

# 2014 University of Kentucky and Kentucky State University Combined Research and Extension Annual Report of Accomplishments and Results

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## I. Report Overview

### 1. Executive Summary

This report includes many of the projects and programs that have been generated by the Research and Extension efforts of the Kentucky Cooperative Extension system, the Kentucky State University Agricultural Research Station and the Kentucky Agricultural Experiment Station at the University of Kentucky. Moreover, the document contains information that reveals the collaborative efforts of county and state level personnel working together to enhance the lives of Kentuckians.

Some of our 2014 accomplishments include: Educational 4-H programs that relate to Robotics programs aimed at extending its reach in science, engineering and technology (4-H SET) by providing opportunities for hands-on scientific learning and discovery in club settings; the beef cattle IRM working group addressed key Kentucky Beef IRM is to increase the profitability of beef operations in Kentucky by using intense educational programming that will result in producers' adopting proven money-making practices. A Water quality task force investigated issues on the importance of conserving and protecting waterways on the farm and around the home. ; Transitioning the family farm from one generation to the next is a key topic; the Management in Tough Times initiative produced numerous materials and again hosted the "It's Your Reality" event geared towards teaching students the realities of making a living; High impact educational programs such as Master Gardener, Master Grazer, and Master Marketer resulted in significant improvements in consumer horticulture, animal nutrition, farm income, natural resources utilization. Promoting effective parenting skills among fathers has gained recognition as a critical program emphasis, resulting in an annual statewide conference.

In 2014, we continued our routine follow up to assess our issues discovery process, which served as a facilitation tool for county Plan of Work discussions. This included leaders and agents talking about what is needed at the county level. The issues discovery process is a dialogue made possible by our presence in all 120 counties. Throughout the year, agents and volunteer leaders came together to discuss the progress of how programs were addressing the needs of local communities. The data remains useful in assessing and maintaining programs that address pertinent issues. Several programs are being evaluated for impact and may be utilized in the new plan of work cycle beginning in 2016.

With the emphasis on accountability, we also continue to make strides in highlighting specific programs that are addressing traditional and non-traditional needs through public value materials. To date, a significant number of print materials have been created and now being showcased on the UK Extension homepage. Videos are now in the process of being developed to highlight these programs.

Agricultural research through Kentucky's land grant programs has been providing new opportunities to farmers and residents for more than 130 years. With external grants and contracts now reaching over \$30 million a year, agriculture researchers address problems of agribusiness, consumers, international trade, food processing, nutrition, community development, soil and water resources, and the environment with over 300 externally funded projects. The research continuum reaches from basic to applied science, with new fundamental knowledge as well as applied knowledge that has impacts on the lives of Kentuckians and people across the world.

As a result of interaction with volunteers, council members and other stakeholders, the 2014 program year emphasis as defined by the number of contacts, is as follows:

31% Global Food Security and Hunger

6% Social and Economic Opportunity

- 25% Life Skill Development
- 3% Childhood Obesity
- 13% Leadership and Volunteerism
- 2% Food Safety
- 13% Diet, Nutrition and Healthy Lifestyles
- 1% Sustainable energy
- 5% Agricultural and Environmental Quality
- 1% Climate Change

Joint activities between the University of Kentucky and Kentucky State University remains an expectation of faculty and staff. Faculty and specialist continue to collaborate on many projects, thus allowing the institutions to operate as a single entity. Agents and program assistants are both located in county offices, sharing not only office space but also budget, supervision and facility management responsibilities. This strong bond has resulted in shared program efforts, many of which are reported in this document. Efforts continue to include programming and research in such areas as:

- |                     |                                    |                                |
|---------------------|------------------------------------|--------------------------------|
| Grapes and Wine     | Environmental Education for Youth  | Youth Entrepreneurship         |
| Goats               | eXtension                          | Small Business Development     |
| Cattle Production   | Tobacco Sector Farming Adjustments | Business Retention & Expansion |
| Pawpaws             | U.S. Animal Identification Program | Family Financial Management    |
| Small Farm Programs | Organic Ag and Vegetable Programs  | E-commerce                     |
| Aquaculture         | AgrAbility                         | Health & wellness              |
| Sustainable Ag      | Limited Resource Families          | Home Horticulture              |
| Youth Dev.          | Entrepreneurial Coaching Institute | Childhood Obesity              |

Kentucky State University and the University of Kentucky share adjunct faculty with at least three positions in entomology, three positions in horticulture, three positions in animal sciences, and one position in agricultural economics.

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

Year: 2014	Extension		Research	
	1862	1890	1862	1890
Plan	470.0	43.0	75.0	41.0
Actual	519.0	56.3	198.8	42.9

**II. Merit Review Process**

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

- Internal University Panel
- External University Panel
- External Non-University Panel
- Combined External and Internal University Panel
- Combined External and Internal University External Non-University Panel
- Expert Peer Review
- Other (State Extension Advisory Committee )

## **2. Brief Explanation**

Kentucky Cooperative Extension continues to define merit review as a process used to judge the degree to which a planned program (1) is relevant to needs expressed by stakeholder groups, (2) draws upon current research and knowledge, (3) is congruent with quality standards and best practice, and (4) is likely to produce anticipated outcomes. Merit review for research is similar in that it uses the criteria of (1) consideration for potential impact, (2) relevance to the needs of stakeholders, and (3) appropriateness within the mission and priorities of the experiment station, USDA, and the land grant mission.

The Plan of Work has been built on program goals that the Cooperative Extension Service identified through Extension advisory committees, developed through logic model program committees and reviewed through program area committees made up of Extension assistant directors, extension agents, department chairs, and specialists. The program area assistant directors select, refine and replace featured programs based on identified needs in the greatest number of counties, current and planned research and educational resources, and the ability to effectively deal with the issues. Over 40 non-university individuals who comprise the State Extension Council representing both the University of Kentucky and Kentucky State University, all geographic regions of Kentucky as well as agriculture, youth, families, business, industry, and public education served as reviewers of the Plan of Work using the criteria identified above.

The University of Kentucky Agricultural Experiment Station focuses on scientific peer review and merit review on individual research projects. Scientific review is evaluation by other researchers who possess the expertise to conduct the same or similar research. Such review includes technical feasibility, originality and scientific/disciplinary significance of the research. Project proposals go through an initial anonymous peer review. If satisfactory expertise is not available within the department or on campus, external reviews are solicited. After multiple reviews (usually three) a project committee recommends approval, rejection or revision. Only approved projects move forward for review at the college level. The college review committee conducts further scientific peer review by highly qualified individuals as well as a designated statistician and other appropriate faculty. Outside expertise, including researchers around the nation and stakeholder review, are also used.

Kentucky State University requires all project-based proposals to be peer-reviewed based on scientific merit and relevance to state, national and regional USDA priorities and the KSU mission. All Evans -Allen supported proposals are first sent for external peer-review by at least two scientists outside KSU to ensure the relevance and quality of the science. University of Kentucky faculty are often included on the proposal review panels in addition to peer reviews via, regional, national, and professional association colleagues.

## **III. Stakeholder Input**

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

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

- Survey of selected individuals from the general public
- Other (Training stakeholders in expectations relative to program needs)

**Brief explanation.**

The Kentucky Extension Advisory Council System has served as a primary mechanism for gaining input into program direction and development. For programs to meet the needs of the audiences they intend to serve, county level councils are to be diverse enough to represent the various constituencies within the counties including underserved and underrepresented audiences. Their purpose on the council is to express their own needs as well as to gain additional resident perspectives through traditional and non-traditional means in order to provide input into development of local extension programs. These representatives of the various audiences are not only involved in planning but also implementation and evaluation of those programs. In addition to a county extension council, each county also has an agricultural advisory council, homemaker's council, home economics advisory council, and 4-H council. They communicate research and resource needs to the universities. Through an Issues gathering process, topics of greatest importance are brought forward through district and state meetings attended by program leaders, extension agents and district directors. The issues identified are then presented to state program leaders, extension specialists, and department chairs for response.

Each county also has a district board that manages the fiscal affairs of the Extension office. The board is comprised of citizens in the county that represent the various program areas, plus the county judge executive.

As full partners, the Cooperative Extension Service and Kentucky Agricultural Experiment Station set priorities for research activities with information from the county extension councils, district issues and program committees, and the University of Kentucky Council for Agricultural Research, Extension and Teaching (UK-CARET). UK-CARET functions as an advisory and advocacy group for the College of Agriculture. Members have an opportunity to advise in the development of college priorities and assist in generating public support for those priorities at state and national levels. UK-CARET is representative of the full scope of the land-grant mission:

Extension, research, instruction, and service. Membership is comprised of active and progressive leaders in agricultural and natural resource enterprises. UK-CARET provides a direct link to the national CARET organization. Two members of UK-CARET are designated as national CARET representatives. KSU's CARET representatives work closely with the University and are engaged in advising and representing the interests of its programs. KSU-CARET representatives also participate in national and state policy discussions and assist in the formation of partnerships that will generate programs and resources for KSU's expanded mission with its new college.

In addition, the experiment station meets formally with other entities: quarterly with the Kentucky Tobacco Research Board to set priorities for research by the Kentucky Tobacco Development Center to assist in the transition from the tobacco-based economy; quarterly with the Equine Initiative advisory committee; quarterly with the Livestock Disease Diagnostic Center Advisory committee; bi-annually with the board of the Gluck Equine Research Center to discuss priorities for the equine industry; and regularly with the Tracy Farmer Center for the Environment on conservation-based research. Input is also received through the Community Farm Alliance and other environmental groups through the UK Biotechnology Research and Education Initiative.

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

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

- Use Advisory Committees
- Use Internal Focus Groups
- Use External Focus Groups
- Open Listening Sessions
- Use Surveys
- Other (Program participants; Project Collaborators)

**Brief explanation.**

The Kentucky Cooperative Extension program development process is based on a grassroots, six-stage model that begins with the engagement of local advisory councils for agriculture, 4-H, Family and Consumer Sciences and Extension Homemakers. All program committees used a variety of methods for developing linkages with the public to capture input, including council dialogue and discussion, focus groups, surveys, program evaluations, and working with other local agencies and organizations. Information from program committees are then shared with the total county Extension councils. Membership on these councils includes a broad cross-section of the people in the county representing all demographic and economic segments as well as government, business, education, and community organizations in addition to those identified as under-represented and underserved audiences in extension programs. County Extension Councils assist Extension personnel in identifying program opportunities through which extension and local community organizations could effectively bring about positive change. Councils also help establish program priorities for which county program plans and outcome goals are written. Counties also utilize a process for examining their council makeup and utilize membership committees and a rotation system to ensure new individuals have an opportunity to serve.

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

**1. Methods for collecting Stakeholder Input**

- Meeting with traditional Stakeholder groups
- Survey of traditional Stakeholder groups
- Meeting with traditional Stakeholder individuals
- Survey of traditional Stakeholder individuals
- Survey of the general public
- Meeting specifically with non-traditional individuals
- Meeting with invited selected individuals from the general public
- Survey of selected individuals from the general public
- Other (Serving on advisory groups/councils for organizations)

**Brief explanation.**

Even when Extension advisory councils appear to be broadly representative of the local population, it is possible that established program priorities fail to target important issues. Agents count heavily on their council members to identify program needs but recognize it is a mistake to think that the personal experiences of 15-40 individuals serving on the local Extension council can adequately

identify the needs of the total population. Agents are trained to broaden that expression by involving members of the council in conducting a 'situation analysis.'

Councils use three major sources of information useful in conducting a situation analysis. (1) The first is data that have been collected by other individuals, agencies and/or organizations. This is typically called secondary or existing data.(2)The second is resident perspectives about issues, problems, resources and opportunities.(3)The third information source is current research and knowledge which may have implications for county programming. Extension Councils began the program development process by collecting situational data from these three sources. Council members and Extension staff together or independently pull this information together. Additional meetings of councils are held to review the data and discuss the implications of the findings. The product of this discussion is a list of program opportunities which may merit Extension's involvement. While existing data and current research and knowledge are as close as a computer and the internet, the council delegates themselves must be diligent in capturing local resident perspectives through one or more of several methods. Agents and local leaders were trained in the following methods:

Community Forums - Community forums are public meetings in which individuals are invited to share and discuss their perspectives on issues facing the community.

Focus Group Interviews - A focus group interview is a structured discussion with a small group of eight to twelve individuals on a clearly defined topic.

Key Informant Interviews - In any community, there is a number of individuals who, because of their unique position within the community, can provide important information about local issues and needs.

Surveys - Surveys are a cost effective way of gathering data from a large number of people.

Media Scan - A systematic review of the content of news articles and editorials appearing in local newspapers and on local radio and television stations provides more information about the community.

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

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

#### **Brief explanation.**

Information from stakeholders drives research and extension agendas including our pursuit of resources to conduct research and educational programs. In addition, stakeholder input has been utilized across the board for hiring, budget development, resource acquisition, program implementation, and evaluation. Our stakeholders have also provided a voice in communicating the successes of the organization to campus administrators as well as to outside and nontraditional groups and decision makers.

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

Some of the issues that were identified and/or were under discussion in FY14 included:

Water Quality - a program is in place to promote water education and to assist Kentucky landowners and farmers in developing their Kentucky Ag Water Quality Plans

Fatherhood initiative -Fathering Committee instituted an "Engaging Fathers: Strengthening Families"

initiative to promote parent education among fathers

Military families - Kentucky Extension provided a way to help military families bond and address their needs through camp experiences and other opportunities

Financial Management- Assisting families during these tough economic times remains a priority. Our stakeholders have indicated that families are in need of Extension's up-to-date information regarding financial decisions. Families have also emphasized the need for Extension to continue focusing on educating youth about managing financial resources.

Farm Transitioning/ Beginning Farmers - Emphasis continues to be placed on the need to build upon our beginning farmer program. This intensive education program is targeting those individuals who have ten years or less farming experience. Many of our stakeholders fall into this category or have children who want to gain knowledge on ways to continue with the family tradition

Accessing Healthy Foods - many Kentucky communities are dealing with a shortage of healthy food options. With assistance from stakeholders, Extension has been pivotal in training consumers and producers to

maximize local access to farm-to-table food products

Health Disparities/Weight Management -Obesity continues to be a problem in Kentucky and local residents are very concerned. The epidemic contributes to a host of illnesses, including diabetes. Stakeholders want more current materials that are easily accessible either in the local office or as web-based resources.

Disaster Education Program - Extension is working on programming that provides expert advice and assistance to communities during the times of natural disasters. Stakeholders see this as a priority and resources are being developed and committees have formed. A full-time staff person has also been hired.

Professional Development training for agents/volunteers-With the cost of travel sky-rocketing, stakeholders and agents have dialogued about ways to reduce costs. We continue to promote more Distance Learning Technology to enhance communications and educational efforts through network of videoconferencing sites in key Kentucky counties, saving clientele and personnel time and travel expense and expediting issue response time.

Camp Improvement Initiative - Kentucky 4H heard the voice of stakeholders and have completed a multi-million dollar renovation project at several camps with several revisions on the way.

