

# 2017 Fort Valley State University and University of Georgia Combined Research and Extension Annual Report of Accomplishments and Results

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## I. Report Overview

### 1. Executive Summary

This executive summary provides background information about Georgia and the state's Federal Report of Accomplishments. This summary provides data on the state and its universities, program highlights, examples of collaborative efforts between the University of Georgia (UGA) and Fort Valley State University (FVSU), and brief summaries of each of the eight planned programs.

#### BACKGROUND

FVSU and UGA address major agricultural issues and other problems that affect rural and urban areas, the environment, families, and youth. This accomplishment report presents coordinated efforts between the state's 1862 and 1890 land-grant institutions, UGA and FVSU, respectively, and covers the joint planning that occurs between agricultural experiment stations and Cooperative Extension units at both universities.

Georgia started as one of the country's original 13 colonies. The state has a land area of 59,425 square miles; it's the largest state east of the Mississippi River and the 24<sup>th</sup>-largest state in the country. Five major physiographic regions comprise Georgia: the Blue Ridge Mountains in the northeast; the Ridge and Valley Province and the Cumberland Plateau in the northwest; the Piedmont across central Georgia; and the Coastal Plain in the south. Elevations range from sea level to 4,784 feet at Brasstown Bald, located in the Blue Ridge Mountains.

In 2017, the U.S. Census Bureau estimated Georgia's population was 10,429,379. Of that, 24.4 percent were estimated to be under age 18, and 13.1 percent were 65 or older. According to the census, 61.2 percent of Georgians identified themselves as white, 32 percent identified as African-American and 9.4 percent identified as Hispanic or Latino.

There are 168 Cooperative Extension offices in 158 of Georgia's 159 counties. FVSU and UGA county personnel are jointly housed in county offices. Extension personnel deliver programming in the areas of Agriculture and Natural Resources, Family and Consumer Sciences, and 4-H Youth Development through individual county efforts and multicounty programming. State faculty members provide training to county agents. They also deliver programming directly to clientele, when it's appropriate.

FVSU and UGA researchers and scientists conduct research programs through a system of agricultural experiment stations. There are several campuses throughout the state, but the four largest are located in Athens, Fort Valley, Tifton and Griffin, Georgia. In addition, Georgia research and education centers are located throughout the state.

Core programs and targeted issues are determined and guided by a structured program-development system, and they are the focus of this joint report. The program-development system is a multistep process that remains in operation throughout the year. It enables needs assessment, problem identification and program evaluation, which is used to determine impact. The Georgia program-

development model works in cooperation with multiple advisory systems at county and state levels.

Georgia's Federal Report of Accomplishments does not capture all of the work of the colleges' faculty members. Instead, it is intended to document the accomplishments of faculty members who receive specific formula funds. Core programs cover traditional animal and plant production, family and consumer skills, the emerging issue of biofuels, and more. The goal of these programs is to demonstrate short- and long-term impacts. The greatest impacts of these core programs are the foundations they create to support and leverage additional resources beyond state matching funds.

## PLANNED PROGRAMS

A variety of projects through the **Animal Production** and **Plant Production** programs addressed global food security and hunger. These programs, along with **Urban Agriculture** programs, responded to the growing issues of climate change and natural resource conservation.

In an effort to reverse the trend of childhood obesity, faculty working in the **Health and Nutrition** and the **Youth and Family Development** programs provided much-needed research and education to encourage healthy eating habits and physical activity in children.

**Sustainability, Conservation and the Environment** programs encompassed a variety of interdisciplinary research projects to develop the new knowledge and technologies needed to address the effects of climate variability and change. Research projects also focused on the development and enhancement of sustainable biofuels in order to provide domestic sources of sustainable energy.

Faculty in **Food Safety** programs increased and improved the number of viable technologies and educational opportunities for the detection, characterization and prevention of foodborne threats.

The **Home and Life Skills** programs worked on improving home health and homeownership. This program also covered financial planning, consumer awareness, indoor air quality and general well-being.

## HIGHLIGHTS

### Animal Production

In cattle, heat stress remains a significant issue in limiting dairy cattle's production. Efforts have been made to seek solutions that minimize the impact of heat stress on dairy cattle and to educate producers about potential solutions involving heat abatement and management.

The Georgia Master Cattleman Program is a joint educational effort of various departments in UGA's College of Agricultural and Environmental Sciences (CAES) and College of Veterinary Medicine. The program consists of eight educational sessions that each span two hours. The course provides a thorough overview of the beef industry and covers best management practices for beef cattle production. Course topics include nutrition management, forage management, beef cattle economics, external parasites, farm fences and buildings, record keeping, animal health management, biosecurity, reproductive management, and beef cattle selection/genetics.

Researchers assisted in the development of a new system for farmers to access information on their mobile devices to help maintain their animals' health and to grow their crops.

Specialists educated and trained small goat farmers in Guatemala on producing quality goat's milk and

establishing a dairy goat industry for economic survival.

Research was also conducted to develop genetic models that use all sources of information, including phenotypic, pedigree and genomic data, to compute genetic values. The research also resulted in software with access to phenotypic, pedigree and genomic information that can be used to conduct genetic evaluations for livestock populations.

## **Food Safety**

Foodborne diseases affect millions of American each year. The Centers for Disease Control and Prevention (CDC) estimates that roughly 1 out of 6 Americans -- 48 million people -- gets sick; 128,000 are hospitalized; and 3,000 die from foodborne diseases annually. The U.S. Department of Agriculture (USDA) Economic Research Service (ERS) estimates costs related foodborne illness at \$6.9 billion per year, based on five foodborne illnesses alone. Of all 10 sites monitored by CDC's FoodNet system, Georgia has had the highest incidence of salmonellosis in recent years. Infants, young children, the elderly and those with weakened immune systems are the most at-risk populations for serious complications, which may include kidney failure, seizures, strokes, heart complications and death.

Easily accessible, local trainings for child care providers, school employees and restaurant workers are in demand. Employee turnover rates in the food service industry are very high, and the need for education is continual. Georgia Cooperative Extension offers research-based information through trainings across the state.

Family and Consumer Sciences specialists and agents collaborate with state and county public health departments; the Georgia Department of Education School Nutrition Program; the Georgia Department of Education Career, Technical, and Agricultural Education program (CTAE); Georgia Department of Agriculture; Georgia Farmers Market Association; Georgia Fruit and Vegetable Growers Association; the Produce Safety Alliance; the Georgia Master Gardener Extension Volunteer program; and other state Extension services.

## **Health and Nutrition**

Two-thirds of adults are overweight or obese. Obesity contributes to the development of many chronic diseases including diabetes, hypertension, cardiovascular disease and cancer. Three-quarters of Georgians are inactive, a condition that also contributes to these chronic diseases. Twenty percent of Georgia's children are overweight or at risk of becoming overweight.

In the U.S., 20.8 million people have diabetes, and 41 million have prediabetes. In Georgia, nearly 7 percent of the population has diabetes, the sixth-leading cause of death in the state. Both diabetes and prediabetes create risks for cardiovascular disease. People of African, Asian, Latino and Hispanic descent are two to four times more likely than people of Caucasian descent to develop diabetes. The economic impact of diabetes may be close to \$4 billion per year.

Dietary choices affect the development of an estimated 20 to 40 percent of cancers. The risk for getting many different cancers can be reduced by eating more fruits, vegetables and whole grains; drinking more fluids; consuming more nonfat and low-fat dairy foods; and being more physically active.

Georgia 4-H Youth Development and Family and Consumer Sciences programs teach health habits, nutrition and the importance of physical activity to Georgia's adults and children.

Georgia 4-H received the Walmart Healthy Habits grant that focuses on healthy nutrition, exercise and

hunger prevention. Twenty-eight Georgia counties currently participate in the grant, which will reach 4,828 youths in 2017 and at least 5,000 youths in 2018. Additionally, four metro Atlanta counties participate in Target's Wellness 360° program, which focuses on healthy nutrition and exercise in urban settings and will reach 1,200 youths and families.

Georgia 4-H's Health Rocks! program continues to reach youth with timely education about preventing alcohol use, smoking, over-the-counter and prescription drug abuse, and opioid use. In Georgia, the program reached 17,733 youths in 2017. Prevention of both bullying and cyberbullying continue to be important educational topics for Georgia 4-H youth. Georgia 4-H has prioritized the use and education of volunteers in an effort to share healthy living information with more youth audiences. The creation of leader certifications in foods and nutrition projects and the 4-H Yoga for Kids program has extended the capacity for youth to gain life skills and grow in these areas.

### **Home and Life Skills**

The increasingly sophisticated financial marketplace, dramatic shift from defined-benefit to defined-contribution retirement plans, and longer life spans make it vitally important for Georgia families to understand and implement sound financial management skills and practices.

Financial skills and practices can be learned. Improving financial literacy enhances the economic well-being of Georgia families. The earlier that sound financial skills and practices are learned, the greater the potential economic impact over the life span.

