Outcomes**

**V. State Defined Outcomes Table of Content**

O. No.	OUTCOME NAME
1	Number of goat producers learning about the meat buck performance test.
2	Number of goat producers using the meat goat performance test.
3	Goat producers who improve their herds via the meat buck performance test.

**Outcome #1**

**1. Outcome Measures**

Number of goat producers learning about the meat buck performance test.

**2. Associated Institution Types**

- 1890 Extension

**3a. Outcome Type:**

Change in Condition Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2013	0

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

**Issue (Who cares and Why)**

An influential aspect of meat goat production is the growth rate and/or efficiency of kids. Objective performance records are needed when making informed genetic selections to improve average daily gain, feed efficiency and/or residual feed intake. In order to compare animals from different ranches or environments, a central performance meat buck testing is conducted. In 1997, Langston University established a meat buck performance test to promote the identification and increased utilization of genetically superior sires.

**What has been done**

No activity occurred in 2013

**Results**

No activity occurred in 2013.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
303	Genetic Improvement of Animals

**Outcome #2**

**1. Outcome Measures**

Number of goat producers using the meat goat performance test.

**2. Associated Institution Types**

- 1890 Extension

**3a. Outcome Type:**

Change in Condition Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2013	0

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

**Issue (Who cares and Why)**

An influential aspect of meat goat production is the growth rate and/or efficiency of kids. Objective performance records are needed when making informed genetic selections to improve average daily gain, feed efficiency and/or residual feed intake. In order to compare animals from different ranches or environments, a central performance meat buck testing is conducted. In 1997, Langston University established a meat buck performance test to promote the identification and increased utilization of genetically superior sires.

**What has been done**

No activity occurred in 2013.

**Results**

No activity occurred in 2013.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
303	Genetic Improvement of Animals

**Outcome #3**

**1. Outcome Measures**

Goat producers who improve their herds via the meat buck performance test.

**2. Associated Institution Types**

- 1890 Extension

**3a. Outcome Type:**

Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Actual
2013	0

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

**Issue (Who cares and Why)**

An influential aspect of meat goat production is the growth rate and/or efficiency of kids. Objective performance records are needed when making informed genetic selections to improve average daily gain, feed efficiency and/or residual feed intake. In order to compare animals from different ranches or environments, a central performance meat buck testing is conducted. In 1997, Langston University established a meat buck performance test to promote the identification and increased utilization of genetically superior sires.

**What has been done**

No activity occurred in 2013.

**Results**

No activity occurred in 2013.

**4. Associated Knowledge Areas**

KA Code	Knowledge Area
303	Genetic Improvement of Animals

**V(H). Planned Program (External Factors)**

**External factors which affected outcomes**

- Natural Disasters (drought, weather extremes, etc.)

**Brief Explanation**

External factors did not affect outcomes.

**V(I). Planned Program (Evaluation Studies)**

**Evaluation Results**

Meat buck performance tests give goat producers an accurate assessment of the market value of their animals.

**Key Items of Evaluation**

- Some meat goat producers are able to demand higher market values for their animals because of an accurate buck performance test.

**V(A). Planned Program (Summary)**

**Program # 16**

**1. Name of the Planned Program**

Goat Dairy Herd Improvement (DHI) Laboratory (Langston University)

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
308	Improved Animal Products (Before Harvest)		100%		100%
	<b>Total</b>		100%		100%

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

1. Actual amount of FTE/SYs expended this Program

Year: 2013	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.1	0.0	1.0
Actual Paid Professional	0.0	0.2	0.0	1.0
Actual Volunteer	0.0	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
0	7877	0	22916
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	26360	0	26360
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	97418	0	163177

**V(D). Planned Program (Activity)**

1. Brief description of the Activity

Extension personnel will conduct goat milk quality tests in the Langston University Goat Dairy Herd Improvement Laboratory.



**2. Brief description of the target audience**

All goat producers in Oklahoma.

**3. How was eXtension used?**

eXtension was not used in this program

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

**1. Standard output measures**

2013	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Actual</b>	210	100	750	200

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

**Patent Applications Submitted**

Year: 2013

Actual: 0

**Patents listed**

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

**Number of Peer Reviewed Publications**

2013	Extension	Research	Total
<b>Actual</b>	0	1	1

**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- Number of Research Projects completed on Goat Dairy Herd Improvement (DHI) Laboratory.

Year	Actual
2013	0

**V(G). State Defined Outcomes**

**V. State Defined Outcomes Table of Content**

O. No.	OUTCOME NAME
1	Number of goat producers who learned about the Goat Dairy Herd Improvement Laboratory.
2	Number of goat producers who are using the Goat Dairy Herd Improvement Laboratory.
3	Goat producers who have increased their production profits by utilizing the Goat Dairy Herd Improvement Laboratory.