#### IV. Expenditure Summary

1. Total Actual Formula dollars Allocated (prepopulated from C-REEMS)			
Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
9330579	3228344	6605364	3666643

<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>	8432166	1661720	6051058	1556212
<b>Actual Matching</b>	9330579	751318	24564475	779495
<b>Actual All Other</b>	0	339515	10890867	15084
<b>Total Actual Expended</b>	17762745	2752553	41506400	2350791

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



**V. Planned Program Table of Content**

<b>S. No.</b>	<b>PROGRAM NAME</b>
1	Life Skill Development
2	Leadership and Volunteerism
3	Diet, Nutrition and Healthy Lifestyles
4	Social and Economic Opportunity
5	Global Food Security and Hunger
6	Agricultural and Environmental Quality
7	Food Safety
8	Climate Change
9	Sustainable Energy
10	Childhood Obesity

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

**Program # 1**

**1. Name of the Planned Program**

Life Skill Development

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	3%	5%	0%	100%
802	Human Development and Family Well-Being	52%	88%	20%	0%
803	Sociological and Technological Change Affecting Individuals, Families, and Communities	0%	0%	65%	0%
805	Community Institutions and Social Services	0%	0%	15%	0%
806	Youth Development	45%	7%	0%	0%
	<b>Total</b>	100%	100%	100%	100%

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

1. Actual amount of FTE/SYs expended this Program

Year: 2014	Extension		Research	
	1862	1890	1862	1890
<b>Plan</b>	120.0	16.0	0.5	1.0
<b>Actual Paid</b>	131.0	19.6	3.0	0.1
<b>Actual Volunteer</b>	146741.0	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
2108041	620727	160271	6643
1862 Matching	1890 Matching	1862 Matching	1890 Matching
2332645	265322	929734	1504
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	168108	0

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

**1. Brief description of the Activity**

Through extension specialists, agents, project coordinators, and program assistants, CES will partner with schools, businesses, and local agencies to present programs designed to build life skill opportunities and improve quality of life in adults and youth. Examples include:

- In-service training for extension agents on planning and retirement
- Agents and specialists conducting estate planning and retirement workshops and meetings for adult citizens of Kentucky
- Agents providing extension homemaker lessons on wills and retirement
- Small Steps to Health and Wealth and GPS Programming have become life skills featured programs
- Estate planning and retirement publications will be made available to the public through the web, meetings and activities and county extension offices
- Agents and community collaborators training parents, grandparents and community partners in attachment and literacy building, child development, and preventive and non-violent discipline
- 4-H project groups with six hours or more of teaching time
- One-day 4-H project groups
- Camp classes
- Senior conference track: Child Care- Beyond Babysitting
- Middle school career classes - in school and on Web
- Alternative school day calendar programs
- School-sponsored day care centers for faculty and students
- Family Development and Management program for limited resource families,
- Entrepreneurship Camp for High School Students
- \* STEM-focused enrichment programs for youth

Through research, faculty in the departments of Community and Leadership Development, Family Studies, and Agricultural Economics at UK explore topics such as the interactions of individuals, families, and communities in the context of the mental and physical health of diverse rural, low-income families and creating a framework for STEM content in agriscience education programs.

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

- Agents, community collaborators, and adults interested in financial management and retirement
- Adults with low financial literacy
- Parents with children and grandparents
- 4-H youth from 9 - 19 for project work
- 4-H youth 11 and up for Babysitting and Beyond Youth entrepreneurs
- local government officials and community members

**3. How was eXtension used?**

eXtension was used to access resource materials and contact colleagues for collaboration purposes. Webinars were also attended by state staff and faculty as well as county staff.

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

**1. Standard output measures**

2014	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Actual</b>	985890	4044877	1177232	4741251

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

**Patent Applications Submitted**

Year: 2014

Actual: 0

**Patents listed**

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

**Number of Peer Reviewed Publications**

2014	Extension	Research	Total
<b>Actual</b>	7	2	9

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

**Output Target**

**Output #1**

**Output Measure**

- Published research journal articles

Year	Actual
2014	1

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

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

O. No.	OUTCOME NAME
1	Number of youth and adults who demonstrate increased practical living skills (learned through Extension programming)
2	Number of youth reporting the acquisition of one or more life skills as a result of participation in non-formal youth development programs conducted by Extension.
3	Number of youth and adults who demonstrate informed and effective decision-making.
4	Number of individuals who implemented at least one financial management strategy (e.g., checking credit report, developing a spending plan, etc.)
5	Number of individuals reporting changes in knowledge, skills, opinions or aspirations related to parenting or personal relationships.

**Outcome #1**

**1. Outcome Measures**

Number of youth and adults who demonstrate increased practical living skills (learned through Extension programming)

**2. Associated Institution Types**

- 1862 Extension
- 1890 Extension

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

Year	Actual
2014	267543

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

**Issue (Who cares and Why)**

In Kentucky, it is a priority to invest in youth with leadership and personal development opportunities. In order for young people to serve as competent leaders in the future, they must gain chances to develop the necessary skills today. Youth provide a significant source of human capital through the countless volunteer hours they contribute across the state, Now is the time to educate them on being effective decision makers. We must also strive to keep youth safe and healthy.

**What has been done**

Several Counties have implemented the 4-H Health Rocks! lessons for middle school students. The program was provided to 6th through 8th graders in health/life skills classes. Woodford County Schools encourage teachers to help youth develop a plan for future careers and goals through an entrepreneurial program for fourth and fifth graders.

**Results**

Counties reported an overall drop in the use of drugs and alcohol for 8th and 10th grade students. Over 1,000 youth were involved in sewing projects in the state, with 52 counties having participants.

Parents of one of the participants reported that as a result of her 4-H sewing project experience, his daughter designed and created pillows to be sold through her school entrepreneurial program. The 4-H member created and sold 90 pillows.

**4. Associated Knowledge Areas**

KA Code	Knowledge Area
801	Individual and Family Resource Management

- 802 Human Development and Family Well-Being
- 803 Sociological and Technological Change Affecting Individuals, Families, and Communities
- 805 Community Institutions and Social Services
- 806 Youth Development

**Outcome #2**

**1. Outcome Measures**

Number of youth reporting the acquisition of one or more life skills as a result of participation in non-formal youth development programs conducted by Extension.

**2. Associated Institution Types**

- 1862 Extension
- 1890 Extension

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

Year	Actual
2014	87414

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

**Issue (Who cares and Why)**

Young people are not well-informed when it comes to basic, practical life skills. Many schools today turn to an emphasis on honors classes, college prep, and standardized testing. In turn students are not taught the life skills that they will need to succeed in college and life in general.

**What has been done**

Extension teamed up with elementary teachers in schools, along with volunteer leaders in the community to conduct afterschool Cloverbud clubs, targeting youth ages five to eight years old. CES provided curriculum for the programs as well as training for the volunteer leaders.

CES agents have worked with a number of high school FFA programs. Extension agents and the FFA advisers work with the FFA/Vocational agriculture students to develop their leadership skills by learning the roles that the FFA officers need to fulfill and enter into local and state competitions.

**Results**

This year the FFA chapters in Bullitt County have increased by 25 new members. Both chapters were involved in state competition at the University of Kentucky. Youth have utilized their skills by teaching topics to elementary students, assisting with Farm Safety Day and Youth Farm Field at the Extension Office.

#### 4. Associated Knowledge Areas

KA Code	Knowledge Area
801	Individual and Family Resource Management
802	Human Development and Family Well-Being
803	Sociological and Technological Change Affecting Individuals, Families, and Communities
805	Community Institutions and Social Services
806	Youth Development

#### Outcome #3

##### 1. Outcome Measures

Number of youth and adults who demonstrate informed and effective decision-making.

##### 2. Associated Institution Types

- 1862 Extension
- 1890 Extension

##### 3a. Outcome Type:

Change in Action Outcome Measure

##### 3b. Quantitative Outcome

Year	Actual
2014	72182

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

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

The state of Kentucky has over 640,000 people who are uninsured which equates to approximately 15% of the population. The Affordable Care Act provides a unique opportunity to engage our communities in various capacities and Extension has been presented with opportunities to facilitate many connections to health insurance coverage.

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

Extension formed a partnership with AARP, which has promoted and hosted 6 education and enrollment events throughout the state. These meetings included presentations of the insurance web portal and one-on-one assistance to those who were in need. Events were held in Owensboro, Louisville, Hazard, Mt. Sterling, Lexington and Hopkinsville.

###### **Results**

In order to remain informed about the Affordable Care Act across Kentucky, over 10 meetings were attended at the Kentucky Health Benefit Exchange Office. A total of 542 people attended



across the State. A website was also designed and launched to assist the general public in making informed decisions about the Affordable Care Act.

#### 4. Associated Knowledge Areas

<b>KA Code</b>	<b>Knowledge Area</b>
801	Individual and Family Resource Management
802	Human Development and Family Well-Being
803	Sociological and Technological Change Affecting Individuals, Families, and Communities
806	Youth Development

#### Outcome #4

##### 1. Outcome Measures

Number of individuals who implemented at least one financial management strategy (e.g., checking credit report, developing a spending plan, etc.)

##### 2. Associated Institution Types

- 1862 Extension
- 1890 Extension
- 1862 Research

##### 3a. Outcome Type:

Change in Action Outcome Measure

##### 3b. Quantitative Outcome

<b>Year</b>	<b>Actual</b>
2014	20284

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

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

Tax season can be overwhelming for anyone, but particularly for those with low income. Many may qualify for the Earned Income Tax Credit, but have little knowledge about the resource.

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

Kentucky State University and University of Kentucky Cooperative Extension designed programs to provide introductory financial education to incoming college freshmen and high school seniors who plan to attend college. Moneypower was the program conducted through KSU and It's Your Reality took place on UK's campus. Also, KSU Extension provided Earned Income Tax Credit (EITC) packets, newsletter articles, and information on Volunteer Income Tax Assistance (VITA sites where taxes can be prepared free) to Kentucky FCS Agents and Assistants who promoted the program in counties. EITC was promoted for low income consumers through home and group meetings, food stamp offices, Community Action agencies, newspaper articles, radio, grocery

stores, local housing authorities, and other organizations through University of Kentucky and Kentucky State University Extension agents and assistants.

**Results**

The It's Your Reality Financial Life Skills program participants (UK) overwhelmingly reported positive changes in intended behaviors; most notably 97% reported the intention of thinking more about the impact of a purchase decision on available finances. Over 1000 people received information and over 600 people applied for EITC as a result of receiving the information. Feedback gathered revealed that returns were used to pay bills, buy used appliances, make home repairs, purchase furniture, and purchase clothing for their children. It was also reported that money was spent in local communities to help stimulate the economy.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
801	Individual and Family Resource Management
802	Human Development and Family Well-Being
806	Youth Development

**Outcome #5**

**1. Outcome Measures**

Number of individuals reporting changes in knowledge, skills, opinions or aspirations related to parenting or personal relationships.

**2. Associated Institution Types**

- 1862 Extension
- 1890 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2014	16745

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

**Issue (Who cares and Why)**

According to a Kentucky Youth Advocates' data profile, African American youth were overrepresented in reports made to the Department of Community Based Services for alleged child abuse or neglect compared to their proportion of the youth population. A report in Children and Youth Service Review noted that over 26% of children in grandparent-maintained households have clinically significant levels of emotional and behavioral problems, including learning

disabilities, mental impairment, and school performance difficulties, compared to 10% of children in the general population.

**What has been done**

The Lexington/Fayette County Area FCS Agent and SKY Families Program Assistant (KSU) served as a support to more than 60 families in the delivery of parenting education. One session focuses entirely on how to navigate the child protection system. Parents were provided with the useful publications. A collaborative effort of the Extension service , along with community partners put forth a strategy to develop a plan to help the families raise the children of other relatives.

**Results**

The ongoing monthly support group meetings facilitated by the Family and Consumer Sciences agent has grown in average attendance as well in its purpose. Continuous meetings, circulating resource materials and flyers, as well as promoting through schools and social service agencies has yielded a continuous flow of participants. Fifty-four families were directly impacted through the face to face meetings and over 304 households are contacted regularly regarding the support group organized through Extension programs. One participant noted that they were able to find emotional help for a child, learned how to work with the school teachers to best meet the child's educational needs, communicate with their grown daughter in a more positive way, and learned how to set up their estate plan so the boys could be better cared for in the event of their passing.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
801	Individual and Family Resource Management
802	Human Development and Family Well-Being
806	Youth Development

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

**External factors which affected outcomes**

- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations

**Brief Explanation**

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

**Evaluation Results**

Results are listed in impact statements above (knowledge gained, change in practices)

**Key Items of Evaluation**

Surveys, follow-up interviews, observations, secondary data analysis

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

**Program # 2**

**1. Name of the Planned Program**

Leadership and Volunteerism

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	0%	4%	0%	0%
802	Human Development and Family Well-Being	0%	9%	0%	0%
803	Sociological and Technological Change Affecting Individuals, Families, and Communities	100%	18%	0%	0%
902	Administration of Projects and Programs	0%	20%	0%	24%
903	Communication, Education, and Information Delivery	0%	49%	0%	76%
	<b>Total</b>	100%	100%	0%	100%

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

1. Actual amount of FTE/SYs expended this Program

Year: 2014	Extension		Research	
	1862	1890	1862	1890
<b>Plan</b>	77.0	2.0	0.0	0.0
<b>Actual Paid</b>	67.0	8.3	0.0	6.0
<b>Actual Volunteer</b>	101703.0	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
1096182	341904	0	193655
1862 Matching	1890 Matching	1862 Matching	1890 Matching
1212975	159122	0	85623
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**

- Community leadership development programs will be conducted for the general public as well as training for those serving in leadership roles in extension councils and district boards, extension homemaker organizations and 4-H programs. •Extension will continue to utilize SEAL (Strengthening Extension Advisory Leadership) materials with extension leaders and in training facilitators to conduct local community programs. •Counties will identify volunteers and send them to certification workshops, thereby reaching more 4-H members across Kentucky. •Kentucky 4-H members will receive consistent, uniform education through school enrichment programs, after-school programs, day and /or summer camps and through communications events in the 4-H "Step Up to Leadership" and 4-H Communications - Speeches and Demonstrations projects and programs. Title VI and diversity workshops will be offered to program and county councils.

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

- General public as well as those serving in leadership roles in extension councils and district boards, extension homemaker organizations and 4-H programs •Volunteers from Kentucky counties with appropriate background and experience in subject matter that we can build on for 4-H subject matter and leadership training •"Step up to Leadership" curriculum and activities are designed for youth in grades K-12 Community-based non-profit organizations

**3. How was eXtension used?**

Webinar trainings, reference materials

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

**1. Standard output measures**

2014	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Actual</b>	465476	928344	222614	451716

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

**Patent Applications Submitted**

Year: 2014

Actual: 0

**Patents listed**

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

**Number of Peer Reviewed Publications**

2014	Extension	Research	Total
Actual	8	0	8

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

**Output Target**

**Output #1**

**Output Measure**

- Published research journal articles

Year	Actual
2014	8

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

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

O. No.	OUTCOME NAME
1	Number of people who are involved in addressing significant community issues.
2	Number of people who increase their knowledge of governmental process
3	Number of youth who held leadership and/or advisory positions on community boards
4	Number of youth indicating increased leadership skills, knowledge or confidence through participation in Extension-related leadership programs
5	Number of adults indicating increased leadership skills, knowledge, and/or confidence through participation in volunteer programs related to youth development

**Outcome #1**

**1. Outcome Measures**

Number of people who are involved in addressing significant community issues.

**2. Associated Institution Types**

- 1862 Extension
- 1890 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Condition Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2014	24467

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

**Issue (Who cares and Why)**

Recently, rural communities have experienced major changes. Increasing environmental regulations, food safety, and negative sentiment in the mainstream media are all top concerns. Also, an increase in urban and non-farm residents moving into rural farmland areas are challenges facing today's farmers.

**What has been done**

Motivating and Educating Agricultural Leaders (MEAL) was offered to clientele in Butler, Simpson, Logan, and Warren counties. Sixteen participants participated. MEAL consisted of eight one day sessions. Topics included: The Leader In You; Communications; Issues Management; Media Training; Connection To Consumers; Ag. Law; and Working With Elected Officials.