The goal of financial literacy programs is to improve personal financial management skills, practices and knowledge to enhance the economic well-being of Georgia families. This goal is accomplished by training Extension agents to deliver the best research-based information.

Indoor contaminants including, but not limited to, radon, environmental tobacco smoke, biological contaminants, combustion by-products, household products, volatile organic compounds, pesticides, asbestos and lead cause indoor air quality (IAQ) problems. The health effects of these contaminants range from allergic reactions in sensitive populations to death.

Additionally, the health effects of some IAQ contaminants are unknown at this time. Extension specialists train agents to provide IAQ programming to target populations and to teach consumers how to reduce exposure to IAQ contaminants in home, work and school environments. Specialists also develop curricula, print and online consumer resources, and program evaluations.

Specialists worked in partnership with the Georgia Healthy Homes Coalition to coordinate a healthy homes booth at the Georgia National Fair in 2017.

### **Plant Production**

#### **Fruit**

Researchers develop the biological basis for enhanced disease management in Southeastern fruit production, emphasizing diseases that affect peaches and blueberries, the two most economically important fruit crops in Georgia. They focus on increasing the understanding of the biology and epidemiology of emerging pathogens (e.g., bacterial spot of peach) and of existing pathogens that are difficult to control (e.g., mummy berry in organic blueberries).

Fruit crops grown in the Southeast experience heavy insect pressure, and as such, insect pest management is an important component of commercial peach production. Applied research and

subsequent educational and demonstrative activities are necessary to develop and implement novel integrated pest management (IPM) programs.

Researchers collaborated with fruit pathologists and Extension agents from UGA and South Carolina's Clemson University to collect data and disseminate information to growers.

### **Pecans**

Georgia leads the nation in pecan production, with over 142,500 acres planted to pecans. Pecans typically rank in the top twenty commodities for Georgia agriculture in the area of farm gate value.

Pecans are a perennial crop with a long growing season. Pecan growers maintain orchards and produce crops in the same place year after year, for decades. Farmers must protect trees and nuts for 6 months or more and maintain tree health year around. Efforts to improve food safety, worker protection and environmental stewardship add to the challenge.

### **Vegetables**

Vegetable production in Georgia is an important agricultural activity, particularly in the southern part of the state. Georgia ranks third in vegetable acreage (250,000 acres) and fourth in value (\$631 million) in terms of vegetable production as compared to other states.

Environmental factors such as high temperatures during the summer may be detrimental to the yield and quality of vegetable crops in Georgia. Tomato, tomatillo and onion results suggest that a better understanding of the effects of environmental factors such as root zone temperatures on vegetable crops will help us better predict crop responses. They will also allow us to more effectively use plasticulture techniques to increase productivity and produce quality and reduce the impact of extreme weather conditions.

A number of diseases severely impact the profitable, sustainable production of vegetables in Georgia. Phytophthora blight, southern blight, fusarium wilt, gummy stem blight and downy mildew are the most destructive and difficult to control. One project is dedicated to developing effective, environmentally sound strategies to manage major vegetable diseases, which will provide growers with useful tools to reduce losses caused by the diseases and help maintain a safe food supply.

Insect pest management programs for vegetables help growers manage insect and mite pests of a wide variety of vegetables -- onions, cole crops, sweet corn, cucurbit crops -- while minimizing potential adverse effects.

### **Row crops**

Cotton, peanut and soybean production is limited each year when diseases and nematodes attack. Many consider parasitic nematodes to be one of the most undermanaged pests of cotton in Georgia, and they cost growers tens of millions of dollars each year. Asian soybean rust is a priority for the U.S. soybean industry at this time, and Georgia is one of the battleground states in terms of its management. Developing management strategies for this disease and collecting information for larger soybean-producing states is a critical component of this program.

Researchers continued to develop effective, affordable management strategies for Asian soybean rust; effective management strategies for control of nematodes in cotton based upon estimates of the population of the nematodes in the soil; and the Peanut Disease Risk Index, which enables growers to maximize the benefits of a disease control program and minimize the cost.

## **Peaches**

The UGA peach entomology program researchers, in collaboration with UGA and Clemson University peach pathologists, developed recommendations to guide growers through tough peach production decisions in 2017. Additionally, trials were conducted in collaboration with Extension agents and peach growers to gain insight into better management programs for insect pests in Georgia.

Management guides and the MyIPM smartphone app were updated for the 2018 season.

## **Blueberries**

Blueberries are a major fruit crop in the Southeast. There are over 28,000 acres under production in Georgia alone. Blueberries, namely the rabbiteye and southern highbush varieties, are quickly becoming a fruit crop of great economic value in Georgia.

Long-term, sustained profitability of this crop will greatly depend on improved production efficiency. Harvesting is a highly labor-intensive process. It constitutes a major production expense for blueberry growers because a majority of the blueberry crop in Georgia is harvested manually. Mechanical harvesting has the potential to cut harvesting costs, but the process is currently inefficient and results in fruit injury, fruit loss (greater than 25 percent) and reduced fruit quality.

Improvement in the efficiency of mechanical harvesting is highly desirable as it would make blueberries more profitable.

## **Crop and weed management**

The crop and weed management program has been designed to provide leadership, technical guidance and support, research, and information on agronomic commodities, weed management techniques and forages of interest, both locally and nationally, to county Extension agents, growers, students, consultants, industry representatives and other clientele.

Increased globalization has expanded producers' and agronomic commodity and forages end users' needs for up-to-date technical information and expertise. They need this information to remain economically viable and sustainable. In addition, individuals must be trained to provide, assist, operate and create this information. This program's priority is to provide the necessary information and technical expertise to meet this challenge. Priorities within this program have been set by local needs assessments and professional knowledge.

This crop and weed management program aims to improve knowledge and implement practices in order for growers to maintain economically viable production of agronomic crops and forages in Georgia while sustaining a healthy environment.

## **Biotechnology**

Research revealed critical heat coping strategies in the pearl millet genome sequence for sustainable crop production and food security.

Researchers studied stevia to establish a sustainable processing plant in the U.S. and to enhance farmers' income.

## **Sustainability, Conservation and the Environment**

The environmental sciences program is designed to provide leadership for research, teaching

and extension activities related to the inventory, management, protection and enhancement of natural resources that the human civilization relies on for food, clean water and clean air.

Greenhouse gas emissions from animal agriculture have been a growing concern. The poultry industry has made a move to monitor and abate greenhouse gas emissions. This program assists the poultry industry in reducing greenhouse gas emissions from poultry houses.

Increased population growth and changing production patterns in agriculture have resulted in the degradation of soil, air and water in some areas. Concerns about the management and control of natural resources and sustainable agricultural systems have come to the forefront, especially in increasing numbers of areas where the urban-rural interface is most intense. These concerns led to the need for analyses of legislative and regulatory choices that address environmental problems and incorporate economic efficiency criteria. Public pressure for information about the value of nonmarket goods, such as environmental amenities, and the costs and benefits of government regulations has increased.

Researchers observe and qualitatively assess the impact of their research on the conservation of Georgia's natural resources and environmental quality.

In terms of agricultural economic development, researchers assist local entrepreneurs and governments and work on problems and issues related to expanding employment opportunities and the developing and mobilizing social and human capital.

For Georgia's agribusinesses, researchers also conduct economic and market analyses of major factors and issues that affect the performance of U.S. and international food and agribusiness industries and that contribute to its sustainability and prosperity.

### **Urban Agriculture**

The Georgia Center for Urban Agriculture provides an organizational structure designed to facilitate scientific crossfertilization among investigators, agents, industry representatives and homeowners. It facilitates issue identification. The center offers continuing education programs that are relevant to the urban environment. The center strives to improve UGA's federal research-funding opportunities by creating a more readily recognizable organizational structure at this institution. It opens UGA to opportunities beyond those available to individual investigators. The center is a natural catalyst for large grant proposals involving multiple investigators who seek funding for infrastructure, training and interinstitutional collaboration. The center supports efforts at UGA and within the state to strategically target funding for projects that reflect the core interests of the center.

Urbanization impacts the physical environment in unique and complex ways. It directly changes forest ecosystems by fragmenting or removing forest cover. It impacts other ecosystems by modifying hydrology, altering nutrient cycling, introducing non-native species, modifying disturbance regimes and changing atmospheric conditions. These physical changes affect land-use management, water resource management, stormwater management, soil erosion and sediment control, waste management, forestry resource management, urban forestry, and greenspace preservation in complex ways.

This complexity of the urban ecosystem is further complicated by competing human interests and increasing demands on natural resources.

CAES has scientific expertise in all of these areas, experience and an effective system to deliver this expertise to the public (Cooperative Extension).