## **Outcome #1**

### **1. Outcome Measures**

Number of goat producers who learned about the Goat Dairy Herd Improvement Laboratory.

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

- 1890 Extension
- 1890 Research

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

Change in Condition Outcome Measure

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

<b>Year</b>	<b>Actual</b>
2013	75

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

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

Dairy Herd Improvement Association (DHIA) has been serving cow producers for decades. However, for many years dairy goat producers had to deal with records written in cow language. This meant that they could not get accurate information in goat terms and that all the reports reflected cows, bulls and calves rather than does, bucks and kids. The records produced by our DHI lab are used to identify high producing does. These records are useful for the exportation of these does to foreign countries and accurate data could enhance the resale value of their does and offspring for the producers domestically as well. DHI programs are playing a significant role in increasing goat milk production and quality. Langston University operates a certified laboratory that operates under the supervision of the National Dairy Herd Improvement Association.

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

During 2013, we used a program developed in cooperation with other institutions to utilize goat language for accurate data measurements and recordings. Accurate records were produced on dairy goat breeds along with correct gender identification and expected delivery dates for pregnant does. Workshops were conducted on the benefits of having DHIA records and how to collect raw data and milk samples for DHI laboratory processing. New programs were incorporated to enhance laboratory operation efficiency.

#### **Results**

Goat producers are now able to get records for their animals that reflect accurate information with the correct language. These records not only reflect higher fat and protein values for a doe, but also are easier to understand when used for genetic evaluation and for herd management. Currently, we are serving 170 goat producers in 35 states. Information provided by the Langston University DHI Laboratory has allowed goat producers to demand higher prices for their animals during sales. Of the 170 participating producers, information from this program may have helped

them increase their profits.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
308	Improved Animal Products (Before Harvest)

**Outcome #2**

**1. Outcome Measures**

Number of goat producers who are using the Goat Dairy Herd Improvement Laboratory.

**2. Associated Institution Types**

- 1890 Extension
- 1890 Research

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2013	700

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

**Issue (Who cares and Why)**

Dairy Herd Improvement Association (DHIA) has been serving cow producers for decades. However, for many years dairy goat producers had to deal with records written in cow language. This meant that they could not get accurate information in goat terms and that all the reports reflected cows, bulls and calves rather than does, bucks and kids. The records produced by our DHI lab are used to identify high producing does. These records are useful for the exportation of these does to foreign countries and accurate data could enhance the resale value of their does and offspring for the producers domestically as well. DHI programs are playing a significant role in increasing goat milk production and quality. Langston University operates a certified laboratory that operates under the supervision of the National Dairy Herd Improvement Association.

**What has been done**

During 2013, we used a program developed in cooperation with other institutions to utilize goat language for accurate data measurements and recordings. Accurate records were produced on dairy goat breeds along with correct gender identification and expected delivery dates for pregnant does. Workshops were conducted on the benefits of having DHIA records and how to collect raw data and milk samples for DHI laboratory processing. New programs were incorporated to enhance laboratory operation efficiency.

**Results**

Goat producers are now able to get records for their animals that reflect accurate information with the correct language. These records not only reflect higher fat and protein values for a doe, but also are easier to understand when used for genetic evaluation and for herd management.

Currently, we are serving 170 goat producers in 35 states. Information provided by the Langston University DHI Laboratory has allowed goat producers to demand higher prices for their animals during sales. Of the 170 participating producers, information from this program may have helped them increase their profits.

**4. Associated Knowledge Areas**

KA Code	Knowledge Area
308	Improved Animal Products (Before Harvest)

**Outcome #3**

**1. Outcome Measures**

Goat producers who have increased their production profits by utilizing the Goat Dairy Herd Improvement Laboratory.

**2. Associated Institution Types**

- 1890 Extension
- 1890 Research

**3a. Outcome Type:**

Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Actual
2013	75

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

**Issue (Who cares and Why)**

Dairy Herd Improvement Association (DHIA) has been serving cow producers for decades. However, for many years dairy goat producers had to deal with records written in cow language. This meant that they could not get accurate information in goat terms and that all the reports reflected cows, bulls and calves rather than does, bucks and kids. The records produced by our DHI lab are used to identify high producing does. These records are useful for the exportation of these does to foreign countries and accurate data could enhance the resale value of their does and offspring for the producers domestically as well. DHI programs are playing a significant role in increasing goat milk production and quality. Langston University operates a certified laboratory that operates under the supervision of the National Dairy Herd Improvement Association.

**What has been done**

During 2013, we used a program developed in cooperation with other institutions to utilize goat language for accurate data measurements and recordings. Accurate records were produced on dairy goat breeds along with correct gender identification and expected delivery dates for pregnant does. Workshops were conducted on the benefits of having DHIA records and how to collect raw data and milk samples for DHI laboratory processing. New programs were incorporated to enhance laboratory operation efficiency.