**Results**

The MEAL program has already produced a level of impact. All class members reported: (1) increased awareness of challenges facing farmers and ranchers (2) strengthened communication skills (3) and being more likely to be an agricultural leader. They have started farm social media pages, contacted policy makers, and become more involved locally. Past MEAL graduates have become strong agricultural leaders in their community. They are serving on local and state agriculture boards, leading local agriculture organizations, and participating and winning state and nationwide agriculture contests.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
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802	Human Development and Family Well-Being
803	Sociological and Technological Change Affecting Individuals, Families, and Communities
903	Communication, Education, and Information Delivery

**Outcome #2**

**1. Outcome Measures**

Number of people who increase their knowledge of governmental process

**2. Associated Institution Types**

- 1862 Extension
- 1890 Extension

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2014	21636

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

**Issue (Who cares and Why)**

In general, the current state of built environments in Kentucky is not effectively supporting the community or economic development efforts in many of our small towns and communities. Many communities, particularly in Eastern Kentucky, have also experienced population decline with the down turn of economic performance. Despite social or economic depression, there are opportunities for these communities to take advantage of their geographic locations to capitalize on economic development through tourism related activities and services while also improving their built environments.

**What has been done**

Motivating and Educating Agricultural Leaders (MEAL) continues to be offered to clientele in several Kentucky counties. Extension has put forth efforts to provide planning and design services to communities that not only enhance a city's built environment but also lay out a foundation to improve tourism related activities. An Extension specialist in landscape architecture also implemented a community development process for Kentucky communities.

**Results**

All MEAL participants reported that they have a better understanding of the legislative process and are more comfortable talking to their legislators after participating (in MEAL). 100% of participants reported that MEAL met their expectations for a leadership program. As an outcome of an Extension-led community engagement and design process, the community was able to

visualize their ideas, visions and needs to improve one particular community's physical landscape. The participants gained experience by working on a real project, listening to and interacting with community-clients, and then communicating their ideas through visualization. As a result, stakeholders from surrounding counties in 3 states have started to meet and discuss the potential for a regional trail system. This multi-county, tri-state communication and relationship building opportunity is utilizing the work that Extension prepared by displaying project posters at regional meetings.

#### 4. Associated Knowledge Areas

KA Code	Knowledge Area
802	Human Development and Family Well-Being
803	Sociological and Technological Change Affecting Individuals, Families, and Communities
903	Communication, Education, and Information Delivery

#### Outcome #3

##### 1. Outcome Measures

Number of youth who held leadership and/or advisory positions on community boards

##### 2. Associated Institution Types

- 1862 Extension
- 1890 Extension

##### 3a. Outcome Type:

Change in Condition Outcome Measure

##### 3b. Quantitative Outcome

Year	Actual
2014	1910

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

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

In society, significant effort is placed on teaching youth the life skills needed to become effective leaders. However, youth rarely get a chance to put these skills into practice. It is imperative that young people are allowed to master and enhance their leadership abilities by having a voice within the communities in which they live.

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

The Kentucky 4-H Learn by Doing approach has successfully served youth across the commonwealth well. Kentucky 4-H leaders have put forth concerted efforts in this approach to youth ages 9-19, to foster the idea of developing life skills in a completed project form which

creates better leaders for tomorrow. Extension partners with local Family Resource Centers (public school facilities) in many counties to develop a plan of action to empower youth to build their leadership skills. In these settings, youth often have a voice on the planning committees.

**Results**

One out of every three youth in Kentucky are exposed to 4-H and learned the skills of future leaders. In Monroe County, a backpack program is being led through the efforts of 4-H teens. The program has grown to support 180 children each week for the months of September through May. With collaborative efforts from churches, individuals, and other organizations, a total of 1,235 backpacks of food have been delivered weekly to the children of Monroe County and now over \$10,000 is raised annually in private donations to support the program. This project continues to be a youth-led model that demonstrates how youth leadership can make a difference in changing the community when working as equal partners with adults.

**4. Associated Knowledge Areas**

KA Code	Knowledge Area
802	Human Development and Family Well-Being
803	Sociological and Technological Change Affecting Individuals, Families, and Communities
903	Communication, Education, and Information Delivery

**Outcome #4**

**1. Outcome Measures**

Number of youth indicating increased leadership skills, knowledge or confidence through participation in Extension-related leadership programs

**2. Associated Institution Types**

- 1862 Extension
- 1890 Extension

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

Year	Actual
2014	57640

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

**Issue (Who cares and Why)**

All youth deserve the right to gain the confidence they need to feel good about themselves and set out to achieve their goals. However, a number of youth do not have access to programs that foster their personal development. Without the aid of leadership activities, youth may lack

confidence in their leadership potential and their own sense of identity and effective social skills could be minimized.

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

Kentucky 4-H reached a record number of youth and adults who attended the 4-H Teen Leadership Conference in 2014. A total of 682 people, including 570 youth, 30 volunteers and 82 extension agents participated in the annual conference. The conference led by 50 State Teen Council members had a very successful four days on the University of Kentucky campus. In addition, 64 Georgia delegates, 9 Pennsylvania delegates and chaperons also attended the conference. As a result of KSU's Youth Voice: Youth Choice collaboration, approximately 200 youth were engaged on a regular basis in some type of physical activity and/or organized sport, exposing youth to positive role models and culturally relevant programming. CES conducted middle and high school programs throughout the year to encourage leadership, develop communication and decision making skills.

#### **Results**

In one county, as a result of the Teen Leadership conferences and other activities, 87% of the 120 teens involved reported having greater self-confidence and 90% of the teens believe they are ready to lead a younger group of 4-H participants. In another county, over 700 youth engaged in leadership opportunities to help improve self-esteem and communication skills. About 80% of these teens participated in more than one leadership opportunity and indicated they would continue to become more involved in 4-H leadership opportunities in the future. Youth involved in the Kentucky State University's Youth Entrepreneur Development program started a farmer's market, in conjunction with, the University of Kentucky Agriculture Extension Office, Fayette County Public Schools, and the local Health Department.

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

<b>KA Code</b>	<b>Knowledge Area</b>
802	Human Development and Family Well-Being
803	Sociological and Technological Change Affecting Individuals, Families, and Communities
903	Communication, Education, and Information Delivery

#### **Outcome #5**

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

Number of adults indicating increased leadership skills, knowledge, and/or confidence through participation in volunteer programs related to youth development

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

- 1862 Extension
- 1890 Extension

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

Change in Knowledge Outcome Measure

### 3b. Quantitative Outcome

Year	Actual
2014	10245

### 3c. Qualitative Outcome or Impact Statement

#### Issue (Who cares and Why)

Identifying an adequate number of high quality volunteers is always a challenge. Volunteers serve as an important element of the youth development program. Attaining a diverse community representation of volunteers and allowing them to have ownership of the program will ensure community youth development needs can be addressed.

#### What has been done

County Extension offices networked with community organizations (i.e. Kentucky Farm Bureau, County Fair Board, school systems) and community leaders to identify and recruit individuals to serve on the 4-H Council and volunteer for other youth related programs. Also, the Volunteer Administrations Academy continues to endow agents with the tools, resources and knowledge necessary to build, enhance and expand their current volunteer programs throughout Kentucky.

#### Results

As a result of the volunteer academy, two resources were created. MyExtensionStories.com is an on-line template designed to gather the stories told by Extension volunteers related to their experiences in volunteering and the impact that the volunteer role has had upon their lives. ExtensionVolunteer.com is an on-line volunteer orientation website, designed to provide orientation and in-service development to all types of Extension volunteers. One county reported approximately 3,072 hours in teaching and community service, 237 recorded volunteers contributed \$64,146.00 in volunteer time.

### 4. Associated Knowledge Areas

KA Code	Knowledge Area
802	Human Development and Family Well-Being
803	Sociological and Technological Change Affecting Individuals, Families, and Communities
903	Communication, Education, and Information Delivery

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

#### External factors which affected outcomes

- Economy
- Public Policy changes
- Competing Public priorities
- Competing Programmatic Challenges

#### Brief Explanation

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

**Evaluation Results**

Increase in volunteers leading program efforts; youth leading community based program efforts; increase in number of youth and adult volunteers/partnerships

**Key Items of Evaluation**

Surveys, qualitative feedback from participants

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

**Program # 3**

**1. Name of the Planned Program**

Diet, Nutrition and Healthy Lifestyles

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	0%	0%	23%	0%
503	Quality Maintenance in Storing and Marketing Food Products	0%	0%	8%	0%
701	Nutrient Composition of Food	0%	0%	0%	100%
702	Requirements and Function of Nutrients and Other Food Components	0%	0%	15%	0%
703	Nutrition Education and Behavior	97%	85%	0%	0%
721	Insects and Other Pests Affecting Humans	0%	0%	32%	0%
722	Zoonotic Diseases and Parasites Affecting Humans	0%	0%	7%	0%
723	Hazards to Human Health and Safety	0%	0%	15%	0%
724	Healthy Lifestyle	3%	15%	0%	0%
	<b>Total</b>	100%	100%	100%	100%

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

1. Actual amount of FTE/SYs expended this Program

Year: 2014	Extension		Research	
	1862	1890	1862	1890
<b>Plan</b>	95.0	2.5	3.0	1.0
<b>Actual Paid</b>	70.0	3.2	6.0	0.1
<b>Actual Volunteer</b>	39308.0	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
1096182	33306	257058	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
1212975	17552	1863085	889
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	103637	788508	0

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

**1. Brief description of the Activity**

- Contacts with clientele related to diet and health will include volunteer training, health fairs, Extension Homemaker leader lessons, safe night programs, healthy homes programs, and more.
- Multidisciplinary programs aimed at strengthening local food systems. Examples of programs to be offered will include: 4-H school enrichment, after-school programs and day and/or summer camp programs on 4-H Jump into Foods and Fitness. Weight--the Reality Series - Body Image and Get Moving Kentucky physical activity and weight management programs, LEAP-Literacy, Eating and Activity for Preschool Program and Exploring MyPyramid with Professor Popcorn for elementary school age children.
- EFNEP - Expanded Food and Nutrition Educational Program for low income families with children.
- Multi-agency activities related to diet and health.
- Continued research in the areas of nutrient effects on high-fat diets, antioxidant effects on cancer prevention, environmental effects on nutrient requirements and more.

Major research efforts in this program area include: • Food consumption and physical activity are being examined as indicators of risk for obesity in preschool children. •The combined effects of selected vegetables on bone metabolism are under study as it pertains to osteoporosis. • The nutritional status and health of agricultural workers. • Bioprotective effects of phytochemicals to mediate immunity and antigenotoxic potential

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

- Extension agents
- Community agencies
- Volunteer leaders
- Parents
- Grandparents
- General public
- Public housing residents
- Scientific community
- Jump into Food and Fitness participants: curriculum designed for youth ages 8-11

**3. How was eXtension used?**

Print materials, networking with colleagues, participating in webinars

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

**1. Standard output measures**



2014	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Actual</b>	639336	2413862	348556	1189836

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

**Patent Applications Submitted**

Year: 2014

Actual: 0

**Patents listed**

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

**Number of Peer Reviewed Publications**

2014	Extension	Research	Total
<b>Actual</b>	11	26	37

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

**Output Target**

**Output #1**

**Output Measure**

- Published research journal articles

Year	Actual
2014	24

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

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

O. No.	OUTCOME NAME
1	Number of individuals who experienced an increase in knowledge, opinions, skills or aspirations regarding lifestyle changes (diet, exercise, healthy home practices, managing stress, etc.) that improve personal health
2	Number of individuals who made lifestyle changes (diet, exercise, healthy home practices, managing stress, etc.) for the purpose of improving their health
3	Number of individuals implementing personal health protection practices (screening, immunizations, well-baby care, preventive health practices, etc.)
4	Number of individuals who reported practice changes related to safety (use of bicycle helmets, fire extinguishers, tractor roll bars, radon testing, smoke detectors, proper ATV operation, etc.).

## **Outcome #1**

### **1. Outcome Measures**

Number of individuals who experienced an increase in knowledge, opinions, skills or aspirations regarding lifestyle changes (diet, exercise, healthy home practices, managing stress, etc.) that improve personal health

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

- 1862 Extension
- 1890 Extension
- 1862 Research

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

Change in Knowledge Outcome Measure

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

<b>Year</b>	<b>Actual</b>
2014	110810

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

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

According to the annual State Indicator Report on Fruits and Vegetables by the CDC, over 40% of the adolescents and over 25% of the adults in Kentucky do not consume the recommended amount of fruits and vegetables. Also, a high percentage of youth and adults are not getting enough physical exercise.

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

KSU received a grant from the Wal-mart Foundation and National 4-H Council to promote a healthy lifestyles program (Youth Voice). Also, KSU's Food Security Initiative produced the Thorobred Nutrition Kitchen and subsequently developed a plan for mobile market service. Events promoting physical activity (Second Sunday, 5K runs) have been organized by Extension and local partners.

#### **Results**

As a result of KSU's Youth Voice: Youth Choice collaboration, approximately 100 children, youth and families were provided the skills to identify and select healthy food options in their own communities. The students learning about the various origins of food raised their awareness of obesity and its health implications. In addition, the youth were exposed to endless career opportunities that existed in the agri-science industry from both a workforce development and entrepreneur perspective. Also, over the past few years, the number of participants in the KSU EFNEP program has increased from 500 youth to nearly 900 and 90 families per year. In addition, the graduation rate has been over 90% each year. In one county, Extension helped plan fun runs ( 5K, 10K & Half Marathon) and raised over \$1,000 to be matched two to one by a grant awarded by the Foundation for a Healthy Kentucky. Over 50 people ran in the 5K, 40 in the 10K and 12 in

the half marathon.

#### 4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior
723	Hazards to Human Health and Safety
724	Healthy Lifestyle

#### Outcome #2

##### 1. Outcome Measures

Number of individuals who made lifestyle changes (diet, exercise, healthy home practices, managing stress, etc.) for the purpose of improving their health

##### 2. Associated Institution Types

- 1862 Extension
- 1890 Extension
- 1862 Research

##### 3a. Outcome Type:

Change in Action Outcome Measure

##### 3b. Quantitative Outcome

Year	Actual
2014	42411

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

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

Consuming a diet high in fiber, low in fat, cholesterol, sodium and sugar, and reducing serving sizes to avoid overeating is a major health concern among nutrition and health professionals. Less than 20% of the adult population eats the recommended number of fruit and vegetable servings. The number of Kentuckians engaging in exercise is also at an all-time low.

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

The Clinton County Cooperative Extension Service implemented a workplace wellness program (Weight the Reality Series) for employees at a local business. A total of 43 employees registered for the program which included condensed educational lessons, weekly weigh-in, physical activity, recipe sampling, and blood pressure checks. In Henry County, Biggest Loser teams were organized to encourage weight loss.

###### **Results**

For the Clinton County program, at the end of the eight week series, 44% of participants experienced a decrease in BMI (body mass index). In Henry County, 70 participants on 16 teams lost a total of 878.6 pounds during the Biggest Loser competition and 19 individuals joined a Community Walking Program.

#### 4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior
723	Hazards to Human Health and Safety
724	Healthy Lifestyle

#### Outcome #3

##### 1. Outcome Measures

Number of individuals implementing personal health protection practices (screening, immunizations, well-baby care, preventive health practices, etc.)

##### 2. Associated Institution Types

- 1862 Extension
- 1890 Extension

##### 3a. Outcome Type:

Change in Action Outcome Measure

##### 3b. Quantitative Outcome

Year	Actual
2014	16965

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

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

In 1995, approximately 3.5% of Kentucky adults (120,000 adults) had been diagnosed with diabetes, by 2010, the prevalence rate for diabetes had increased to 10% or approximately 370,000 adults. Recently, this rate is slightly higher at 10.7% of Kentucky Adults. Diabetes has significant health consequences such kidney disease, diabetic ketoacidosis, heart disease and amputation. In Kentucky, these complications results in over \$353 million in medical costs.