Understanding the benefits of plants and gardening, Georgia residents seek to grow fruits, vegetables and

ornamental plants. They look to Extension for advice and direction. To meet local needs for horticulture and gardening information and education, Extension agents recruit and train individuals as Master Gardener Extension Volunteers (MGEVs). These volunteers then provide services to the public by answering gardening questions, conducting workshops, giving presentations and demonstrating techniques at garden sites throughout the state. As a result of educational activities offered by MGEVs, Georgians make environmentally sound gardening decisions.

The MGEV program in Georgia is a volunteer training program designed to help UGA Extension staff transfer research-based information about gardening and related subjects to the public by training home gardeners to be volunteer educators. Through active MGEV programs in many Georgia counties, UGA Extension is able to reach out and serve more citizens through educational programming and demonstrations.

MGEVs ultimately help Extension achieve its mission of helping Georgians become healthier, more productive, financially independent and environmentally responsible.

There are approximately 1.9 million acres of turfgrass in Georgia with a maintenance value of \$1.85 billion. Disease losses and control costs account for over \$300 million annually. Due to the increase, use and popularity of turfgrass species, as well as their high aesthetic value, disease losses and control costs are enormous. Additionally, golf course superintendents, sod producers and commercial landscape managers use fungicides as their primary disease-control strategy. Furthermore, a considerable number of homeowners rely on pesticides to control turfgrass diseases. Turfgrass fungicides are cost-prohibitive, their overuse can be detrimental to the environment, and fungicide resistance is becoming an important issue in Georgia. There is a significant need to develop integrated strategies for disease management as well as to educate turfgrass producers, turfgrass professionals, landscape company personnel, county faculty and the general public on disease etiology, epidemiology, and sound and effective disease management strategies for turfgrass.

### **Youth and Family Development**

Four-H programs are available through local 4-H clubs, 4-H camps, in-school and after-school programs. With the support of adult mentors, youth select from a menu of hands-on project ideas to complete. Four-H programs are available for children ages 8 to 18, and 4-H Cloverbud programs are available for children ages 5 to 7.

Georgia 4-H has programming throughout the state, with specialized educational facilities: Burton 4-H Center on Tybee Island, Fortson 4-H Center in Hampton, Camp Jekyll and 4-H Tidelands Nature Center on Jekyll Island, Rock Eagle 4-H Center in Eatonton, and Wahsega 4-H Center in Dahlonega. Core programs include:

- 4-H county and club meetings, which provide hands-on projects for kids in a positive environment where they receive guidance from adult mentors
- 4-H Environmental Education, which provides hands-on learning in Georgia's outdoor classroom
- 4-H Livestock Program in which 4-H'ers learn responsibility by raising and showing livestock
- 4-H Project Achievement, which serves to showcase 4-H'ers' work and success
- 4-H summer camp, which provides adventure, friendship and fun for ages 9 and up

### **Science, engineering and technology**

At issue is the importance of creating environmentally literate citizens and use of the outdoors as an extension of the classroom. Many of today's youth are denied the opportunity to learn outside and develop an appreciation of the outdoors.



Camp Jekyll, Rock Eagle 4-H Center, Wahsega 4-H Center, Burton 4-H Center, Tideland Nature Center and Fortson 4-H Center give children this opportunity.

This issue exists for society in general, but this program seeks to educate youth. The lack of environmental stewardship will result in a public poorly informed about our natural heritage, which will lead to destruction of this heritage, resulting in a degraded environment. This program seeks to reach students using experiential methods that fully engage the learner.

Studies have shown that children spend more time inside playing computer games, etc., than exploring the outdoors. Learning-by-doing, experiential education has been shown to be retained the longest as compared to all learning methods. (Lieberman, 1994)

**Civic engagement**

The lack of meaningful youth engagement in local communities continues to be an area of emphasis. Georgia 4-H offers youth many opportunities to make positive contributions to their communities and statewide through the annual State 4-H Council, teen leadership summits, ambassador programs, 4-H Day at the Capitol, National 4-H Conference, Step Up and Lead programs, and other events coordinated by the state 4-H office. Four-H'ers learn valuable lessons through participating in service projects; attending the citizenship ceremony conducted at State 4-H Council; campaigning for local, district and state offices; visiting with their legislators at the Capitol; and other activities.

Georgia 4-H collaborates with numerous partners to provide civic engagement opportunities. Partners include school systems, nonprofits, state and national agencies, foundations, National 4-H Council, and National 4-H Headquarters (USDA National Institute of Food and Agriculture (NIFA)).

The FVSU 4-H program staff collaborated with UGA on the Office of Juvenile Justice and Delinquency Prevention (OJJDP) 4-H mentoring project in Twiggs County. FVSU 4-H collaborates with FVSU College of Agriculture, Family Sciences and Technology faculty colleagues, FVSU Cooperative Extension colleagues, Extension Committee on Organization and Policy's 4-H committee, National 4-H Council, USDA and NIFA, Georgia Department of Juvenile Justice, Connections on the Parkway in Centerville, Sylvester Housing Authority, Worth County school system, Peach County school system, Twiggs County school system, and Toombs County's Alice Blount Science Academy and Blount Youth Home to deliver FVSU 4-H's positive youth development program activities to Georgia's youth.

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

Year: 2017	Extension		Research	
	1862	1890	1862	1890
Plan	583.3	13.2	499.8	41.3
Actual	521.5	28.0	260.7	13.0

**II. Merit Review Process**

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

- Internal University Panel
- Combined External and Internal University External Non-University Panel

## **2. Brief Explanation**

Supervisors are responsible for determining merit based pay increases related to annual performance evaluations. Throughout the year, comments from external stakeholders are noted, especially in terms of county Extension faculty.

Both universities incorporated the above items in their respective review processes. All research projects conducted this year were peer-reviewed by internal and external reviewers. In addition, more than 20 percent of approved research projects are associated with multistate/integrated projects, which undergo an extensive review by the Southern Association of Agricultural Experiment Station Directors. Extension reviews the quality and relevance of state program goals at the state, district and county levels. Departmental Extension coordinator contacts provide insight at the state level. The program development team provides district-level input. This team consists of district program development coordinators, evaluation specialists and Extension administrators. County agents provide input directly to the program development team and the state Extension coordinators. The constituents provide input through the county council as part of the Extension leadership system.

## **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
- Survey of traditional stakeholder groups
- Survey of traditional stakeholder individuals

#### **Brief explanation.**

Each county Extension agent has an Extension leadership group that serves in an advisory capacity. Extension specialists and agents as well as administrators are also well-connected to industry and commodity groups and allied organizations.

After visiting with local advisory committees, county agents provide data directly to state specialists through listening groups, which are conducted annually and by individual departments for a total of a dozen or more meetings. The data from these agent/specialist sessions is then analyzed by the state program development team and recommendations are made for next year's programming. County agents also use input from advisory committees to plan, execute, evaluate and communicate programming at the local level.

This year, we were selected for a civil rights review. This process enabled us to take a deep look at advertisements and program accessibility. It also drove a discussion of best practices with the review team. This process was a very positive experience.

**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
- Open Listening Sessions
- Needs Assessments
- Use Surveys

**Brief explanation.**

Statewide stakeholders and potential collaborators were identified by faculty and recommendations on statewide advisory committees were made to the dean. The counties used a structured identification process to select a diverse advisory committee at the local level that included representatives of both traditional and nontraditional stakeholder groups. The majority of counties reassessed and rotated their advisory committee membership this year.

External review teams also provided suggestions as to new classifications of stakeholders, especially in regard to departmental advisory committees. The most dramatic changes in college research programs occur when new faculty members are hired. Departmental advisory committees help prioritize the needs of the stakeholders. Stakeholder input is also sought by members of search and screening committees prior to selecting candidates to interview and to final recommendations.

Georgia Cooperative Extension has a strong relationship with commodity groups and industry organizations. Extension utilizes these groups for needs assessments, industry trend awareness and feedback.

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

**1. Methods for collecting Stakeholder Input**

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

**Brief explanation.**

Individual county-level advisory committees meet up to four times each year. One statewide survey on youth development collected counties' input. The statewide CAES advisory committee met two times during the year. In addition, college administrators meet at least once a year with the Georgia Department of Agriculture, Georgia Farm Bureau and commodity boards to gather input, identify needs and discuss programming priorities.

### **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.**

All input is channeled to college administrators so they have the knowledge to make budgetary decisions. College administrators evaluate vacant positions in all departments based on these criteria before a decision is made to fill these positions or positions may be redirected as needed. The dean solicits input from all faculty, staff and stakeholders prior to making hiring decisions related to major administration positions. County agent and staff positions are reallocated to counties of greatest need and to those willing to contribute more county funding. Finally, legislative allocations greatly influence the type and amount of new positions added.

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

- Research efforts of the college must be balanced in order to meet the needs of stakeholders, communities, and the economic and environmental sustainability of the state.
- National reputation is important, provided local needs are addressed.
- Stakeholders seek a greater partnership with the college and will contribute their time, talent and resources to grow the college. Most are placing the long-term survival and enhancement of the college above the needs of their particular operation, organization or community. In most cases, they want to be part of the solution and are interested in the overall goals of the college.