#### **Results**

Goat producers are now able to get records for their animals that reflect accurate information with the correct language. These records not only reflect higher fat and protein values for a doe, but also are easier to understand when used for genetic evaluation and for herd management.

Currently, we are serving 170 goat producers in 35 states. Information provided by the Langston University DHI Laboratory has allowed goat producers to demand higher prices for their animals during sales. Of the 170 participating producers, information from this program may have helped them increase their profits.

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

<b>KA Code</b>	<b>Knowledge Area</b>
308	Improved Animal Products (Before Harvest)

#### **V(H). Planned Program (External Factors)**

##### **External factors which affected outcomes**

- Natural Disasters (drought, weather extremes, etc.)

##### **Brief Explanation**

External factors did not affect outcomes.

#### **V(I). Planned Program (Evaluation Studies)**

##### **Evaluation Results**

Goat producers are able to get accurate milk fat and protein records for their dairy goats.

##### **Key Items of Evaluation**

- Goat producers are able to get accurate milk fat and protein values to use in marketing their does and improving their herds.

**V(A). Planned Program (Summary)**

**Program # 17**

**1. Name of the Planned Program**

Phytoplankton (Aquaculture) (Langston University)

- Reporting on this Program
  - Reason for not reporting
  - Program has been completed.

**V(B). Program Knowledge Area(s)**

- 1. Program Knowledge Areas and Percentage

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

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

Year: 2013	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.4	0.0	0.4
Actual Paid Professional	0.0	0.0	0.0	0.0
Actual Volunteer	0.0	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
{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}
<b>1862 Matching</b>	<b>1890 Matching</b>	<b>1862 Matching</b>	<b>1890 Matching</b>
{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}
<b>1862 All Other</b>	<b>1890 All Other</b>	<b>1862 All Other</b>	<b>1890 All Other</b>
{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}

**V(D). Planned Program (Activity)**

**1. Brief description of the Activity**

Water analysis and phytoplankton management practices will be tested to determine feasible methods of phytoplankton management for small scale fish farmers.

**2. Brief description of the target audience**

All aquaculture farmers in Oklahoma.

**3. How was eXtension used?**

{No Data Entered}

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

**1. Standard output measures**

2013	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	0	0	0	0

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

**Patent Applications Submitted**

Year: 2013

Actual: 0

**Patents listed**

{No Data Entered}

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

**Number of Peer Reviewed Publications**

2013	Extension	Research	Total
Actual	1	0	0

**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- Number of Research Projects completed on Phytoplankton

Year	Actual
2013	0



**V(G). State Defined Outcomes**

**V. State Defined Outcomes Table of Content**

O. No.	OUTCOME NAME
1	Number of farmers learning phytoplankton management techniques.
2	Number of farmers using phytoplankton management techniques.
3	Farmers who adopted phytoplankton management techniques to contain or eradicate their phytoplankton problems.

**Outcome #1**

**1. Outcome Measures**

Number of farmers learning phytoplankton management techniques.

**2. Associated Institution Types**

- 1890 Extension
- 1890 Research

**3a. Outcome Type:**

Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Actual
2013	0

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

**Issue (Who cares and Why)**  
{No Data Entered}

**What has been done**  
{No Data Entered}

**Results**  
{No Data Entered}

**4. Associated Knowledge Areas**

KA Code	Knowledge Area
{No Data}	null

**Outcome #2**

**1. Outcome Measures**

Number of farmers using phytoplankton management techniques.

**2. Associated Institution Types**

- 1890 Extension
- 1890 Research

**3a. Outcome Type:**

Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Actual
2013	0

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

**Issue (Who cares and Why)**  
{No Data Entered}

**What has been done**  
{No Data Entered}

**Results**  
{No Data Entered}

**4. Associated Knowledge Areas**

KA Code	Knowledge Area
{No Data}	null

**Outcome #3**

**1. Outcome Measures**

Farmers who adopted phytoplankton management techniques to contain or eradicate their phytoplankton problems.

**2. Associated Institution Types**

- 1890 Extension
- 1890 Research

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

### 3b. Quantitative Outcome

Year	Actual
2013	0

### 3c. Qualitative Outcome or Impact Statement

#### Issue (Who cares and Why)

{No Data Entered}

#### What has been done

{No Data Entered}

#### Results

{No Data Entered}

### 4. Associated Knowledge Areas

KA Code	Knowledge Area
{No Data}	null

### V(H). Planned Program (External Factors)

#### External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)

#### Brief Explanation

{No Data Entered}

### V(I). Planned Program (Evaluation Studies)

#### Evaluation Results

{No Data Entered}

#### Key Items of Evaluation

{No Data Entered}