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

The Taking Ownership of Your Diabetes program provided a resource for 475 individuals and families in Kentucky.

###### **Results**

Of the participating individuals, 90% were seen by their health professional as a means of managing their diabetes; 72% had their A1C checked; and 85% checked their blood glucose 1 or

more times a day, and; over 50% were able to solve daily problems related to managing their diabetes. Because participants have been exposed to proper ways of managing their diabetes, as this program entails, they have demonstrated the ability to make better health choices and experience a higher quality of life.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
703	Nutrition Education and Behavior
723	Hazards to Human Health and Safety
724	Healthy Lifestyle

**Outcome #4**

**1. Outcome Measures**

Number of individuals who reported practice changes related to safety (use of bicycle helmets, fire extinguishers, tractor roll bars, radon testing, smoke detectors, proper ATV operation, etc.).

**2. Associated Institution Types**

- 1862 Extension
- 1890 Extension

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2014	19000

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

**Issue (Who cares and Why)**

The chance of falling and being seriously injured in a fall increases with age. Approximately one-third of seniors 65 years and older fall in Kentucky each year. The Kentucky Injury Prevention and Research Center reports that older patients who are hospitalized for falling are six times more likely than younger patients to be discharged into a nursing home. Fall related injuries for seniors cost around \$20 billion a year and if suffering from bone or joint disease one is more likely to take a fall and lose a sense of independence.

**What has been done**

The Nourish Your Bones and Joints program was conducted by Extension for the Louisville Area Extension Homemakers (a total of 58 lesson leaders who shared the information with over 900 club members).

**Results**

Participants set 42 goals related to improving bones and joint health following the lesson and when asked what they planned to do as a result of what they learned, participant responses included such goals as exercising more, eating more nutritious meals and snacks, adding calcium supplements, counting daily calcium intakes, having a discussion with their physician, and spreading the information they learned to others. Thirty percent reported implementing some of these lifestyle changes in the month following the program.

#### 4. Associated Knowledge Areas

KA Code	Knowledge Area
723	Hazards to Human Health and Safety

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

##### External factors which affected outcomes

- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges

##### Brief Explanation

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

##### Evaluation Results

Implementation of key health practices

##### Key Items of Evaluation

Surveys, focus group discussions, one-on-one interviews

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

**Program # 4**

**1. Name of the Planned Program**

Social and Economic Opportunity

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	0%	100%	27%	100%
602	Business Management, Finance, and Taxation	2%	0%	10%	0%
603	Market Economics	0%	0%	12%	0%
604	Marketing and Distribution Practices	19%	0%	9%	0%
605	Natural Resource and Environmental Economics	0%	0%	25%	0%
606	International Trade and Development Economics	0%	0%	10%	0%
607	Consumer Economics	0%	0%	7%	0%
608	Community Resource Planning and Development	78%	0%	0%	0%
610	Domestic Policy Analysis	1%	0%	0%	0%
	<b>Total</b>	100%	100%	100%	100%

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

1. Actual amount of FTE/SYs expended this Program

Year: 2014	Extension		Research	
	1862	1890	1862	1890
<b>Plan</b>	25.0	2.5	5.0	1.5
<b>Actual Paid</b>	31.0	3.7	19.7	2.0
<b>Actual Volunteer</b>	26827.0	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
505930	86886	351002	35472
1862 Matching	1890 Matching	1862 Matching	1890 Matching
559835	38940	1627451	29700
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	79741	1310204	0

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

**1. Brief description of the Activity**

- Delivery of educational programming and workshops on topics such as understanding community dynamics, asset analysis, business planning, marketing and hospitality management
- Efforts to educate producers about marketing and adding value to Kentucky Agricultural products including MarketMaker, Agritourism, Farmers Markets, Kentucky Proud Campaign, specialty livestock markets and marketing programs, Kentucky Entrepreneurial Institute, etc.
- Formation of nontraditional advisory councils in the areas of community and economic development, tourism, agritourism, and arts where appropriate need and resources are identified
- Research projects including estimating how changing agricultural trade policies and macroeconomic conditions influence U.S. agricultural exports, university engagement in community-based organizations in the Black Belt South, and urban vs. rural food access and cost
- The Family Economics and Management Program will focus on Earned Income Credit and Tax Credit opportunities for Kentucky Families. Youth entrepreneurship education Entrepreneurial development and outreach to educate local officials and leaders on the importance of planning for economic development

KSU has research projects are focusing on aquaculture and livestock integrated into a farm analysis for limited resource farmers and documenting oral histories of black farmers in Kentucky.

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

- county extension agents
- Kentucky crop, livestock, produce producers
- entrepreneurs
- agritourism providers
- active and potential community leaders
- 4-H members
- scientific community
- High school students, teachers, and counselors

1. Locally elected and appointed officials

**3. How was eXtension used?**

Extension personnel utilized webinars and printed materials

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

**1. Standard output measures**

2014	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Actual</b>	430028	6328758	64110	542152

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

**Patent Applications Submitted**

Year: 2014

Actual: 0

**Patents listed**

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

**Number of Peer Reviewed Publications**

2014	Extension	Research	Total
<b>Actual</b>	6	5	11

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

**Output Target**

**Output #1**

**Output Measure**

- Published research journal articles

Year	Actual
2014	2

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

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

O. No.	OUTCOME NAME
1	Number of new coalitions formed as a result of Extension efforts
2	Number of individuals reporting changes in knowledge, opinions, skills or aspirations related to economic or enterprise development
3	Number of farmers self-reporting an increase in profits as a result of adopting one or more practices recommended by Extension
4	Number of citizens (youth & adults) utilizing skills learned through Extension programming

**Outcome #1**

**1. Outcome Measures**

Number of new coalitions formed as a result of Extension efforts

**2. Associated Institution Types**

- 1862 Extension
- 1890 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2014	316

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

**Issue (Who cares and Why)**

With significant issues affecting Kentucky residents, Extension must rely on its networks and community partners to address the needs of all citizens.

**What has been done**

Representatives from KSU program areas collaborated with the Lexington Leadership Foundation and other community resource providers to help provide valuable parenting resources at an annual Fathers Day Celebration.

Extension's beginning farmer program, KyFarmStart partnered with Catholic Charities of Louisville to serve the refugee community in Jefferson Co. With the assistance of two part-time "community ag workers" (one from Bhutan and the other from Somalia) funded and trained through KyFarmStart, 86 urban farmers were assisted.

**Results**

Participants of the KyFarmStart program used Extension's assistance to provide some of the food they eat and, according to a community ag worker working with the program, helped with both their physical health (they are both diabetic) and their mental health (keeping them active since they can't work). They sold some of their produce, earning approximately \$1700.

**4. Associated Knowledge Areas**

**KA Code    Knowledge Area**

- 604 Marketing and Distribution Practices
- 608 Community Resource Planning and Development

**Outcome #2**

**1. Outcome Measures**

Number of individuals reporting changes in knowledge, opinions, skills or aspirations related to economic or enterprise development

**2. Associated Institution Types**

- 1862 Extension
- 1890 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

Year	Actual
2014	32138

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

**Issue (Who cares and Why)**

With the changing economy, the agricultural climate in Kentucky must adapt to thrive in today's market. There is a challenge in getting producers to explore unfamiliar opportunities.

**What has been done**

The KyFarmStart program provides beginning farmers with the education and experiences they need to make better decisions and develop successful and sustainable whole farm plans.

Kentucky State University is conducting hemp variety trials on certified organic land in 2014, to determine yield of hemp varieties that show promise for certified organic production on small farms in Kentucky. Hemp is also being compared to commonly cultivated summer smother crops, buckwheat and sorghum-sudangrass, to test its competitiveness against Johnsongrass on organic land.

**Results**

The KyFarmStart program reached more than 540 beginning farmers in over 50 Kentucky counties as of 2014. Ninety-six percent of survey respondents found the program useful and 62% had participated in other programs offered at their local CES office due to their participation in this program. Roughly 85% of survey respondents reported confidence in their ability to manage their farm business as a result of participation in the course.

Farm tours and field days have allowed regional farmers to evaluate some of the first legally-grown hemp in generations. Knowledge gained from these initial trials (led by KSU) has allowed farmers to make informed decisions about variety selection and potential organic crop rotations.

#### 4. Associated Knowledge Areas

<b>KA Code</b>	<b>Knowledge Area</b>
601	Economics of Agricultural Production and Farm Management
602	Business Management, Finance, and Taxation
603	Market Economics
604	Marketing and Distribution Practices
605	Natural Resource and Environmental Economics
607	Consumer Economics
608	Community Resource Planning and Development
610	Domestic Policy Analysis

#### Outcome #3

##### 1. Outcome Measures

Number of farmers self-reporting an increase in profits as a result of adopting one or more practices recommended by Extension

##### 2. Associated Institution Types

- 1862 Extension
- 1890 Extension

##### 3a. Outcome Type:

Change in Condition Outcome Measure

##### 3b. Quantitative Outcome

<b>Year</b>	<b>Actual</b>
2014	11586

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

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

Extension is faced with the demands of helping producers broaden their horizons and explore new ways to increase profits. Many farmers have limited knowledge of how to implement practices that can yield positive results. Extension is working to aid Kentucky growers.

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

Extension assisted in establishing a new USDA inspected meat processing facility in Wolfe

County, KY. High tunnel vegetable production has increased significantly in western Kentucky. Metcalfe County Extension partnered with local and regional partners (health department, farmers market participants, Barren River Food Systems Alliance, etc.) to help revitalize the use of the local farmers market. Clark County Extension collaborated with a producer/volunteer who hosted a black plastic mulch demonstration.

### Results

As a result of Extension programming, 50 producers attended the high tunnel vegetable conference and 72% of participants rated the conference as significant or very significant for their operations. The successes of Metcalfe County includes: establishing a part-time (volunteer) farmers market manager; enrolling eight new participants who accept WIC vouchers, and; established a five person board of directors. In Clark County, the producer hosting the black plastic mulch demonstration reported an income increase of 40% from his vegetable operation. In addition, 2 other producers have implemented the black plastic technology, and trickle irrigation in their operation.

## 4. Associated Knowledge Areas

KA Code	Knowledge Area
602	Business Management, Finance, and Taxation
604	Marketing and Distribution Practices
607	Consumer Economics
608	Community Resource Planning and Development

## Outcome #4

### 1. Outcome Measures

Number of citizens (youth & adults) utilizing skills learned through Extension programming

### 2. Associated Institution Types

- 1862 Extension
- 1890 Extension
- 1862 Research

### 3a. Outcome Type:

Change in Action Outcome Measure

### 3b. Quantitative Outcome

Year	Actual
2014	142771

### 3c. Qualitative Outcome or Impact Statement

**Issue (Who cares and Why)**

In the last few years there has been a tremendous amount of growth in the request for information on environmentally balanced horticultural practices. With an influx of Green industry jobs and other opportunities, there remains a lack of good environmental educational resources.

**What has been done**

Bullitt County Extension has developed a Biodiversity Program. This past year The Biodiversity Program offered six classes to homeowners and members of the community covering such topics as Composting, Butterfly and Hummingbird Gardening, Great Native Alternatives, Upcycling Garden Art, Rain Gardens and Nine Months of Color in Shade. A total of 96 residents participated.

**Results**

Offering low impact solutions to common problems and stressing environmental responsibility have great impact on the 96 Bullitt County participants. Roughly 65% reported making changes to behavior based on class information. A total of 32 reported an increase in wildlife around their property and 21 reported better use of runoff water as a result of what they learned through the program.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
601	Economics of Agricultural Production and Farm Management
602	Business Management, Finance, and Taxation
603	Market Economics
604	Marketing and Distribution Practices
605	Natural Resource and Environmental Economics
606	International Trade and Development Economics
607	Consumer Economics
608	Community Resource Planning and Development

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

**External factors which affected outcomes**

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

**Brief Explanation**



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

**Evaluation Results**

Increase in application of knowledge and skills learned as a result of program participation

**Key Items of Evaluation**

Survey responses, qualitative feedback, observations

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

**Program # 5**

**1. Name of the Planned Program**

Global Food Security and Hunger

Reporting on this Program

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

**1. Program Knowledge Areas and Percentage**

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
102	Soil, Plant, Water, Nutrient Relationships	0%	0%	0%	2%
201	Plant Genome, Genetics, and Genetic Mechanisms	0%	0%	10%	10%
205	Plant Management Systems	57%	10%	7%	1%
211	Insects, Mites, and Other Arthropods Affecting Plants	0%	0%	20%	2%
212	Diseases and Nematodes Affecting Plants	0%	0%	13%	0%
215	Biological Control of Pests Affecting Plants	0%	0%	12%	2%
216	Integrated Pest Management Systems	0%	0%	1%	0%
301	Reproductive Performance of Animals	0%	0%	11%	0%
302	Nutrient Utilization in Animals	0%	0%	10%	0%
303	Genetic Improvement of Animals	0%	0%	0%	4%
304	Animal Genome	0%	0%	4%	0%
307	Animal Management Systems	38%	88%	3%	71%
311	Animal Diseases	0%	0%	9%	0%
401	Structures, Facilities, and General Purpose Farm Supplies	0%	0%	0%	1%
601	Economics of Agricultural Production and Farm Management	0%	1%	0%	7%
604	Marketing and Distribution Practices	5%	0%	0%	0%
704	Nutrition and Hunger in the Population	0%	1%	0%	0%
	<b>Total</b>	100%	100%	100%	100%

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

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

Year: 2014	Extension		Research	
	1862	1890	1862	1890
<b>Plan</b>	180.0	15.0	50.0	12.0
<b>Actual Paid</b>	164.0	15.5	115.7	17.4

<b>Actual Volunteer</b>	24803.0	0.0	0.0	0.0
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**2. Actual dollars expended in this Program (includes Carryover Funds from previous years)**

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
2613971	468825	3523015	657132
1862 Matching	1890 Matching	1862 Matching	1890 Matching
2892479	212279	13157826	328045
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	52500	5800196	11313

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

**1. Brief description of the Activity**

The development and transfer of technical resources is a critical dimension of a strategy to advance agriculture and the competitiveness of the state's agricultural economy.

- Field days, demonstration programs, plotwork and hands-on training by agents and specialists will continue to be important mechanisms for disseminating technical information on production agriculture and horticulture
- Printed material, mass media, Web sites, audio, and electronic communications will be employed to disseminate the latest research findings on decision-making
- Featured programs for this plan of work cycle will include: Grain Crops Academy, Master Grazer Program, Horse College and the Innovative Tobacco Producer Program
- Goat Production and Management Programs
- Small Farm Program at KSU will focus on needs of small and limited resource farmers,
- The Kentucky Fruit and Vegetable Conference plays a major role in commercial horticultural producer education
- Third Thursday programs will be conducted at KSU and their research and demonstration farms will attract small and limited resource farmers and will also serve as training for County Extension Agents and students
- Aquaculture and Fish Disease/Management Programs
- Master Cattlemen and advanced Master Cattlemen programs will be conducted
- Educational programs qualifying producers to receive Tobacco Settlement funds in the areas of goats, forages, bull selection and hay storage will improve producer skills in these areas
- New Research findings from KSU's Aquaculture Research center, pawpaw, goats, and honeybees will be the subject of field days and meetings to bolster the expanding alternative in Kentucky and the Southern Region Demonstration and training for appropriate production and processing of pastured poultry and honey.
- Home-based processing training
- On-site food demonstrations
- Ongoing research at UK supporting competitive agriculture includes:
  - improvements in plant pest and disease resistance
  - optimization of cropping system inputs for maximum cost/benefit
  - improvements in animal reproductive efficiency
  - vaccine and other intervention development to improve animal health
  - engineering solutions for sustainable plant and animal production
  - optimization of animal nutrition
  - interventions to improve access to healthy food in Appalachia
  - biological pest control
  - fundamental investigations of plant, animal and pathogen biology
  - new applications for unmanned vehicles and sensors in crop management

KSU has active research areas in areas of:
 

- Aquaculture projects are concerned with the commercialization of paddlefish, nutrition and diet formulation for freshwater crustaceans, and developing

technologies for raising largemouth bass. • Doe and kid production evaluation for meat goats is a relatively new research and extension thrust for KSU. • Pawpaw and primocane blackberries are under development as niche crops in Kentucky. • The control of Nosema diseases is being researched as a potential cause of colony collapse disorder (CCD) of honey bees.