**IV. Expenditure Summary**

<b>1. Total Actual Formula dollars Allocated (prepopulated from C-REEMS)</b>			
<b>Extension</b>		<b>Research</b>	
<b>Smith-Lever 3b &amp; 3c</b>	<b>1890 Extension</b>	<b>Hatch</b>	<b>Evans-Allen</b>
{No Data Entered}	{No Data Entered}	{No Data Entered}	{No Data Entered}

<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>	8961078	2614965	6535317	3094871
<b>Actual Matching</b>	8961078	2614965	6535317	3094871
<b>Actual All Other</b>	0	0	0	0
<b>Total Actual Expended</b>	17922156	5229930	13070634	6189742

<b>3. Amount of Above Actual Formula Dollars Expended which comes from Carryover funds from previous</b>				
<b>Carryover</b>	6271917	0	4596801	0

## V. Planned Program Table of Content

S. No.	PROGRAM NAME
1	Animal Production
2	Food Safety
3	Health & Nutrition
4	Home & Life Skills
5	Plant Production
6	Sustainability, Conservation & the Environment
7	Urban Agriculture
8	Youth & Family Development

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

**Program # 1**

**1. Name of the Planned Program**

Animal Production

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
112	Watershed Protection and Management	0%	0%	5%	0%
131	Alternative Uses of Land	0%	0%	5%	0%
133	Pollution Prevention and Mitigation	0%	0%	10%	0%
216	Integrated Pest Management Systems	20%	0%	10%	0%
301	Reproductive Performance of Animals	20%	35%	25%	20%
303	Genetic Improvement of Animals	0%	0%	15%	20%
304	Animal Genome	0%	0%	5%	0%
307	Animal Management Systems	20%	0%	10%	20%
311	Animal Diseases	20%	35%	10%	20%
601	Economics of Agricultural Production and Farm Management	20%	30%	5%	20%
	<b>Total</b>	100%	100%	100%	100%

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

1. Actual amount of FTE/SYs expended this Program

Year: 2017	Extension		Research	
	1862	1890	1862	1890
<b>Plan</b>	15.4	2.0	11.5	6.8
<b>Actual Paid</b>	14.1	2.0	10.1	6.8
<b>Actual Volunteer</b>	0.0	0.0	0.0	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
1548986	726379	1514123	933265
1862 Matching	1890 Matching	1862 Matching	1890 Matching
1548986	726379	1514123	933265
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

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

### 1. Brief description of the Activity

Research was conducted. County, regional, state and multistate meetings, trainings and workshops were held. Field days, on-site visits, tours and hands-on sessions took place. Diagnostic services were provided.

Research findings were shared via bulletins, newsletters, eXtension, layperson articles, industry publications, peer-reviewed journals, scientific proceedings, state and national conferences, broadcast media, websites, and expos.

#### **Aquaculture**

Research demonstrations, presentations, development of an aquaculture website and publications addressed requests from the aquaculture industry for technology on bluegill sunfish culture, alternative protein in feeds for catfish, and technical information on suitable aquaculture species for Georgia.

#### **Cattle**

The Master Cattlemen's Program was held once in the spring and once in the fall. The program provides educational programming on beef cattle across the state at the request of producers, local Extension offices and local cattlemen's associations.

Methodology and tools for improving genomic evaluation through better use of information and increase in accuracy were developed.

A study was conducted to examine the effect of the feeding rate on calf performance before weaning. The results were shared at a workshop and at the American Dairy Science Association annual meeting.

Workshops on heat stress were hosted. Producers learned the impact of environmental heat stress on dairy cattle and potential solutions from genetic, nutritional, reproductive and management perspectives.

Heat audits were performed in several grazing dairies to help producers assess cooling and heat abatement and to provide potential solutions for improvement.

Diagnostic services were also provided. Research trials were conducted to assess selective dry-cow therapy in managing mastitis in bred Holstein heifers, develop a prevention program to control mastitis with nutritional supplements, and develop a framework to implement recommendations for mastitis control and improve milk quality in the Southeast.



Forages and nutritional strategies were evaluated, and research findings from those evaluation projects were shared.

### **Poultry**

Research was conducted on the effects of poultry litter treatments on ammonia volatilization.

The animal waste management group is very active throughout the state. The group educates livestock and poultry producers and county agents using the most current information on nutrient management, water quality and air emissions for the area.

Calibrations of animal waste application systems were conducted at each farm visit to ensure the proper rate and distribution of the manure.

### **Equine**

Applied research on equine nutrition and parasite control, specifically diet formulation and alternative forages for horses, was conducted and presented.

### **Small Ruminants**

Specials offered training to establish a sustainable market for sericea lespedeza products.

Researchers developed rumen-escape dietary supplements (REDS) to improve small ruminant products for consumers' cholesterol health and longer shelf life.

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

The target audience included sheep, goat, beef and pork producers; dairy operators; aquaculture producers; county agents; veterinarians; industry professionals; environmental professionals; pet owners; peers in the scientific community; government officials and policymakers; landowners; limited-resource farmers; and those living in and around animal agriculture environments.

## **3. How was eXtension used?**

Although a detailed breakdown is unavailable at this time, 142 Georgia experts answered a total of 792 questions through eXtension.

Additionally, eXtension's Livestock and Poultry Environmental Learning Center webcasts are used by permitted livestock producers to obtain the continuing education units needed to maintain certification.

An group of equine specialists who participate in eXtension in the Southern U.S., including UGA, formed a forum similar to eXtension called the "Southern Equine Consortium" to publish a quarterly newsletter on relevant topics in the horse industry.

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

### **1. Standard output measures**

<b>2017</b>	<b>Direct Contacts Adults</b>	<b>Indirect Contacts Adults</b>	<b>Direct Contacts Youth</b>	<b>Indirect Contacts Youth</b>
<b>Actual</b>	320827	784830	683501	1672026

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

**Patent Applications Submitted**

Year: 2017

Actual: 2

**Patents listed**

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

**Number of Peer Reviewed Publications**

2017	Extension	Research	Total
Actual	36	21	40

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

**Output Target**

**Output #1**

**Output Measure**

- Number of significant publications including articles, bulletins and extension publications. (excluding peer reviewed articles)

Year	Actual
2017	96

**Output #2**

**Output Measure**

- Number of invited presentations by faculty directly resulting from the success of this planned program.

Year	Actual
2017	72

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

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

O. No.	OUTCOME NAME
1	Number of Master Cattlemen certifications granted through this planned program.
2	Increase in the farm gate value of livestock production in Georgia. Reported in millions of dollars.
3	Farm gate value of poultry production in Georgia. Value reported annually in millions of dollars.

## **Outcome #1**

### **1. Outcome Measures**

Number of Master Cattlemen certifications granted through this planned program.

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

- 1862 Extension

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

Change in Knowledge Outcome Measure

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

<b>Year</b>	<b>Actual</b>
2017	84

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

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

To be competitive in the beef market, producers must understand existing beef management practices and be informed of new technologies as they develop.

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

The UGA Beef Team currently offers the Master Cattlemen's Program, which involves detailed, in-depth, educational seminars related to beef cattle.

#### **Results**

There were 84 participants in the Master Cattlemen's Program in 2017.

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

<b>KA Code</b>	<b>Knowledge Area</b>
301	Reproductive Performance of Animals
303	Genetic Improvement of Animals
307	Animal Management Systems
311	Animal Diseases
601	Economics of Agricultural Production and Farm Management

## **Outcome #2**

### **1. Outcome Measures**

Increase in the farm gate value of livestock production in Georgia. Reported in millions of dollars.

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

- 1862 Extension
- 1890 Extension
- 1862 Research
- 1890 Research

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

Change in Condition Outcome Measure

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

<b>Year</b>	<b>Actual</b>
2017	4000

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

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

Livestock production comprises the largest portion of agriculture in Georgia and is valued at \$1.49 billion.

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

Specialists and agents delivered crucial, research-based information to farmers and producers.

#### **Results**

Livestock and aquaculture value decreased by approximately \$400 million, a reduction of about 21 percent.

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

<b>KA Code</b>	<b>Knowledge Area</b>
301	Reproductive Performance of Animals
303	Genetic Improvement of Animals
304	Animal Genome
307	Animal Management Systems
311	Animal Diseases
601	Economics of Agricultural Production and Farm Management

**Outcome #3**

**1. Outcome Measures**

Farm gate value of poultry production in Georgia. Value reported annually in millions of dollars.

**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>
2017	5340

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

**Issue (Who cares and Why)**

Poultry production is Georgia's largest agricultural industry, and agriculture is Georgia's largest overall industry.

**What has been done**

A survey of Georgia Cooperative Extension county agents and commodity specialists was conducted to provide annual, county-level information on the value of poultry production.