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

• Kentucky farmer operations with agents recruiting and selecting producers for participation in Grain Academy, Master Cattlemen, Innovative Tobacco Grower Program, Horse College, and Master Grazer Programs •Farm owners, operators, absentee land owners with a variety of backgrounds and experiences •Farmers' market members and potential members •Community and farm leaders •Consumers •Extension agents

**3. How was eXtension used?**

Webinars, printed materials, Extension personnel signed up for "ask an expert"

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

**1. Standard output measures**

2014	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Actual</b>	1555682	11915182	70324	539036

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

**Patent Applications Submitted**

Year: 2014  
 Actual: 0

**Patents listed**

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

**Number of Peer Reviewed Publications**

2014	Extension	Research	Total
<b>Actual</b>	14	134	148

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

**Output Target**

**Output #1**

**Output Measure**

- Published research journal articles

2014 University of Kentucky and Kentucky State University Combined Research and Extension Annual Report of Accomplishments and Results

<b>Year</b>	<b>Actual</b>
2014	112

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

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

O. No.	OUTCOME NAME
1	Number of families who gained knowledge about eating healthy foods
2	Number of families that reported eating more healthy foods
3	Number of families that reported supplementing their diets with healthy foods that they produced/preserved (utilizing community/backyard gardens, fishing, hunting, etc.)
4	Number of individuals adopting one or more recommended practices to increase access to food or make it more affordable
5	Availability of new targets for developing broad spectrum resistance to crop diseases
6	Availability of improved disease diagnostic tools

## **Outcome #1**

### **1. Outcome Measures**

Number of families who gained knowledge about eating healthy foods

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

- 1862 Extension
- 1890 Extension
- 1862 Research

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

Change in Knowledge Outcome Measure

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

<b>Year</b>	<b>Actual</b>
2014	146600

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

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

Today's families lack the knowledge of basic nutrition education, lack skills in growing and preparing nutritious foods, and budgeting for food costs. Kentucky Extension has partnered with several local collaborators to address this issue.

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

Lawrence County SNAP-Ed and EFNEP nutrition education programs (NEP) reach children, youth and families with basic nutrition education, skills in food preparation, gardening, and food budgeting. Both NEP assistants graduated 55 families at the end of the reporting year. Boyd County Extension has been working to raise money that supports homeless and low-income families. The Lee County Cooperative Extension Service offered nutrition education programs to low-income family groups in an effort to help them provide better nutrition to their children.

Kentucky State University Extension taught food shopping, nutritional labeling, unit pricing, and tips on eating healthy fast food to High School students in Lexington, KY.

#### **Results**

In Lawrence County, 100% of the enrolled families reported positive changes; 48% improved in resource management skills; and 63% improved on diet quality/nutrition. In addition to teaching enrolled families, NEP assistants taught LEAP (Literacy, Eating, and Activity) to approximately 400 Pre-K through 3 grade students at four (4) elementary schools; and also taught food safety to approximately 1700 K-8 grade students at three (3) elementary schools and one middle school. About 75% of the students reported gaining knowledge of food safety and correct hand washing practices.

Boyd County Extension assisting in raising over \$20,000 to combat hunger. Volunteers involved were able to witness firsthand the need for communities to work together to address critical issues.

KSU Extension contributed to students learning how to develop a shopping list; checking newspaper ads; reading food labels; using coupons; using unit pricing; and learning tips on eating healthy fast food. A lesson evaluation indicated that 70% of the students will use the shopping skills the next time they go shopping.

#### 4. Associated Knowledge Areas

<b>KA Code</b>	<b>Knowledge Area</b>
102	Soil, Plant, Water, Nutrient Relationships
205	Plant Management Systems
211	Insects, Mites, and Other Arthropods Affecting Plants
212	Diseases and Nematodes Affecting Plants
215	Biological Control of Pests Affecting Plants
301	Reproductive Performance of Animals
302	Nutrient Utilization in Animals
303	Genetic Improvement of Animals
307	Animal Management Systems
311	Animal Diseases
401	Structures, Facilities, and General Purpose Farm Supplies
601	Economics of Agricultural Production and Farm Management
604	Marketing and Distribution Practices
704	Nutrition and Hunger in the Population

#### Outcome #2

##### 1. Outcome Measures

Number of families that reported eating more healthy foods

##### 2. Associated Institution Types

- 1862 Extension
- 1890 Extension
- 1862 Research

##### 3a. Outcome Type:

Change in Action Outcome Measure



### 3b. Quantitative Outcome

Year	Actual
2014	55645

### 3c. Qualitative Outcome or Impact Statement

#### Issue (Who cares and Why)

Today's families lack the knowledge of basic nutrition education, lack skills in growing and preparing nutritious foods, and budgeting for food costs. Kentucky has partnered with several local collaborators to address this issue. Extensions SNAP-Ed and EFNEP programs have also made significant strides.

#### What has been done

Jefferson County Extension helped education families on the importance of consuming fruits, vegetables, grains, protein or dairy foods. Anderson County conducted an Eating Around the World project.

#### Results

In Jefferson County, 100% of SNAP-Ed Program participants and 96% of Jefferson County EFNEP participants showed a positive change in their consumption of fruits, vegetables, grains, protein or dairy foods. Additionally, Jefferson County Cooperative Extension agents and program assistants completed 1,127 Snap-Education hours, reaching 7,908 people. In Anderson County, participants completed surveys which indicated that the cooking school helped them prepare healthier meals (14 out of 18), taught them food safety (11/18), encouraged them to try new local foods (18/18), how to read food labels (15/18) and how to adapt recipes to be lower in calories and fat (13/19).

### 4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems
216	Integrated Pest Management Systems
307	Animal Management Systems
401	Structures, Facilities, and General Purpose Farm Supplies
604	Marketing and Distribution Practices
704	Nutrition and Hunger in the Population

### Outcome #3

#### 1. Outcome Measures

Number of families that reported supplementing their diets with healthy foods that they produced/preserved (utilizing community/backyard gardens, fishing, hunting, etc.)

#### 2. Associated Institution Types

- 1862 Extension
- 1890 Extension

### 3a. Outcome Type:

Change in Action Outcome Measure

### 3b. Quantitative Outcome

Year	Actual
2014	27836

### 3c. Qualitative Outcome or Impact Statement

#### Issue (Who cares and Why)

Good nutrition is important to individuals and families regardless of where they may be in the life cycle. Proper nutrition can often help alleviate and prevent many ailments common to Kentuckians. Many communities fall short of helping families prepare more nutritious meals.

#### What has been done

Lyon County worked with Hispanic families to improve on ways to preserve foods. Extension is working with the migrant program in Garrard County to teach families how to prepare healthier meals. The Boone County Cooperative Extension Service is teaching elementary students about growing food through a hands-on gardening project.

#### Results

In Garrard County, 100% of the participants learned how to create vegetable pizza using fresh raw vegetables with a spread and crust; 100% of participants have repeated the recipes and prepared the healthier alternatives at home. In Boone County, as the harvest is made, the students assisted a local food processor, to process and package the vegetables into salsa that is sold as a fundraiser. To date, over \$45,000 worth of salsa has been sold.

## 4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems
311	Animal Diseases
604	Marketing and Distribution Practices
704	Nutrition and Hunger in the Population

#### **Outcome #4**

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

Number of individuals adopting one or more recommended practices to increase access to food or make it more affordable

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

- 1862 Extension

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

Change in Action Outcome Measure

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

<b>Year</b>	<b>Actual</b>
2014	31950

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

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

Throughout the US, it has been demonstrated that many of our urban centers and some rural communities have been declared Food Deserts. The ability to access healthy foods is difficult and the resulting health challenges place local citizens at risk for disease.

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

Extension has worked with Appalachian Alternative Agriculture for Jackson County (3AJC) to operate the Jackson County Regional Food Center and Farmers Market. The food processing kitchen has been rented by approximately 30 to 35 local and regional producers to develop, process, package and label their products for market thus increasing revenues during this time.

KSU Extension assisted Minority farmers and veteran farmers to connect with local churches by providing high-quality produce at a cheaper cost to limited-resourced communities. KSU also produced the Thorobred Nutrition Kitchen and subsequently developed a plan for mobile market service.

###### **Results**

The Jackson County Regional food center has educated 150 families on developing skills in regard to producing and processing their home garden products.

In a western part of the state (Mammoth Cave area) that is still known as a food desert, there are more than 200 families being fed due to KSU Extension's efforts to build networks between farmers and residents. These families now have access to healthy foods at a cost they can afford.

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

<b>KA Code</b>	<b>Knowledge Area</b>
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205	Plant Management Systems
307	Animal Management Systems
604	Marketing and Distribution Practices
704	Nutrition and Hunger in the Population

## **Outcome #5**

### **1. Outcome Measures**

Availability of new targets for developing broad spectrum resistance to crop diseases

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

- 1862 Research

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

Change in Knowledge Outcome Measure

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

<b>Year</b>	<b>Actual</b>
2014	0

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

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

Plant diseases have a devastating impact on agricultural production every year and annual worldwide crop losses due to disease have been estimated in excess of \$100 billion. Current strategies to protect plants from diseases involve the use of genetic resistance, chemical treatments, and farming practices. These methods generally offer partial protection often only against specific pathogen strains. Strategies involving the induction of intrinsic defense responses, or recognition of pathogen-specific elicitors, offer viable alternatives and have the potential to protect against a broad spectrum of pathogens. Developing such sustainable crop protection approaches requires knowledge of the signaling mechanisms involved in defense. Thus, the elucidation of signal transduction pathway(s) following pathogen recognition could eventually aid the targeted manipulation of defense responses without affecting crop yield.

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

Research at UK aims to understand how plants perceive pathogens and how primary metabolic pathways interface with defense signaling. Studies are identifying and characterizing defense signaling components from soybean for pathogens, including *Pseudomonas syringae* pv. *glycinea* (Psg), Soybean mosaic virus (SMV), and *Phytophthora sojae*. Components of resistance protein-derived pathways and the proteins interacting with pathogens are being identified and characterized. Further components of the low oleic acid-mediated defense pathway as well as biochemical activities contributing to glycerol-3-phosphate synthesis during defense are being studied.

### Results

Critical results include the identification of soybean proteins that interact with effector proteins from bacterial pathogens and regulate their virulence as well as the proteins and mechanisms involved in the activation of the resistance protein Rpg1-b. This work has shown that nitric oxide and reactive oxygen species function as signals during the plant systemic immune response and that plant galactolipids are crucial for the generation of these signals during systemic immunity. Researchers have identified three soybean genes contributing to the synthesis of glycerol-3-phosphate. Identification of these factors can now be used to generate resistance to a variety of pathogens in crop plants without significantly affecting plant growth, development, and ultimately yields. Of special interest is the identification of precursors that generate a mobile inducer of systemic immunity in plants. This mobile inducer can now be developed as a treatment that provides broad spectrum and long lasting resistance in the field.

### 4. Associated Knowledge Areas

KA Code	Knowledge Area
212	Diseases and Nematodes Affecting Plants

### Outcome #6

#### 1. Outcome Measures

Availability of improved disease diagnostic tools

#### 2. Associated Institution Types

- 1862 Extension
- 1862 Research

#### 3a. Outcome Type:

Change in Knowledge Outcome Measure

#### 3b. Quantitative Outcome

Year	Actual
2014	0

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

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

Verticillium wilt affects 80 tree species and more than 300 plant species, and is responsible for substantial economic losses each year. The fungus survives for long time in the soil and symptoms of the disease in plants can mimic a number of other diseases or problems. Diagnosis of Verticillium wilt is further complicated by the difficulty of isolating the fungus in the laboratory. The disease is often spread by dispersing infected plants not yet showing disease symptoms. Fungicides are often not effective against Verticillium, thus early diagnosis is critical to proper management of the disease.

**What has been done**

UK plant pathologists evaluated real-time PCR-based assays for rapid and accurate detection of *Verticillium dahliae* in different woody hosts. Researchers extracted DNA from *Verticillium* infected trees using shavings collected via drill press. Six published primer sets were evaluated against genomic DNA of *V. dahliae* as well as selected negative controls. Two sets of primers showed promise for further evaluation using DNA extracts from field samples.

**Results**

While both candidate primers amplified species-specific fragments, one primer set, VertBt, exhibited higher sensitivity in detection of *V. dahliae* even in asymptomatic trees. This finding provides plant diagnosticians with a new tool to accurately and quickly detect *Verticillium* in woody plants before signs of the disease occur. By detecting the disease early, its spread through the sale of asymptomatic plants can be avoided.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
212	Diseases and Nematodes Affecting Plants

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

**External factors which affected outcomes**

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

**Brief Explanation**

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

**Evaluation Results**

Increase in knowledge of growing, purchasing and consuming healthy foods; Increased access to healthy foods

**Key Items of Evaluation**

Surveys, follow-up interviews, observations

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

**Program # 6**

**1. Name of the Planned Program**

Agricultural and Environmental Quality

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
101	Appraisal of Soil Resources	0%	0%	5%	0%
102	Soil, Plant, Water, Nutrient Relationships	0%	3%	35%	3%
104	Protect Soil from Harmful Effects of Natural Elements	0%	0%	3%	11%
112	Watershed Protection and Management	2%	22%	9%	8%
123	Management and Sustainability of Forest Resources	22%	25%	0%	4%
131	Alternative Uses of Land	0%	3%	0%	2%
132	Weather and Climate	0%	16%	0%	2%
133	Pollution Prevention and Mitigation	0%	0%	8%	6%
135	Aquatic and Terrestrial Wildlife	0%	3%	0%	0%
136	Conservation of Biological Diversity	0%	3%	0%	0%
201	Plant Genome, Genetics, and Genetic Mechanisms	0%	0%	0%	4%
205	Plant Management Systems	19%	0%	16%	10%
211	Insects, Mites, and Other Arthropods Affecting Plants	0%	0%	0%	4%
213	Weeds Affecting Plants	0%	0%	9%	0%
215	Biological Control of Pests Affecting Plants	0%	0%	0%	9%
302	Nutrient Utilization in Animals	0%	0%	6%	0%
401	Structures, Facilities, and General Purpose Farm Supplies	0%	9%	0%	37%
403	Waste Disposal, Recycling, and Reuse	3%	16%	9%	0%
605	Natural Resource and Environmental Economics	54%	0%	0%	0%
	<b>Total</b>	100%	100%	100%	100%

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

1. Actual amount of FTE/SYs expended this Program

Year: 2014	Extension		Research	
	1862	1890	1862	1890
<b>Plan</b>	35.0	2.0	10.0	5.0
<b>Actual Paid</b>	25.0	3.2	31.5	11.3
<b>Actual Volunteer</b>	27975.0	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
421608	72687	737135	370147
<b>1862 Matching</b>	<b>1890 Matching</b>	<b>1862 Matching</b>	<b>1890 Matching</b>
466529	40619	3891831	173605
<b>1862 All Other</b>	<b>1890 All Other</b>	<b>1862 All Other</b>	<b>1890 All Other</b>
0	0	1827408	0

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

**1. Brief description of the Activity**

The University of Kentucky and Kentucky State University are engaged in a wide range of programs geared towards achieving greater harmony between agriculture, people, and the environment. All components of the research and extension focus on the broader goal of practicing agricultural and related disciplines in a manner consistent with improving sustainability of resources and protecting ecosystem integrity. Program examples include:

- Master Gardener Program consisting of 12-15 three-hour sessions related to gardening, resource management, botany, soils, pesticides and pesticide safety
- Master Logger program consisting of three one-day sessions focusing on best management practices, safety, laws and regulations
- Integrated Pest Management programs including programs aimed at homeowner application of pesticides and fertilizers.
- Woodlot owner education program focusing on best management practices, harvesting, contracts, wood products and alternative forest products.
- Water quality, Water Pioneer, daycamps, and forestry camp programs aimed at developing a better understanding of stewardship between youth and the environment.

Agricultural and environmental research at UK included: •riparian management techniques for improving water quality in karst dominated landscapes •new production systems to improve animal agriculture sustainability •fundamental investigations of biodiversity and community structure in agricultural and forest ecosystems •methods for dealing with insect pests of urban landscapes •assessing the environmental benefits of organic farming •investigation of physical and chemical processes in soils that impact productivity and soil quality

•KSU Extension Programs will continue to support efforts related to policies to improve environmental quality •Gardendata.org •Organic Agricultural Programs

KSU research projects focusing on improving environmental quality include: soil conditioners and constructed wetlands for water quality improvement, the ecological impact of organic and conventional



cropping methods are being evaluated.

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

- General public
- Community volunteers advanced in horticulture instruction and willing to give back to the community
- Individual commercial loggers in Kentucky and those out of state wishing to do business in Kentucky
- Woodlot owners
- Farm owners and operators
- Homeowners

**3. How was eXtension used?**

Data on websites, webinars, communities of practice

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

**1. Standard output measures**

2014	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Actual</b>	238833	645834	112449	282550

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

**Patent Applications Submitted**

Year: 2014

Actual: 0

**Patents listed**

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

**Number of Peer Reviewed Publications**

2014	Extension	Research	Total
<b>Actual</b>	1	25	26

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

**Output Target**

**Output #1**

**Output Measure**

- Published research journal articles

Year	Actual
2014	11

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

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

O. No.	OUTCOME NAME
1	Number of producers adopting resource management technologies (IRM, IPM, soil testing, soil fertility management) as a result of Extension programs
2	Number of individuals adopting practices (recommended by Extension) that ensure safe water
3	Number of individuals utilizing forest management practices recommended by Extension
4	Number of individuals who made a lifestyle change for the purpose of improving water and/or natural resources (due to recommendations from Extension)
5	Availability of optimized endophyte- tall fescue combinations for sustainable forage systems

**Outcome #1**

**1. Outcome Measures**

Number of producers adopting resource management technologies (IRM, IPM, soil testing, soil fertility management) as a result of Extension programs

**2. Associated Institution Types**

- 1862 Extension
- 1890 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2014	21616

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

**Issue (Who cares and Why)**

There is an increased demand in popular culture for local food, reduced chemical usage and preserving ones own (home or locally grown) food.

**What has been done**

Bullitt County Extension assisted the Orchard Production series to teach homeowners to grow and properly manage fruit trees, allowing residents to grow low impact (agriculturally sound practices) fruit, and increase production while minimizing chemical use. Using research based information from KSU and U of K and specialists in fruit production, this program employs a series of classes on topics such as pruning, spraying, grafting and others to educate participants in the most recent techniques in fruit and orchard production.

The Master Marketer program was organized, consisting of 5 sessions including topics on (1) Feeder cattle quality, price discovery, and sale day consideration, (2) Using the futures market to manage price risk, (3) Advanced futures and options strategies, (4) and assist in decision making for stocker operations.

Kentucky State University collaborated with organic seed suppliers and farmers affiliated with the Organic Valley cooperative to demonstrate successful regional production of organic corn, and to identify organic varieties that are well adapted to the Mid-East region. Twenty-six organic farmer collaborators in six states participated in on-farm comparisons of 34 organic corn varieties.

**Results**

In Bullitt County, With an increased participation of 12%, this Orchard Production series continues to grow and develop. Having gained knowledge, participants now use fewer chemicals (23%

reported reduction in chemical usage), produce more quality fruit (52% reported) and save time and effort. Some participants developed home based businesses (9% reported) based on fruit production and/or improved their business profit margin (by 32%) by utilizing learned techniques.

The Master Marketer program increased producer knowledge of basic marketing and price risk management skills.

In Jefferson County, KSU and UK Hort agents worked to organize the first Master Gardener class since 2009. A total of 10 master gardeners completed 30 or more volunteer hours within the last year. Many have shown great enthusiasm for volunteering and have sought out new volunteer opportunities in the city to engage and inform people about the wonderful work of Extension.

All 26 organic farmer collaborators (in the Organic Valley Collaborative) demonstrated excellent yields from a wide range of organic corn varieties. The average organic corn yield for the trial was 159 bushels per acre, equivalent to the average conventional corn yield for the region.

#### 4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management
123	Management and Sustainability of Forest Resources
133	Pollution Prevention and Mitigation

#### Outcome #2

##### 1. Outcome Measures

Number of individuals adopting practices (recommended by Extension) that ensure safe water

##### 2. Associated Institution Types

- 1862 Extension
- 1862 Research

##### 3a. Outcome Type:

Change in Action Outcome Measure

##### 3b. Quantitative Outcome

Year	Actual
2014	19069

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

**Issue (Who cares and Why)**

There was a need for more agricultural professional training to educate landowners on environmental stewardship and water quality.

**What has been done**

Extension hosted projects that provided a comprehensive source of information on agriculture and water quality.

**Results**

Twelve trainings were held for a total of 18.5 instructional days throughout Kentucky, reaching approximately 188 agricultural service providers. Post-training evaluations indicated 85 percent of attendees understood the components of a nutrient management plan (NMP); 86 percent understood who could write a NMP; 87 percent understood how to incorporate additional Best Management Practices (BMPs) into Ag Water Quality Plans and NMPs to manage nutrients; and 87 percent knew what tools are available to assist with plan development.

In one Kentucky County, about 5 respondents said they installed a rain garden to help capture water/rain runoff.

KSU Extension assisted in building an Urban Demonstration farm in the heart of the African American community in Russellville Kentucky. The Project provides fresh Fruits and Vegetable, along with educational meetings on Aquaponics, High Tunnels, Marketing and Nutrition.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
102	Soil, Plant, Water, Nutrient Relationships
112	Watershed Protection and Management
123	Management and Sustainability of Forest Resources
133	Pollution Prevention and Mitigation

**Outcome #3**

**1. Outcome Measures**

Number of individuals utilizing forest management practices recommended by Extension

**2. Associated Institution Types**

- 1862 Extension
- 1890 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

### 3b. Quantitative Outcome

Year	Actual
2014	3962

### 3c. Qualitative Outcome or Impact Statement

#### Issue (Who cares and Why)

Kentucky's forests cover nearly half the Commonwealth but only scattered information had existed on the overall economic impact of Kentucky's forest and wood industry.

The Appalachian forests were forever changed when a fungus decimated the American Chestnuts in the 1930's. Prior to the arrival of the blight, chestnuts made up as much as 70% of the forest canopy in the Appalachian region. The wood of these trees was easy to turn for furniture-makers, easy to mill for lumber, light-weight, attractive in color and very rot resistant. Additionally, the tree bloomed in late spring; avoiding killing frosts and producing abundant annual crops that fed both wildlife and people with a highly sought-after nut. This was America's preeminent nut and lumber tree. The cost of its loss was beyond measure.

#### What has been done

Letcher County Extension has worked to promote a re-establishment of the American Chestnut species.

Extension specialists and agents worked together to create and/or revise new Extension publications as reference materials. Next, key publications from all disciplines were compiled into resource guides for agents. A team including specialists in plant pathology, entomology, and horticulture provided a series of six train-the-trainer workshops, each including one half-day intense classroom program and then one half-day field training.

Kentucky Extension assisted in a total of 4 multi-day workshops conducted for all Forest Inventory and Analysis crews operating in the 13 southern states.

Spencer County Extension hosted a series of webinars developed by the University of Kentucky Department of Forestry which focused on Tree Identification, Selling Timber, Waterfowl Identification, and Woodland Management.

#### Results

As a result of the efforts, Letcher County plot trees have attained 40 feet of growth and have reproduced. The seed has been planted to expand the plot. No sign of the blight has been observed in the plot.

In Spencer County, all participants reported that their knowledge had increased as a result of the webinars and one person who participated in both a previous field day and the webinar session on selling timber sold approximately 50,000 board feet for an economic return of nearly \$17,000.00 for the timber, less costs for the harvesting company and mill.

## 4. Associated Knowledge Areas

KA Code	Knowledge Area
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102	Soil, Plant, Water, Nutrient Relationships
123	Management and Sustainability of Forest Resources
131	Alternative Uses of Land

#### **Outcome #4**

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

Number of individuals who made a lifestyle change for the purpose of improving water and/or natural resources (due to recommendations from Extension)

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

- 1862 Extension
- 1890 Extension
- 1862 Research

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

Change in Action Outcome Measure

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

<b>Year</b>	<b>Actual</b>
2014	8583

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

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

Water quality is important for all Kentuckians. The University of Kentucky reports that 90% of the states rural population is self-supplied through wells and springs, and 226 public water supplies rely on groundwater. Curry's Fork and Floyds Fork are major watersheds for multiple counties in the Louisville area and have been noted as having waters that contain some contaminants including sedimentation (soil runoff).

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

Using the Project WET curriculum and resources secured through a 4-H20 Community Project grant, Extension taught students the basics of water quality before allowing them to venture into water sources to determine the quality of the water.

In an effort to educate clients about protecting water, Oldham County Extension worked one on one with cost-share applicants to help them complete or update agriculture water quality plans for their farms. An Ag Water Quality field day was also held.

###### **Results**

In Morgan County, 25 students participated in the Project WET program. The evaluation summary revealed that 100% understood the importance of the need to help keep water sources clean and

healthy. Sixty percent were able to identify how aquatic macro invertebrates are indicators of good, moderate, or poor water quality.

As a result of Oldham County Extension's contributing efforts, six people completed ag water quality plans for the first time. Ten people attended the workshop and learned techniques for managing mud and manure, best management practices and how to complete an ag water quality plan; 100% of those responding said they learned something new about how to protect water. Three people incorporated a new practice to protect water using what they learned. Two people updated their ag water quality plans. Four people said they gained information they will use to help or teach others about protecting water.

#### 4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
112	Watershed Protection and Management
123	Management and Sustainability of Forest Resources
131	Alternative Uses of Land
403	Waste Disposal, Recycling, and Reuse

#### Outcome #5

##### 1. Outcome Measures

Availability of optimized endophyte- tall fescue combinations for sustainable forage systems

##### 2. Associated Institution Types

- 1862 Research

##### 3a. Outcome Type:

Change in Knowledge Outcome Measure

##### 3b. Quantitative Outcome

Year	Actual
2014	0

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

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

Tall fescue covers greater than 15 million hectares within the United States and is considered one of the most desirable forage species for grazing livestock. Tall fescue has garnered a lot of attention because the shoot-specific fungal endophyte it harbors produces toxic alkaloids resulting in animal sickness and loss of productivity. As a result novel endophyte infected varieties have been produced that maintain the positive attributes of the resident fungus, but



eliminates the alkaloids toxic to grazing animals. There is evidence from pastures dominated by common toxic endophyte infected tall fescue that there is a slower turnover of carbon and other nutrients. Research is needed to specifically addresses the influence that novel endophyte-tall fescue cultivar combinations have on plant root system architecture and root exudate composition or how these two act together to help the plant better resist abiotic stresses, and more broadly, to alter ecosystem structure and function, including nutrient availability.

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

Studies were conducted to investigate the effects of different phosphorus concentrations on the biomass, P uptake and root system architecture of a cultivar of tall fescue without endophytes, infected with the common toxic endophyte, or infected with one of two novel endophyte types. A follow-up study investigated how the source of phosphorus and its degree of solubility influenced P uptake in the same endophyte-tall fescue combinations.

#### **Results**

Results indicated that plant biomass and P acquisition were influenced by the specific fungal endophyte-grass association. The fungal endophyte genotypes were found to interact with the host plant to alter the root system architecture to result in greater P acquisition, particularly under limited P conditions. Phosphorus source was found to influence the level of P uptake as well. Overall this study shows that morphological changes in the roots system of tall fescue due to endophyte infection are influenced by P source and concentration. The implications of these results are that endophyte infection enhances a plant's response under low P conditions by altering root system architecture and that the extent and ultimately the success (in terms of increased nutrient acquisition) of this response is governed by the P source and endophyte strain. Overall these studies indicate that some tall fescue and endophyte combinations may be better suited for certain soil types depending on the chemical form of nutrients present. This information will be used to develop recommendations for pasture management that optimize nutrient utilization for minimizing inputs and maximizing biomass production.

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

<b>KA Code</b>	<b>Knowledge Area</b>
102	Soil, Plant, Water, Nutrient Relationships

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

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

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Government Regulations
- Competing Programmatic Challenges

##### **Brief Explanation**

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

##### **Evaluation Results**

Change in knowledge, skills and opinions; practice change

**Key Items of Evaluation**

Pre-post surveys, structured interviews, observations, analysis of secondary data

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

**Program # 7**

**1. Name of the Planned Program**

Food Safety

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
501	New and Improved Food Processing Technologies	10%	0%	49%	0%
703	Nutrition Education and Behavior	78%	50%	0%	0%
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources	0%	50%	2%	36%
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	12%	0%	49%	64%
<b>Total</b>		100%	100%	100%	100%

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

1. Actual amount of FTE/SYs expended this Program

Year: 2014	Extension		Research	
	1862	1890	1862	1890
<b>Plan</b>	12.0	0.5	2.0	1.0
<b>Actual Paid</b>	12.0	0.2	7.1	5.9
<b>Actual Volunteer</b>	3922.0	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
168643	1003	432063	232626
1862 Matching	1890 Matching	1862 Matching	1890 Matching
186612	1892	864933	109274
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	503593	3771

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

**1. Brief description of the Activity**

- Training and certification workshops will be conducted for home-based microprocessors
- Research was conducted on the identification of best practices to reduce contamination of food pathogens and toxins in pre- and post- harvest environments
- Research programs also included better detection methods for monitoring food risks and analysis of the impacts of food safety incidences on the food supply chain
- Educational programs will be targeted toward parents and others who prepare food in the home
- Educational programs will be directed toward young children and teens on basic cleanliness such as hand washing

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

- extension agents
- food producers
- food processors
- parents
- volunteer leaders
- youth and children
- consumers

**3. How was eXtension used?**

Print materials, ask an expert

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

**1. Standard output measures**

2014	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Actual</b>	111356	1043213	28273	259801

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

**Patent Applications Submitted**

Year: 2014

Actual: 0

**Patents listed**

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

**Number of Peer Reviewed Publications**

2014	Extension	Research	Total
Actual	5	12	17

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

**Output Target**

**Output #1**

**Output Measure**

- Published research journal articles

Year	Actual
2014	8

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

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

O. No.	OUTCOME NAME
1	Number of individuals who experienced a change in knowledge, opinions, skills or aspirations regarding the safe storage, handling, or preparation of food (safe preservation techniques, hand washing, following time and temperature guidelines)
2	Number of individuals who implemented recommended practices for the safe storage, handling or preparation of food (safe preservation techniques, hand washing, following time and temperature guidelines)
3	Total number of individuals reached through Extension programming related to health and safety

**Outcome #1**

**1. Outcome Measures**

Number of individuals who experienced a change in knowledge, opinions, skills or aspirations regarding the safe storage, handling, or preparation of food (safe preservation techniques, hand washing, following time and temperature guidelines)

**2. Associated Institution Types**

- 1862 Extension
- 1890 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2014	57497

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

**Issue (Who cares and Why)**

The CDC estimates 1 in 6 Americans, or roughly 48 million people, get sick from food borne illnesses each year. The Home-based Processor and Microprocessor program began as a way to increase farm profits by allowing Kentucky farmers to use their home kitchens to produce certain value-added products for sale at farmers markets, roadside stands, or their farms. However, many have limited knowledge of the difference between low-risk and higher risk products and the safety requirement of each.