**Results**

The farm gate value for poultry totaled \$5.34 billion, a decrease of 3.9 percent.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
301	Reproductive Performance of Animals
303	Genetic Improvement of Animals
307	Animal Management Systems
311	Animal Diseases
601	Economics of Agricultural Production and Farm Management

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

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

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

### **Brief Explanation**

The lack of large, multibreed data sets with high-density marker genotypes precluded extensive evaluation of developed methods and tools using real data.

The high cost of fish feed limits aquaculture industry development. Input cost increases drive interest in aquaculture species with primary consumption among niches and enterprises, such as aquaponics, that are diversified across products.

Heat stress not only impacts the biology of cattle, but also results in significant economic losses for dairy producers. In Georgia, the negative impacts of heat stress are amplified due to the hot, humid, prolonged summer. Research and educational programs are in high demand in an effort to enhance animal growth, production and reproduction.

Many new or young farmers need educational programming in order to stay updated on best management practices, technology and marketing options.

Due to volatile feed, fuel and fertilizer prices, cattle producers frequently evaluate novel resources to meet the nutritional needs of their cattle. Additionally, periodic droughts force producers to find alternative feed sources for their cattle.

The permitting process for Georgia concentrated animal feeding operations (CAFOs) requires all operations to have a certified animal waste systems operator and a nutrient management plan written by a certified planner. The animal waste management group conducts that training on an annual basis, and it's well-attended every year.

Last year, emerging parasite resistance to current equine deworming techniques drove research to look at alternative forage programs as a means of parasite control, specifically forages with condensed tannins.

Heat and humidity negatively affect milk quality and mammary health, which drove dairy operators' interest in heat stress and milk quality. One major question they asked involved how to control mastitis and keep somatic cell counts low during the hot summer months. Decreasing milk prices also affected the some dairy operators' willingness to implement more costly prevention and control methods.

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

### **Evaluation Results**

### **Aquaculture**

Assistance, training and resources provided to county and state audiences reached more than 800 pond owners in more than 80 counties in Georgia. Case-by-case responses improved the value of the pond, property and fish population to an estimated \$3.5 million in 2017. Workshops, demonstrations and presentations reached more than 13,000 contacts. Services were provided directly to fish culture operations, which account for \$10.5 million in annual sales out of the industry's \$35 million in annual sales.

### **Cattle heat stress workshop**

Postworkshop evaluations averaged 1.66 on a scale where 1 was "Excellent," 2 was "Very Good," 3 was "Satisfactory," 4 was "Fair" and 5 was "Poor." Comments: "Keep having dairy meetings," "Very informative" and "We learned a lot."

### **Master Cattlemen's Program**

In 2017, 54 participants graduated from the Master Cattlemen's Program hosted by Houston County in Extension's Southwest District. The county agent was asked to deliver similar programming based on the success of the Master Cattlemen's Program. Thirty participants graduated from the Master Cattlemen's Program hosted by Franklin County in Extension's Northeast District. Graduates came from multiple counties in the immediate area.

The program received favorable evaluations. On a scale of 1 to 5, participants were asked to respond with their view of the program's ability to meet expectations. The program consistently received an average score of 4.5 on a scale where 5 is "Strongly Agree" with meeting the participants' expectations.

### **Equine**

Two local trainings -- with an average attendance of 15 to 20 participants -- one agent training and four presentations at national conferences of approximately 300 people were given. Between 50 and 75 emails or phone calls relating to horse nutrition and management were answered. One national industry grant was applied for in order to continue alternative forage testing and parasite control, and the status of that grant is pending.

### **General animal production**

Through short course and conference evaluations, 89 percent of participants indicated that their knowledge of the subject matter increased.

The UGA-scientist-developed methodologies that combine genomic, pedigree and phenotypic information for the purpose of genetic evaluation have been used by companies and breed associations in the beef cattle, dairy cattle, poultry, sheep, swine and fish industries.

## **Key Items of Evaluation**

Research findings were promising.

Extension programs were informative and well-received.



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

**Program # 2**

**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
311	Animal Diseases	0%	0%	5%	0%
401	Structures, Facilities, and General Purpose Farm Supplies	0%	0%	5%	0%
501	New and Improved Food Processing Technologies	0%	0%	10%	0%
502	New and Improved Food Products	0%	0%	5%	50%
503	Quality Maintenance in Storing and Marketing Food Products	35%	35%	50%	0%
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	30%	30%	15%	50%
723	Hazards to Human Health and Safety	35%	35%	10%	0%
	<b>Total</b>	100%	100%	100%	100%

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

1. Actual amount of FTE/SYs expended this Program

Year: 2017	Extension		Research	
	1862	1890	1862	1890
<b>Plan</b>	3.2	0.3	2.0	9.8
<b>Actual Paid</b>	2.9	0.3	1.7	9.8
<b>Actual Volunteer</b>	0.0	0.0	0.0	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
320038	90797	258824	1338137
1862 Matching	1890 Matching	1862 Matching	1890 Matching
320038	90797	258824	1338137
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

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

**1. Brief description of the Activity**

Research was conducted. County, regional, state and multistate meetings, trainings and workshops were held. Hands-on sessions took place.

Research findings were shared via bulletins, newsletters, eXtension, layperson articles, industry publications, peer-reviewed journals, scientific proceedings, state and national conferences, broadcast media, websites, and expos.

Faculty provided food safety classes, including ServSafe and Hazard Analysis and Critical Control Points (HACCP) classes, to Extension agents and select clientele, disseminated print media, and developed and provided online curricula and consumer resources. Specialists also provided information to be disseminated to media outlets by Extension agents.

Researchers investigated progeny production of *Habrobracon hebetor* on diapausing and nondiapausing larvae of Indian meal moths. The influence of grain quantity and grain depth on the ability of the *H. hebetor* to locate a host was studied. The influence of free space and structural complexity on the ability of the parasitoid to locate its host was investigated.

Researchers improved food quality using a new and safe pulsed ultraviolet light system for rapidly killing microorganisms on food surfaces to prevent foodborne illnesses.

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

The audience includes food industry managers, food service professionals, quality assurance professionals, HACCP coordinators, microbiologists, third-party auditors, government inspectors and county Extension agents.

**3. How was eXtension used?**

Although a detailed breakdown is unavailable at this time, 142 Georgia experts answered a total of 792 questions through eXtension.

Two courses exist on the eXtension website. One is a produce safety training course for small-farm and beginning farmers, and the other is a training for farmers market managers. Clients who complete the trainings also complete Qualtrics surveys on the course outcomes.

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

**1. Standard output measures**

2017	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Actual</b>	90947	2477739	39847	1085566

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

**Patent Applications Submitted**

Year: 2017

Actual: 0

**Patents listed**

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

**Number of Peer Reviewed Publications**

2017	Extension	Research	Total
<b>Actual</b>	2	2	4

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

**Output Target**

**Output #1**

**Output Measure**

- Number of significant publications including articles, bulletins and extension publications.

Year	Actual
2017	5

**Output #2**

**Output Measure**

- Number of persons taking and passing the HACCP certification exam.

Year	Actual
2017	25

**Output #3**

**Output Measure**

- Number of invited presentations by faculty directly resulting from the success of this planned program.

<b>Year</b>	<b>Actual</b>
2017	11

**Output #4**

**Output Measure**

- Number of food handlers receiving ServSafe certification from Extension Agent programs.

<b>Year</b>	<b>Actual</b>
2017	566

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

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

O. No.	OUTCOME NAME
1	Average percentage of increase food safety test scores as a result of programs conducted statewide.
2	Multiple or repeat attendance by food processing company personnel (ie, company sends more than one person to our course(s) from one year to the next)
3	Number of agents increasing knowledge as a result of food safety training by specialist.
4	Percent of agents demonstrating an increase in knowledge as a result of food safety training by specialist.

### **Outcome #1**

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

Average percentage of increase food safety test scores as a result of programs conducted statewide.

Not Reporting on this Outcome Measure

### **Outcome #2**

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

Multiple or repeat attendance by food processing company personnel (ie, company sends more than one person to our course(s) from one year to the next)

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

- 1862 Extension

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

Change in Action Outcome Measure

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

<b>Year</b>	<b>Actual</b>
2017	9

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

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

Food processing handlers require ongoing training to stay abreast of the latest information in food safety science.

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

Trainings were offered across the state. Food industry companies sent more than one person to our course(s) from one year to the next.

##### **Results**

Nine companies sent participants across multiple years.

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

<b>KA Code</b>	<b>Knowledge Area</b>
501	New and Improved Food Processing Technologies
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

**Outcome #3**

**1. Outcome Measures**

Number of agents increasing knowledge as a result of food safety training by specialist.

Not Reporting on this Outcome Measure

**Outcome #4**

**1. Outcome Measures**

Percent of agents demonstrating an increase in knowledge as a result of food safety training by specialist.

**2. Associated Institution Types**

- 1862 Extension

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

Year	Actual
2017	100

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

**Issue (Who cares and Why)**

The CDC estimates that roughly 1 out of 6 Americans, 48 million people, gets sick; 128,000 are hospitalized; and 3,000 die from foodborne diseases annually.

**What has been done**

Extension specialists trained agents to teach consumer food safety and food service education programs.

**Results**

One hundred percent of participants showed an increase in their food safety knowledge.

**4. Associated Knowledge Areas**

KA Code	Knowledge Area
503	Quality Maintenance in Storing and Marketing Food Products
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and

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

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

- Natural Disasters (drought, weather extremes, etc.)
- Competing Programmatic Challenges

#### **Brief Explanation**

Two external factors impacted work with stored-product moths: constructing simulated warehouses for a staged and gradual movement of the parasitoid to farmers warehouses and finding warehouse managers willing to let us use their facilities.

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

#### **Evaluation Results**

The program continues to be successful and meet the needs of the food service industry in Georgia.

The overall response to training programs and resource materials has been good.

Deployed parasitoids kept the Indian meal moth population below 10 percent. Diapausing Indian meal moth larvae were more susceptible than nondiapausing larvae.

The outcome of this work involves the elimination of pesticides when it comes to managing residual populations of postharvest moth pests in warehouses and other grain storage and milling facilities.

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

Overall response to training programs and resource materials has been good.



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

**Program # 3**

**1. Name of the Planned Program**

Health & Nutrition

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
305	Animal Physiological Processes	0%	0%	40%	0%
724	Healthy Lifestyle	60%	80%	10%	0%
802	Human Development and Family Well-Being	25%	20%	50%	0%
806	Youth Development	15%	0%	0%	0%
	<b>Total</b>	100%	100%	100%	0%

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

1. Actual amount of FTE/SYs expended this Program

Year: 2017	Extension		Research	
	1862	1890	1862	1890
<b>Plan</b>	3.8	0.2	3.5	0.8
<b>Actual Paid</b>	3.5	0.0	3.0	0.0
<b>Actual Volunteer</b>	0.0	0.0	0.0	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
384046	0	452942	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
384046	0	452942	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

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

### **1. Brief description of the Activity**

Health and nutrition research and studies were conducted. County, regional, state and multistate meetings, trainings and workshops were held.

Research findings and information were shared via bulletins, newsletters, eXtension, layperson articles, industry publications, peer-reviewed journals, scientific proceedings, state and national conferences, broadcast media, websites, and expos.

In Georgia, two-thirds of adults are overweight or obese and approximately 30 percent of children and adolescents are overweight or obese. Obesity and being overweight contribute to the development of chronic diseases such as cardiovascular disease (CVD), hypertension, diabetes, osteoarthritis and some cancers.

Fact sheets on weight control, physical activity, diabetes management and prevention, cardiovascular disease prevention, and cancer prevention were disseminated. Training and education about chronic disease prevention and control were provided to agents and select clientele. Information on chronic disease prevention, healthy eating and physical activity was provided to agents and media outlets for dissemination to the general population.

In-school classes as well as after-school and 4-H enrichment activities were conducted in a majority of Georgia's counties. Four-H Healthy Living ambassadors were trained as part of the Healthy Habits and Wellness 360° grants, and these trained youth conducted programs in their counties and districts and at Georgia 4-H Junior Conference and Fall Forum. Four-H Yoga for Kids leaders were trained, and they conducted programs in their counties, districts and at Senior 4-H Camp. Four-H summer camp classes on healthy living and exercise were conducted at 4-H camps across the state. Curricula for all ages were shared with county offices to use with local youth.

FVSU's Health and Nutrition Extension program identified and developed educational programs for clientele populations including the rural disadvantaged, working homemakers, small-scale family and part-time farmers, community leaders, youth, small-business operators, and other members of the general public in Georgia. The program provided clients with basic health and nutrition information. Activities covered disease prevention and the obesity crisis affecting communities. Information was disseminated through interactive learning projects, pamphlets and brochures, and demonstrations.

Research, using pigs as models, into stroke and traumatic brain injury tested stem cell therapies that showed significant improvement at the cellular, tissue and functional levels. In addition, using neural stem cell platform technology, a high-content neurogenesis screening system was developed that enables detection of toxicants that lead to cell death, changes in neurite outgrowth, branching, and differentiation, all of which could lead to significant neurodevelopment deficits.

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

Specialists primarily direct efforts toward educating and preparing county agents. As a result, agents reach parents, guardians, grandparents, child care providers and other caregivers to children and youth.

The planned program will also directly target limited-resource individuals and families.

### **3. How was eXtension used?**

Although a detailed breakdown is unavailable at this time, 142 Georgia experts answered a total of 792 questions through eXtension.

Communities of Practice through eXtension were used for input and to share successes.

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

**1. Standard output measures**

2017	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Actual</b>	863285	10505537	756079	9200919

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

**Patent Applications Submitted**

Year: 2017  
 Actual: 1

**Patents listed**

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

**Number of Peer Reviewed Publications**

2017	Extension	Research	Total
<b>Actual</b>	7	11	18

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

**Output Target**

**Output #1**

**Output Measure**

- Number of significant publications including articles, bulletins and extension publications. (excluding peer reviewed articles)

<b>Year</b>	<b>Actual</b>
2017	20

**Output #2**

**Output Measure**

- Number of invited presentations by faculty directly resulting from the success of this planned program.

<b>Year</b>	<b>Actual</b>
2017	99

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

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

O. No.	OUTCOME NAME
1	Percentage of participants that are likely to read/use nutrition labels when making food choices.
2	Percentage of participants that lose weight or increase physical activity/exercise or likelihood of engaging in physical activity/exercise.

### **Outcome #1**

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

Percentage of participants that are likely to read/use nutrition labels when making food choices.

Not Reporting on this Outcome Measure

### **Outcome #2**

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

Percentage of participants that lose weight or increase physical activity/exercise or likelihood of engaging in physical activity/exercise.

Not Reporting on this Outcome Measure

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

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

- Economy
- Public Policy changes
- Government Regulations
- Competing Public priorities

#### **Brief Explanation**

External factors that affected outcomes included the addition of resources from the National Institutes of Health, Department of Defense and the National Science Foundation, which led to additional defining experiments.

An external factor, the economy, affected outcomes because clients may have had work schedules that conflicted with educational sessions.

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

#### **Evaluation Results**

Evaluation materials were provided for diabetes, weight control and cancer programs. Pre- and postprogram knowledge and behavior evaluations were used. Participants completed pre-and post-tests after lessons and completed grids about their behaviors to show stages of change. All evaluations involved self-reporting.

Four-H Health Rocks! programming included a survey for youth who completed the program. They were asked to complete the survey to gauge their knowledge before taking the program as compared to their knowledge after the program. Four-H Common Measures were used to evaluate the knowledge gained by students participating in both the Healthy Habits and Wellness 360° grant programs.

The development of this high-content screening system will help the Environmental

Protection Agency and similar organizations detect and classify unknown and predicted toxins. Testing stem cell therapies in a pig stroke model will lead to the replacement and repair of damaged neural networks and suggests that this will occur in human stroke patients, which will lead to improved sensory, motor and cognitive function and improve the patient's quality of life. This platform technology can also be adapted to other central nervous system injuries such as spinal cord or traumatic brain injuries.

**Key Items of Evaluation**

Overall participant ratings of health and nutrition classes were good.

Evaluations by program clients demonstrated an increase in their health knowledge. Clients who responded showed a 25-percent gain in health knowledge.

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

**Program # 4**

**1. Name of the Planned Program**

Home & Life Skills

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
607	Consumer Economics	30%	40%	0%	0%
723	Hazards to Human Health and Safety	20%	0%	0%	0%
801	Individual and Family Resource Management	25%	30%	0%	0%
802	Human Development and Family Well-Being	25%	30%	0%	0%
	<b>Total</b>	100%	100%	0%	0%

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

1. Actual amount of FTE/SYs expended this Program

Year: 2017	Extension		Research	
	1862	1890	1862	1890
<b>Plan</b>	6.0	1.8	0.0	0.0
<b>Actual Paid</b>	5.6	1.8	0.0	0.0
<b>Actual Volunteer</b>	0.0	0.0	0.0	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
614474	635582	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
614474	635582	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

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

**1. Brief description of the Activity**

Extension specialists trained agents to provide financial literacy programs for youth, individuals in bankruptcy, and other adults based on identified needs. Specialists also developed curricula, print and online consumer resources, and program evaluations.

In the area of indoor air quality (IAQ), faculty conducted programs and exhibits on a range of healthy housing topics, disseminating relevant information through several media outlets. Specialists trained agents on how to promote healthy housing.

Faculty disseminated personal financial literacy fact sheets and provided personal financial management education classes to agents and select clientele.

Faculty also promoted online home buyer education and local county home buyer education workshops.