**What has been done**

Kentucky Extension offers an average of 6 home-based microprocessor workshops each year.

Clinton County Cooperative Extension Service taught food safety information including sanitation, ways to prepare food, and proper food storage to individuals and groups throughout the community. A total of 127 individuals have participated in lessons involving food safety.

**Results**

Of the 399 producers who attended an HBM workshop, 62 have had their recipes approved and have been certified to process and sell over 350 value-added home-canned products.

**4. Associated Knowledge Areas**

**KA Code    Knowledge Area**

- 711      Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources
- 712      Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

**Outcome #2**

**1. Outcome Measures**

Number of individuals who implemented recommended practices for the safe storage, handling or preparation of food (safe preservation techniques, hand washing, following time and temperature guidelines)

**2. Associated Institution Types**

- 1862 Extension
- 1890 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2014	29187

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

**Issue (Who cares and Why)**

The CDC estimates 1 in 6 Americans, or roughly 48 million people, get sick from food borne illnesses each year. Many residents operative businesses involving food preparation are not aware of the requirements to operate these types of businesses.

**What has been done**

Kentucky Extension offers home-based microprocessor workshops each year (both face-to-face and virtually).

Clinton County Cooperative Extension Service taught food safety information including sanitation, ways to prepare food, and proper food storage to individuals and groups throughout the community. A total of 127 individuals have participated in lessons involving food safety.

**Results**

All participants were given the opportunity to practice using a meat thermometer to check proper internal temperatures of cooked meat products. Furthermore, each participant was given a meat thermometer to take home to ensure that they continue to exercise the food safety precautions discussed during the lesson. Follow-up evaluation measures indicated that 112 participants were continuing to use their meat thermometers at home, and continued to practice other safety



techniques discussed.

Building on the success of the Home-based Processor and Microprocessor program, some farmers have expanded the sale of their value-added products to the commercial market. One of these is a Kenton County farmer who started selling her pepper jellies at her local farmers market in the fall of 2012, and whose products are now offered for sale online and at nine retail stores across Kentucky.

#### 4. Associated Knowledge Areas

KA Code	Knowledge Area
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

#### Outcome #3

##### 1. Outcome Measures

Total number of individuals reached through Extension programming related to health and safety

##### 2. Associated Institution Types

- 1862 Extension
- 1890 Extension

##### 3a. Outcome Type:

Change in Knowledge Outcome Measure

##### 3b. Quantitative Outcome

Year	Actual
2014	165496

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

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

Economic stressors on family budgets have resulted in an increase in home gardening and food preservation. The local food movement has gained interest and popularity in Central Kentucky in recent years, and as more families plant vegetable gardens or make large purchases at local Farmers Markets, the need for information about food preservation skills has also increased.

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

Extension has arranged a series of Canning 101 classes as well as a hands-on Canning Camp series across the state.

### Results

Written surveys completed at the end of sessions and workshops indicated that participants felt that they had received enough information to feel confident to can high acid foods on their own. Many believed that they were ready to try pressure canning and most felt confident that they could save \$20 to \$30 a month on their food budgets by canning or freezing the food they grow themselves.

## 4. Associated Knowledge Areas

KA Code	Knowledge Area
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

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

#### External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Government Regulations
- Competing Programmatic Challenges

#### Brief Explanation

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

#### Evaluation Results

Raised awareness, increase in knowledge, healthy practices (in preparing/storing/preserving foods)

#### Key Items of Evaluation

Survey, follow up interviews, focus group discussions

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

**Program # 8**

**1. Name of the Planned Program**

Climate Change

Reporting on this Program

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

**1. Program Knowledge Areas and Percentage**

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
102	Soil, Plant, Water, Nutrient Relationships	0%	0%	50%	24%
123	Management and Sustainability of Forest Resources	0%	0%	50%	76%
604	Marketing and Distribution Practices	100%	0%	0%	0%
	<b>Total</b>	100%	0%	100%	100%

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

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

Year: 2014	Extension		Research	
	1862	1890	1862	1890
<b>Plan</b>	3.0	0.5	1.0	1.0
<b>Actual Paid</b>	1.0	0.0	3.2	1.7
<b>Actual Volunteer</b>	1.0	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
84322	0	99306	48607
1862 Matching	1890 Matching	1862 Matching	1890 Matching
93306	0	410401	38501
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	100137	0

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

**1. Brief description of the Activity**

- Emergency preparedness plans will be implemented with be prepared for all Extension offices
- The Agricultural Weather Center will supply information on temperature and moisture conditions to guide agricultural operations
- Economists will conduct educational programs for Extension agents and agricultural producers on ways to reduce risks
- Research on the impact of climate change on the ecology of plant pests and diseases
- Creation of new technologies and best management practices for mitigating greenhouse gas emissions and managing production systems in a changing climate
- KSU offered a floating science lab to show students the impact of climate and human use on aquatic systems and conducted some forest management development.

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

- extension agents
- extension office staff
- agricultural producers
- community leaders
- general public

**3. How was eXtension used?**

Participation in webinars

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

**1. Standard output measures**

2014	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Actual</b>	460	28	0	0

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

**Patent Applications Submitted**

Year: 2014  
 Actual: 0

**Patents listed**

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

**Number of Peer Reviewed Publications**

2014	Extension	Research	Total
<b>Actual</b>	3	5	8

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

**Output Target**

**Output #1**

**Output Measure**

- Published research journal articles.

<b>Year</b>	<b>Actual</b>
2014	4

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

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

O. No.	OUTCOME NAME
1	Number of individuals reporting changes in knowledge, opinions, skills or aspirations related to the impact of public policies on agriculture and the environment
2	Number of individuals reporting an increase in knowledge, opinions, skills or aspirations related to climate change

## **Outcome #1**

### **1. Outcome Measures**

Number of individuals reporting changes in knowledge, opinions, skills or aspirations related to the impact of public policies on agriculture and the environment

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

- 1862 Extension
- 1862 Research

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

Change in Knowledge Outcome Measure

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

<b>Year</b>	<b>Actual</b>
2014	25061

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

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

In the last few years there has been a tremendous amount of growth in the request for information on climate change and environmentally balanced agricultural practices. With an influx of Green industry and a lack of high quality environmental educational resources, Extension has opportunities and challenges that lie ahead.

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

Bullitt County Extension has developed a Biodiversity Program.

The Forest Inventory and Analysis Extension program conducts inventories of the condition of the forest in each state that are used to track forest growth, use, and health.

#### **Results**

Reported changes in knowledge in relation to climate change is due to Continuing outputs that include agent training, Extension publications, radio tapes, media interviews, and collaborations across the nation.

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

<b>KA Code</b>	<b>Knowledge Area</b>
604	Marketing and Distribution Practices

## **Outcome #2**

### **1. Outcome Measures**

Number of individuals reporting an increase in knowledge, opinions, skills or aspirations related to climate change

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

- 1862 Extension
- 1890 Extension

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

Change in Knowledge Outcome Measure

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

<b>Year</b>	<b>Actual</b>
2014	9509

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

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

In the last few years there has been a tremendous amount of growth in the request for information on climate change and environmentally balanced agricultural practices. With an influx of Green industry and a lack of high quality environmental educational resources, Extension has opportunities and challenges that lie ahead.

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

KSU Extension was awarded a \$1,000 grant from NOAA to implement a climate change awareness campaign at Kentucky State University with the Minorities in Agriculture, Natural Resources, and Related Sciences (MANRRS) Student Chapter. The projects aim was to train fifteen MANRRS students on basic climate science issues so that they could design and create an educational campaign about the simple changes individuals can make to reduce CO2 emissions on campus and within communities.

#### **Results**

After learning about basic climate science and human impacts, students ran a strategic planning session to determine how they would disseminate the information that they acquired at the training and decided that they would design reusable shopping bags containing climate change literature and sustainability tips printed on the bags. Participants took a post-test to assess knowledge gained from the initiative. There was a 43.4% average increase in knowledge gained on the topic of climate change.

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

<b>KA Code</b>	<b>Knowledge Area</b>
604	Marketing and Distribution Practices



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

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

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Government Regulations
- Competing Programmatic Challenges

#### **Brief Explanation**

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

#### **Evaluation Results**

Increase in knowledge/awareness of climate change

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

Surveys, pre-post tests, follow up interviews

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

**Program # 9**

**1. Name of the Planned Program**

Sustainable Energy

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
131	Alternative Uses of Land	0%	50%	0%	0%
201	Plant Genome, Genetics, and Genetic Mechanisms	0%	0%	25%	0%
204	Plant Product Quality and Utility (Preharvest)	4%	0%	25%	100%
205	Plant Management Systems	0%	0%	50%	0%
402	Engineering Systems and Equipment	96%	50%	0%	0%
	<b>Total</b>	100%	100%	100%	100%

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

1. Actual amount of FTE/SYs expended this Program

Year: 2014	Extension		Research	
	1862	1890	1862	1890
<b>Plan</b>	5.4	0.5	5.0	1.0
<b>Actual Paid</b>	1.0	0.2	12.5	0.4
<b>Actual Volunteer</b>	288.0	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
84322	9737	491208	11930
1862 Matching	1890 Matching	1862 Matching	1890 Matching
93306	4173	1815584	11480
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	392713	0

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

**1. Brief description of the Activity**

Sustainable energy research continues to be an important component of plant science and biosystems engineering research programs at the University of Kentucky. Research in energy science included both basic studies in plant biology for developing improved feedstocks and applied, pilot- scale demonstrations of bio-based production processes. The production and utilization of switchgrass as a feedstock continues to be an area of emphasis for our research and extension programs. Another important area of research for UK's programs is the improvement of oilseeds for energy applications and other bio-based chemical development.

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

- producers
- extension agents
- electric company representatives
- other researchers and extension specialists

**3. How was eXtension used?**

Webinars, printed materials

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

**1. Standard output measures**

2014	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Actual</b>	7543	442594	7853	1572

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

**Patent Applications Submitted**

Year: 2014  
 Actual: 1

**Patents listed**

Chappell, J. Rerouting the photorespiration pathway in plants for increasing bioproduct yield. Application 20140283219. Issued August 8, 2014.

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

**Number of Peer Reviewed Publications**

2014	Extension	Research	Total
<b>Actual</b>	2	5	7

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

**Output Target**

**Output #1**

**Output Measure**

- Published research journal articles

<b>Year</b>	<b>Actual</b>
2014	2

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

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

O. No.	OUTCOME NAME
1	Number of individuals who reported an increase in knowledge of sustainable energy as a result of Extension related programming
2	Number of individuals who incorporated practices suggested by Extension that promote sustainable energy (i.e., applied water conservation policies, participating in energy audits, installed energy efficient equipment, etc.)
3	Number of producers who reported an increase in their production of bioenergy crops (corn, soybeans, switchgrass, etc.)
4	Number of youth reporting an increase in knowledge of energy conservation practices
5	Expanding available lignocellulose-degrading enzymes for bio-based energy and industrial applications

## **Outcome #1**

### **1. Outcome Measures**

Number of individuals who reported an increase in knowledge of sustainable energy as a result of Extension related programming

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

- 1862 Extension
- 1862 Research

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

Change in Knowledge Outcome Measure

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

<b>Year</b>	<b>Actual</b>
2014	5102

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

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

Providing ample alternatives for sustainable energy is critical to Kentucky communities. One primary way is to make improvements in and around homes to increase the efficiency of energy use and other valuable resources. Extension is faced with the issues of effectively collecting energy from renewable resources.

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

KSU Extension specialist for Sustainable Programs worked with the Director of the Family Resource Center at Winburn Elementary School in Lexington, KY, as well as with a Family and Consumer Sciences Agent in Fayette County. The team developed a five-week Sustainable Moms Series. Topics covered included: eating sustainably on a budget (looking for fresh, organic products when they are at lowest prices), green cleaning and living, sustainable meal planning, how to have a sustainable holiday season (purchases that are economical and beneficial for the environment), creating gifts and decorations from repurposed materials

University of Kentucky Extension Agents from four districts partnered with a University of Kentucky Extension Specialist along with local farmers to plant and harvest 26 corn silage varieties on 3 farms across Kentucky. Performance data was collected to assess any increase in the quality and yield of milk.

Extension offered workshops to producers on high tunnel vegetable profitability.

#### **Results**

The KSU Sustainable Moms program consisted of 12 individuals of Hispanic descent. The participants provided feedback on how they benefited from the program. Answers ranged from

having saved money on recent shopping purchases while focusing more on having fresh produce in their grocery carts, to turning down thermostats in their homes and having family members wear sweaters around the house.

The results from the corn silage project were printed as the official UK Corn Silage Hybrid Performance Test publication of the University of Kentucky Cooperative Extension Service. Farmers from Kentucky and across the United States are using this information to select corn silage varieties for increased milk production.

Sixty percent of participants rated the high tunnel vegetable conference workshops as significant for their operations and 12 percent rated it very significant. Eighty-nine percent said they learned a lot from the information presented.

**4. Associated Knowledge Areas**

KA Code	Knowledge Area
131	Alternative Uses of Land
402	Engineering Systems and Equipment

**Outcome #2**

**1. Outcome Measures**

Number of individuals who incorporated practices suggested by Extension that promote sustainable energy (i.e., applied water conservation policies, participating in energy audits, installed energy efficient equipment, etc.)

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

Year	Actual
2014	3857

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

**Issue (Who cares and Why)**

The agricultural economy of Eastern Kentucky since the tobacco buyout has depended on livestock and forage production. However, more information is needed to increase profitability of farm operations.

**What has been done**

Morgan, Wolfe, Menifee, Whitley and Elliott counties teamed with UK Extension specialists and the Master Grazer Program to offer a one day grazing school for 38 attendees. Located at the Morgan County Extension Farm, the field day covered topics on why rotational grazing and no-till can help sustain the land, how to build permanent and temporary fences, constructing portable water systems, what and how to seed pastures, basics and benefits of clovers, laying out your grazing plan, understanding soil sample results, plus knowing and treating your pasture weeds.

**Results**

Farmers commended the Master Grazer program for its hands on approach, classroom demonstrations, visual demonstrations and practical information. As a result, 62% of the surveyed producers indicated adopting rotational grazing instead of continuous grazing; 62% also stated they would use temporary fencing to create more grazing paddocks; 95% gained knowledge on the importance of soil testing; and, 71% gained confidence to design a watering system to provide ready access to any paddock.

In one county, 100 percent of the farms have received Restricted Use Pesticide Certification and 5,300 acres of row crops (95%) are now grown as No-till.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
131	Alternative Uses of Land
402	Engineering Systems and Equipment

**Outcome #3**

**1. Outcome Measures**

Number of producers who reported an increase in their production of bioenergy crops (corn, soybeans, switchgrass, etc.)