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

Specialists directed efforts primarily to county agents. As a result, agents then reach youth, parents, senior citizens, home buyers, families and others.

The FVSU faculty's target audience includes all Georgians and residents in surrounding areas with an emphasis on all limited-resource and low-income families and individuals.

**3. How was eXtension used?**

Although a detailed breakdown is unavailable at this time, overall, 792 questions were answered in eXtension by 142 Georgia experts.

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

**1. Standard output measures**

2017	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Actual</b>	218017	1688468	522806	4048945

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

**Patent Applications Submitted**

Year: 2017

Actual: 0

**Patents listed**

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

**Number of Peer Reviewed Publications**

2017	Extension	Research	Total
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<b>Actual</b>	4	0	4
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**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- Number of significant publications including articles, bulletins and extension publications. (excluding peer reviewed articles)

<b>Year</b>	<b>Actual</b>
2017	4

**Output #2**

**Output Measure**

- Number of invited presentations by faculty directly resulting from the success of this planned program.

<b>Year</b>	<b>Actual</b>
2017	1

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

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

O. No.	OUTCOME NAME
1	Total number of consumers transitioning from rental to homeownership after participating in this program.
2	The number of participants who tested their homes for indoor air quality contaminants as a result of the educational programs conducted by county agents.
3	The percentage of participants who increased their knowledge of Indoor Air Quality issues as a result of the educational programs conducted by county agents.

**Outcome #1**

**1. Outcome Measures**

Total number of consumers transitioning from rental to homeownership after participating in this program.

Not Reporting on this Outcome Measure

**Outcome #2**

**1. Outcome Measures**

The number of participants who tested their homes for indoor air quality contaminants as a result of the educational programs conducted by county agents.

**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>
2017	1064

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

**Issue (Who cares and Why)**

Indoor air quality problems are caused by indoor contaminants including, but not limited to, radon, environmental tobacco smoke, biological contaminants, combustion byproducts, household products, volatile organic compounds, pesticides, asbestos and lead. The health effects of these contaminants range from allergic reactions in sensitive populations to death.

**What has been done**

Extension specialists trained agents to provide indoor air quality programming to target populations, teaching consumers how to reduce exposure to indoor air quality contaminants in home, work and school environments. Specialists also developed curricula, print and online consumer resources, and program evaluations.

**Results**

A total of 1,064 training participants went on to test their homes for indoor air quality contaminants as a result of the educational programs conducted by county agents. This total is up 69 percent from last year.

#### 4. Associated Knowledge Areas

KA Code	Knowledge Area
607	Consumer Economics

#### Outcome #3

##### 1. Outcome Measures

The percentage of participants who increased their knowledge of Indoor Air Quality issues as a result of the educational programs conducted by county agents.

##### 2. Associated Institution Types

- 1862 Extension
- 1890 Extension

##### 3a. Outcome Type:

Change in Knowledge Outcome Measure

##### 3b. Quantitative Outcome

Year	Actual
2017	75

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

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

Indoor air quality problems are caused by indoor contaminants including, but not limited to, radon, environmental tobacco smoke, biological contaminants, combustion byproducts, household products, volatile organic compounds, pesticides, asbestos and lead. The health effects of these contaminants range from allergic reactions in sensitive populations to death.

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

Extension specialists trained agents to provide indoor air quality programming to target populations, teaching consumers how to reduce exposure to indoor air quality contaminants in home, work and school environments. Specialists also developed curricula, print and online consumer resources, and program evaluations.

###### **Results**

Seventy-five percent of participants reported an increase in knowledge of indoor air quality issues as a result of the educational programs conducted by county agents.

#### 4. Associated Knowledge Areas

KA Code	Knowledge Area
607	Consumer Economics

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

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

- Natural Disasters (drought, weather extremes, etc.)
- Competing Public priorities
- Competing Programmatic Challenges

### **Brief Explanation**

Extension agents providing housing programs encountered competing program challenges that affected the number of programs offered. In addition, one agent who provided programs retired. The online services expanded.

Natural disasters in 2017 increased interest in programs on disaster preparedness and issues related to healthy homes.

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

### **Evaluation Results**

Agent knowledge was assessed by evaluation tools specific to the content provided. The evaluation database was used to assess the population's changes in knowledge and intentions to change behavior by those reached through county agents. Most data collection was obtained at the time of the educational intervention via questionnaire.

Program evaluations indicate that 80 percent of participants increased their knowledge about green cleaning products. Seventy percent were more likely to safely store deadly look-alike products. Fifty percent were more likely to use UGA Extension as an informational resource. Sixty-five percent of those purchasing a radon test kit use it to test their home for radon gas.

Persons participating in pre-purchase counseling or home buyer education workshops were better prepared to purchase a home. About 75 percent of those completing the course purchased a home. An individual attending a home buyer workshop shared that he will use the information on his journey to becoming a first-time homebuyer, saying, "Not being pressured into buying until I had reviewed all the facts has already saved me around \$5,000." Another potential homebuyer attended an eight-hour workshop where she learned how to negotiate the funds toward her closing costs. She applied the knowledge gained and was successful in reducing her closing costs by \$6,000. In March she became a new homeowner.

### **Key Items of Evaluation**

Overall, participants rated programs well and indicated changes in behavior as a result of the information they received.

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

**Program # 5**

**1. Name of the Planned Program**

Plant Production

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	10%	0%	5%	5%
123	Management and Sustainability of Forest Resources	0%	100%	0%	5%
201	Plant Genome, Genetics, and Genetic Mechanisms	0%	0%	10%	40%
204	Plant Product Quality and Utility (Preharvest)	20%	0%	10%	5%
205	Plant Management Systems	10%	0%	10%	5%
206	Basic Plant Biology	20%	0%	20%	20%
211	Insects, Mites, and Other Arthropods Affecting Plants	5%	0%	10%	5%
212	Diseases and Nematodes Affecting Plants	5%	0%	10%	5%
213	Weeds Affecting Plants	10%	0%	10%	5%
216	Integrated Pest Management Systems	20%	0%	15%	5%
	<b>Total</b>	100%	100%	100%	100%

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

1. Actual amount of FTE/SYs expended this Program

Year: 2017	Extension		Research	
	1862	1890	1862	1890
<b>Plan</b>	28.5	0.0	22.0	2.0
<b>Actual Paid</b>	26.3	0.0	18.7	2.0
<b>Actual Volunteer</b>	0.0	0.0	0.0	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
2880347	0	2821187	274490
1862 Matching	1890 Matching	1862 Matching	1890 Matching
2880347	0	2821187	274490
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

Plant production research and studies were conducted. County, regional, state and multistate meetings, trainings and workshops were held. Faculty offered field days, on-site visits, tours, hands-on sessions and diagnostic services.

Research findings and information were shared via bulletins, newsletters, eXtension, layperson articles, industry publications, handbooks, peer-reviewed journals, scientific proceedings, state and national conferences, broadcast media, websites, expos and trade magazines.

#### **Plant Pests and Diseases**

A viral protein was identified and the protein's effect on gene expression was studied.

#### **Blueberries**

Research was conducted to evaluate many plant-growth regulators as inducers of blueberry fruit detachment.

The ultimate goal of the program is to generate information on aspects of blueberry ripening and postharvest fruit quality attributes to help the blueberry industry implement strategies for more uniform ripening and better practices for postharvest storage of blueberries.

#### **Vegetables**

One initiative evaluated sustainable and organic practices for vegetable production.

Research is currently underway to assess rotations for winter vegetable production. Other experiments are planned, especially in the area of variety evaluations.

Specialists conducted field and laboratory experiments to evaluate the efficacy of registered fungicides and experimental products with new active ingredients to suppress the diseases.

Faculty also held special meetings addressing whiteflies and viruses. The Georgia Pest Management Handbook was updated to reflect new registrations, emerging pest problems and resistance issues. A blog was started to address pest and production problems in commercial vegetable production.

#### **Peaches**

Brown rot is a pre- and postharvest disease of peaches. Research was carried out in the field on experimental farms and in collaboration with commercial producers.

#### **Pecans**

Data was collected on the pecan selections for nut quality, tree vigor, tree productivity and pest resistance. This program developed and promoted management strategies that should help to stabilize pecan

production from year to year.

**Peanuts**

Research was conducted to develop more economical production methods and to improve the Peanut Disease Risk Index.

**Row crops**

Research included fungicide trials, rust sentinel, nematicide trials and nematodes.

Scout schools (procedures for insect monitoring) were conducted. IPM programs were refined as new and novel information becomes available.

**Landowner Initiative for Forestry Education (LIFE)**

The primary goal for minority landowners served through the Landowner Initiative for Forestry Education (LIFE) remains timber management. Two workshops, conducted in partnership with stakeholder organizations, covered forest management and estate planning. Site visits with minority landowners were conducted in a 25-county target area.