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Condition Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2014	1322

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



**Issue (Who cares and Why)**

As seed companies continue to release more technology through corn and soybean hybrids, unbiased, local, research based, variety trials that showcase how these new hybrids perform under Kentucky growing conditions and management have become increasingly important.

**What has been done**

The Hardin County Cooperative Extension Service, in cooperation with the Hardin County Grain Committee, continue to carry out the Hardin County Corn and Soybean Variety Trials. A field day was held, and 68 producers from Hardin and surrounding counties were on hand to see a visible comparison between 31 different corn varieties from 11 different companies, and 42 different Roundup Ready and Liberty Link soybean varieties from 10 companies.

University of Kentucky Extension Agents from four districts partnered with a University of Kentucky Extension Specialist along with local farmers to plant and harvest 26 corn silage varieties on 3 farms across Kentucky.

Area Grain Producer meetings for 5 counties were held in Boyle County, with 81 producers attending to learn from U.K. specialists and agents about corn, small grains and soybean production and to promote soil sampling vigorously as an important management practice.

**Results**

Producers that attended these events have added grass waterways back to eroding areas, and additional acres are using no-till methods for grain production.

The Bracken County Extension Service has planted a cover crop demonstration to showcase different options of cover crops, their benefits, and growth habits. This will be highlighted at summer and fall workshops.

A producer in one County, experienced a difference in savings of \$47.14 an acre which meant that he saved \$942.80 on 20 acres of corn after learning more about the importance of soil testing.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
131	Alternative Uses of Land

**Outcome #4**

**1. Outcome Measures**

Number of youth reporting an increase in knowledge of energy conservation practices

**2. Associated Institution Types**

- 1862 Extension

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2014	13480

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

**Issue (Who cares and Why)**

Many of today's youth are not in touch with the environment and the need to sustain our natural resources. Extension has the potential to contribute to the education of youth in this area.

**What has been done**

Clay County Extension implemented a Forestry Field Day to give youth an opportunity to observe wildlife, engage in tree measurement and assist in cleaning up waterways.

Bullitt County Extension worked with youth to help improve the landscaping around the high school and built a compost bin for use in the school greenhouse.

A total of 31 youth from Daviess County participated in a farm field day. Results of a written survey given immediately following the event indicated that 95% of the youth learned something new about agriculture and 74% thought that agriculture was more important after participating in the farm tour.

KSU Extension offered workshops during Earth Day for over 600 Jefferson County youth.

**Results**

Clay County Youth learned how to better protect their environment, understand the value of renewable and non-renewable resources, and the importance of forests in an ecosystem. All of the teachers were very pleased to see that the information the students learned reinforced classroom lessons and gave them real, hands on experience.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
131	Alternative Uses of Land
402	Engineering Systems and Equipment

## **Outcome #5**

### **1. Outcome Measures**

Expanding available lignocellulose-degrading enzymes for bio-based energy and industrial applications

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

- 1862 Research

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

Change in Knowledge Outcome Measure

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

<b>Year</b>	<b>Actual</b>
2014	0

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

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

The use of renewable lignocellulosic biomass including byproducts from agriculture and forestry for the production of biofuels and other products is a vital alternative to fossil-based energy and chemical resources. However, a number of obstacles, such as the thermo-chemical conversion of biomass, must be overcome prior to achieving a sustainable production of biofuels. This situation would be greatly improved if we understood more about wood-feeding insects, the best examples of highly efficient enzymatic lignocellulose digestive systems extant in nature. Wood-feeding Dictyopterans including termites and woodroaches are, by far the most efficient lignocellulose-processing bioreactors on this planet, uniquely capable of breaking down seemingly recalcitrant lignocelluloses efficiently and rapidly. Although our pressing need for bioenergy and biomass conversion has redirected termite research to focus more on lignocellulose digestion and degradation, there is virtually no information available on the wood-feeding cockroach, *Cryptocercus*, the evolutionary ancestor of termites. Rather than picking and choosing a few representatives from over 2,700 termite species, which may or may not be informative, dissecting the genomic information from the evolutionary ancestor for all termite species provides an all-important reference point for understanding the elusive lignocellulose digestion machinery within the wood-feeding Dictyopterans.

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

A genomics and metagenomics-mediated approach was employed to better understand the framework of lignocellulose digestion machinery and digestive contributions of host and symbiont in the wood-feeding cockroach, *C. punctulatus*. Two independent sequencing efforts have been carried out for the duration of the project: 1) tissue-specific transcriptome sequencing of the entire digestive tract, including salivary gland, foregut, midgut, and hindgut, respectively; and 2) metatranscriptome sequencing of *C. punctulatus* hindgut, including pro- and eukaryotic symbionts. Comparative genomics analysis identified a list of lignocellulases highly conserved among the wood-feeding Dictyopterans. Of those found, we characterized a group of endogenous

genes from woodroach salivary gland, including two endoglucanases and two laccases.

### Results

The initial characterization study shows that both enzymes can act synergistically in the degradation of natural woody materials, and is likely the core enzymes within the lignocellulose digestion machinery among wood-feeding Dictyoptera. Moreover, woodroach laccases can efficiently biodegrade the reactive dye, Remazol Brilliant Blue R (RBBR), which has potential for diverse industrial applications, e.g., textile industry. Highly active and chemical/thermal stable lignocellulolytic biocatalysts are a major bottleneck for the large-scale production of biofuels from lignocellulosic biomass. This research provides a list of core enzymes fundamentally important to the degradation of woody materials, suggesting the potential applications in the biomass conversion of agricultural and forestry byproducts, as well as other industrial needs.

## 4. Associated Knowledge Areas

KA Code	Knowledge Area
402	Engineering Systems and Equipment

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

#### External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Government Regulations
- Competing Programmatic Challenges

#### Brief Explanation

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

#### Evaluation Results

Increased awareness, change in practices

#### Key Items of Evaluation

Surveys, observations

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

**Program # 10**

**1. Name of the Planned Program**

Childhood Obesity

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
703	Nutrition Education and Behavior	59%	85%	0%	100%
704	Nutrition and Hunger in the Population	0%	4%	0%	0%
724	Healthy Lifestyle	41%	11%	100%	0%
<b>Total</b>		100%	100%	100%	100%

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

1. Actual amount of FTE/SYs expended this Program

Year: 2014	Extension		Research	
	1862	1890	1862	1890
<b>Plan</b>	30.0	1.0	0.5	0.5
<b>Actual Paid</b>	16.0	3.6	0.1	0.1
<b>Actual Volunteer</b>	12233.0	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
252965	26645	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
279917	11419	3630	874
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	103637	0	0

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

1. Brief description of the Activity

2014 University of Kentucky and Kentucky State University Combined Research and Extension Annual Report of Accomplishments and Results

- conducting educational programs for children
- training extension agents
- developing educational materials
- conducting programs with parents
- evaluating the impact of the Expanded Food and Nutrition Education Program

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

- children
- youth
- extension agents
- teachers
- parents

**3. How was eXtension used?**

Specialists collaborating with colleagues (communities of practice), hosting and participating in webinars

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

**1. Standard output measures**

2014	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Actual</b>	143259	538449	172755	584990

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

**Patent Applications Submitted**

Year: 2014  
Actual: 0

**Patents listed**

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

**Number of Peer Reviewed Publications**

2014	Extension	Research	Total
<b>Actual</b>	3	1	4

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

**Output Target**

**Output #1**

**Output Measure**

- Published research journal articles.

<b>Year</b>	<b>Actual</b>
2014	0

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

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

O. No.	OUTCOME NAME
1	Total number of children and youth reached through Extension programming related to eating healthy foods
2	Total number of children and youth who gained knowledge about eating more healthy foods
3	Total number of children and youth who reported eating more healthy foods
4	Number of environmental changes implemented to support physical activity (e.g., walking trails opened, bike paths built)



## **Outcome #1**

### **1. Outcome Measures**

Total number of children and youth reached through Extension programming related to eating healthy foods

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

- 1862 Extension
- 1890 Extension

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

Change in Knowledge Outcome Measure

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

<b>Year</b>	<b>Actual</b>
2014	165496

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

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

Kentucky has the second highest rate of childhood obesity in the country. There is a need to mobilize underserved children and youth and empower them to take action around nutrition, healthy food choices, and physical activity. More partnerships need to be established between Extension and other organizations strategically situated to reach these communities.

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

Kentucky State University Cooperative Extension Program worked collaboratively with Early Childhood Programs in Louisville, Kentucky and the Lexington Police Activities League (PAL) in Lexington, Kentucky to address childhood obesity.

Jefferson County (Louisville, KY) Cooperative Extension agents and program assistants completed 1,127 Snap-Education hours, reaching 7,908 people with nutrition education through various delivery sites such as pre-schools, schools and senior citizen centers.

Kentucky Extension offered the Literacy Eating and Activity for Preschool (LEAP) program.

#### **Results**

Over 300 students and their families were targeted through their Early Head Start, Preschool and Head Start Programs. Staff worked with the local Health Clinic to promote healthy eating and fitness through the Louisville Training Center On the Go program. Over the course of 12 weeks, students received information about healthy eating and engaged weekly in physical activities. In Lexington, approximately 200 youth were engaged on a regular basis in some type of physical activity and/or organized sport.

Over 56,000 youth participated in the LEAP program.

#### 4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior
724	Healthy Lifestyle

#### Outcome #2

##### 1. Outcome Measures

Total number of children and youth who gained knowledge about eating more healthy foods

##### 2. Associated Institution Types

- 1862 Extension
- 1890 Extension

##### 3a. Outcome Type:

Change in Knowledge Outcome Measure

##### 3b. Quantitative Outcome

Year	Actual
2014	132871

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

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

Childhood obesity continues to be a serious health concern in America among preschool youth (ages 2-5) Obesity continues to rise. Kentucky ranks consistently in the top ten states for obesity and obesity related diseases such as diabetes and cardiovascular disease. The risk factors of poor nutrition and physical inactivity is a direct correlation with cardiovascular disease and begins early in life.

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

Kentucky State University worked with the afterschool coordinators in Lexington to promote the Healthy Enhancement Life Skills/Let's Move Program. An array of workshops and activities that were provided weekly focused on: physical fitness, healthy eating, community gardening, cooking, sports/physical fitness, self-esteem and youth and leadership development.

The Campbell County Cooperative Extension Service collaborated with community partners on an 8-session program for 65 children.

Woodford County Cooperative Extension Service assisted in providing nutrition education to

students through afterschool programming.

### Results

As a result of KSUs Youth Voice: Youth Choice collaboration, approximately 100 youth have been educated about healthy eating and the importance of physical fitness. In a similar program, for approximately 10 weeks, youth participated in learning activities to demonstrate how they can play a vital role in their community's access to healthy food and help raise awareness about obesity and the physical fitness of their community.

At the end of the Campbell County program, 97% of the children could identify spinach as a vegetable, 100% could identify blueberries as a fruit, 100% knew that exercising and being physically active was important.

Youth in Woodford County reported taking the skills they learned in the after school lessons to prepare foods at home. Many youth reported that this was the first time they had ever prepared meals using fresh food.

## 4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior
724	Healthy Lifestyle

### Outcome #3

#### 1. Outcome Measures

Total number of children and youth who reported eating more healthy foods

#### 2. Associated Institution Types

- 1862 Extension
- 1890 Extension
- 1862 Research

#### 3a. Outcome Type:

Change in Action Outcome Measure

#### 3b. Quantitative Outcome

Year	Actual
2014	65372

### 3c. Qualitative Outcome or Impact Statement

#### Issue (Who cares and Why)

According to the Kentucky Cabinet for Health and Family Services Report, there were 135,171 Supplemental Nutrition Assistance Program (SNAP) recipients in Jefferson County. There is also a gap between providing access to nutritious foods and the lack of education about how to prepare healthier foods.

#### What has been done

Extension has offered programs that promote healthy eating/living in several counties. The Campbell County Extension Service teamed up with the Dayton Family Resource Center to coach Girls on the Run to 8 middle school girls. Girls on the Run is a 12 week program that focuses on physical activity, nutrition, and self-esteem. The Campbell County Cooperative Extension Service also collaborated with Basic Trust Childcare Center Preschool, Campbell Ridge Preschool, and Main Street Baptist Church Preschool on an 8-session curriculum called Leap (Literacy, Eating, and Activity for Preschoolers) for Health to 65 children.

Oldham County and Owsley County Extension Services hosted Kids Cooking camps.

#### Results

The Campbell County Extension Service also collaborated with the Dayton Family Resource Coordinator on a four part series healthy cooking class (taught twice) for 11 middle/high students. The students were taught proper food safety, nutrition, and cooking skills. At the end of the series, participants received a "Living Well-More than a Cookbook" resource guide. End of the program results showed that 73% were making healthier food choices, 73% had tried a new food item in class, 83% said their knife skills improved, and 83% said they became more comfortable using and making a recipe.

Of the 25 participants in Oldham County, an exit survey indicated initial results that showed 86% of the youth could demonstrate proper measuring techniques and 90% understood the MyPlate recommendations. Intermediate outcomes revealed 86% of youth understood the importance of safe food handling practices, especially the handling of poultry products.

### 4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior
724	Healthy Lifestyle

#### Outcome #4

##### 1. Outcome Measures

Number of environmental changes implemented to support physical activity (e.g., walking trails opened, bike paths built)

##### 2. Associated Institution Types

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Actual
2014	0

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

**Issue (Who cares and Why)**

Appropriate food intake and an active lifestyle are required to maintain health. Healthy habits developed as children translate into healthy habits as adults. Kentucky youth are in need of additional opportunities that encourage health and wellness.

**What has been done**

Kenton County Extension presented a program on healthy eating and physical activity called Get Fit with 4-H to 260 youth in 4-H school clubs and after-school programs.

McCreary County Extension offered a hiking program, with a total of 9 hikes for a total of 32 miles with an average of 25 students per hike.

**Results**

Of the Kenton County youth reporting, 80% claim to have increased their physical activity as a result of the 4-H program.

Of the McCreary County participants reporting, 100% reported they made some new friends through the program , 100% reported that they learned hiking skills , 96% reported that hiking made them feel better about themselves, 92% felt that the hiking program had improved their body and physical condition , 92% reported that they feel healthier since being in the hiking program , 92% reported that they had increased their daily physical activity, and 88% felt like they are in better physical condition since participating in the program.

**4. Associated Knowledge Areas**

KA Code	Knowledge Area
724	Healthy Lifestyle

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

**External factors which affected outcomes**

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Government Regulations
- Competing Programmatic Challenges

**Brief Explanation**

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

**Evaluation Results**

Knowledge gained, skills developed, practice/behavior change

**Key Items of Evaluation**

Pre-post surveys, focus group discussions, observations.

## VI. National Outcomes and Indicators

### 1. NIFA Selected Outcomes and Indicators

<b>Childhood Obesity (Outcome 1, Indicator 1.c)</b>	
0	Number of children and youth who reported eating more of healthy foods.
<b>Climate Change (Outcome 1, Indicator 4)</b>	
0	Number of new crop varieties, animal breeds, and genotypes with climate adaptive traits.
<b>Global Food Security and Hunger (Outcome 1, Indicator 4.a)</b>	
0	Number of participants adopting best practices and technologies resulting in increased yield, reduced inputs, increased efficiency, increased economic return, and/or conservation of resources.
<b>Global Food Security and Hunger (Outcome 2, Indicator 1)</b>	
0	Number of new or improved innovations developed for food enterprises.
<b>Food Safety (Outcome 1, Indicator 1)</b>	
0	Number of viable technologies developed or modified for the detection and
<b>Sustainable Energy (Outcome 3, Indicator 2)</b>	
0	Number of farmers who adopted a dedicated bioenergy crop
<b>Sustainable Energy (Outcome 3, Indicator 4)</b>	
0	Tons of feedstocks delivered.