**Watermelon**

Three candidate genes were identified in the chromosomal region associated with flowering in watermelon. Flowering patterns in commercial triploid, seedless and diploid pollenizer cultivars were determined and recommendation were made to facilitate synchronized flowering.

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

The target audience for this program includes county agents; scientific peers; conservation agencies; policy makers; utility companies; landowners; retail establishments; consumers; students; producers; consultants; industry personnel; K-12 teachers; regulatory agencies; agribusinesspeople; and small, minority, and limited-resource landowners and farmers.

**3. How was eXtension used?**

Although a detailed breakdown in unavailable at this time, overall, 792 questions were answered in eXtension by 142 Georgia experts.

In eXtension Campus, we had 37 participants in our Plant Diseases and Disorders module and 75 participants in our Weeds of the SE module.

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

**1. Standard output measures**

2017	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Actual</b>	754895	9634611	133127	1699073

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

**Patent Applications Submitted**

Year: 2017  
 Actual: 10



**Patents listed**

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

**Number of Peer Reviewed Publications**

<b>2017</b>	<b>Extension</b>	<b>Research</b>	<b>Total</b>
<b>Actual</b>	136	133	136

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

**Output Target**

**Output #1**

**Output Measure**

- Number of invited presentations by faculty directly resulting from the success of this planned program.

<b>Year</b>	<b>Actual</b>
2017	340

**Output #2**

**Output Measure**

- Number of significant publications including articles, bulletins and extension publications.

<b>Year</b>	<b>Actual</b>
2017	130

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

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

O. No.	OUTCOME NAME
1	Number of disease samples processed by diagnostic laboratory.

**Outcome #1**

**1. Outcome Measures**

Number of disease samples processed by diagnostic laboratory.

**2. Associated Institution Types**

- 1862 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2017	95638

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

**Issue (Who cares and Why)**

When problems requiring diagnostics present in the field, time is always a critical factor. From identifying a threat to recommending a treatment plan, timely transfer of information from field to lab is crucial. Rapid diagnosis can make all the difference in successfully preserving a crop or efficiently eliminating a harmful pathogen.

**What has been done**

Diagnostic services provided included CEQ (pesticide and fruit quality), feeds, water microbiology, waste water, GA EPD, animal waste, SPW plant tissue, water chemistry, soil, and others.

**Results**

Diagnostic services were provided for 95,638 samples.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
102	Soil, Plant, Water, Nutrient Relationships
204	Plant Product Quality and Utility (Preharvest)
213	Weeds Affecting Plants

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

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

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

### **Brief Explanation**

2017 was a year with devastatingly low yields, and balancing the costs and benefits of insect pest management was challenging for peach growers.

Peach production in the Southeast was severely affected by a lack of required chilling and a late hard frost. This extreme environmental impact resulted in some peach growers losing 90 percent of their crop, which significantly affected peach pest management.

As a result of freeze damage and low chill hours, only one successful peach trial was conducted. Likewise, most blueberries were severely damaged by freeze events, and diseases did not develop in many trials.

A mild winter followed by a warm, dry spring and summer led to extreme pest pressure from whiteflies. The addition to viral diseases vectored by whiteflies made management almost impossible.

A hurricane in late fall helped mediate this situation, but relief from the storm was too little, too late for most vegetable production.

New farm bill regulations, state budget deficits, weather and the overall economy affected some programs.

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

### **Evaluation Results**

Recommendations based on the results from the 2017 season have been included in the MyIPM smartphone application and the "2018 Southeastern Peach, Nectarine, and Plum Pest Management and Culture Guide."

For a peach rust trial, Abound and Aprovia fungicide treatments provided the highest levels of control, with virtually no disease symptoms at the time of assessment. Orbit, Kocide high rate, Kocide low rate, and Sulfur provided statistically equivalent control that was significantly different from the untreated control. Frequently, leaf phytotoxicity (shot holes, purpling and defoliation) was observed on leaves treated with the high Kocide rate. Phytotoxicity was observed to a lesser extent on those leaves treated with the low Kocide rate, but it was still significant.

We also conducted a peach scab trial with dormant applications of dormant superior oil plus chlorothalonil fungicide. Additional trials with multiple dormant applications are warranted by these results.

Following a mild winter in 2016 and a warm, dry spring and summer, pest pressure from whiteflies and the viruses they vectored made the fall production of many vegetable crops almost impossible. Tests proved that while the insecticides used were efficacious on the insects, nothing suppressed viral disease.

County agents were in close contact with vegetable producers in Georgia. Their input was solicited to determine if insect pest management educational programs and research/demonstrations are properly targeted or need modification. Agents received grower input through county production meetings and face-to-face interactions. The Commodity Commission for Vegetables requested specific research areas that also helped evaluate and focus the program. Industry representatives provided a great deal of input through face-to-face contact.

Based on the low-input pest management recommendations, we potentially saved growers between \$75 and \$300 per acre in insecticide costs alone. For growers managing thousands of acres of peaches, that would lead to significant savings, particularly in a year when crop yields were devastatingly low.

Genes were identified that control flowering time, and DNA markers were developed for more efficient selection of specific flowering patterns in seedless watermelon. We evaluated 22 triploid and 14 pollenizer cultivars. As a result, watermelon growers can select appropriate pollenizers for seedless watermelon production.

In the LIFE program, 85 percent of workshop participants increased their knowledge of forest management practices and general estate planning.

### **Key Items of Evaluation**

There were several positive findings in field experiments for fruits, berries, row crops and vegetables.

Research findings enabled scientists to update grower manuals and resources.

County agents and growers continue to inform the direction of the program. Continued commodity commission and industry support indicate satisfaction with the program's proceedings. A viral protein that affects cell cycle was also identified.

The LIFE program worked with over 50 small and/or minority landowners through a workshop series to increase their knowledge of sustainable forest practices and estate planning. This series of workshop sessions produced a raised awareness of 85 percent among participants in the knowledge areas of forest management and estate planning. Five estate planning wills were completed for minority landowners, creating clear titles to over 500 acres.

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

**Program # 6**

**1. Name of the Planned Program**

Sustainability, Conservation & the Environment

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
133	Pollution Prevention and Mitigation	20%	20%	20%	20%
403	Waste Disposal, Recycling, and Reuse	20%	20%	20%	20%
602	Business Management, Finance, and Taxation	20%	20%	20%	20%
603	Market Economics	20%	20%	20%	20%
605	Natural Resource and Environmental Economics	20%	20%	20%	20%
	<b>Total</b>	100%	100%	100%	100%

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

1. Actual amount of FTE/SYs expended this Program

Year: 2017	Extension		Research	
	1862	1890	1862	1890
<b>Plan</b>	21.1	1.2	7.5	4.0
<b>Actual Paid</b>	19.5	1.2	6.5	4.0
<b>Actual Volunteer</b>	0.0	0.0	0.0	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
2137857	435828	970592	548979
1862 Matching	1890 Matching	1862 Matching	1890 Matching
2137857	435828	970592	548979
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**

Sustainability, conservation and environmental research was conducted. County, regional, state and multistate meetings, trainings, and workshops were held. Field days, on-site visits, tours, hands-on sessions and diagnostic services were provided.

Research findings were shared via bulletins, newsletters, eXtension, layperson articles, industry publications, peer-reviewed journals, scientific proceedings, state and national conferences, broadcast media, websites and expos.

#### **Agricultural Economics**

Faculty developed and implemented quantitative and qualitative assessment tools of nonmarket/environmental goods and services. They then analyzed regulatory options to discern the economic advantages and disadvantages of various approaches.

Faculty created improved information to assist local governments in cost-effectively meeting demands for public services, financing public programs, providing infrastructure needs and designing incentives for private-sector initiatives and involvement. They worked to improve understanding of the roles of human capital, social capital and lifelong learning in rural economic development.

Faculty worked to determine the impacts of structural changes in the agribusiness sector on market access, bargaining power, concentration, location of production, financial arrangements, rural communities and the environment. Faculty also evaluated changes in policies and credit risk assessment methodologies used by lenders that would affect their relationship with farmers.

Researchers continue to analyze specific risk management strategies, instruments and portfolios, especially new instruments and arrangements. There were also attempts to assist farmers and lenders with the adoption of improved financial accounting, reporting and decision-making systems.

#### **Environmental Sciences**

Knowledge in environmental sciences was improved by applied and basic research studies and through the dissemination of results through journal articles, conferences and professional meetings. Extension outputs to improve public understanding of environmental management consisted of bulletins, flyers, short courses, meetings and web pages related to implementing environmental management programs.

Faculty provided educational programs for consumers related to water conservation, energy conservation and waste reduction. In-service trainings were conducted, and we had an exhibit at the Georgia National Fair.

In the area of energy conservation in poultry production, field research was conducted to develop improved energy efficiency techniques. Educational meetings were conducted with poultry farmers and poultry industry representatives. Educational materials were prepared and distributed directly to poultry producers in Georgia.

Researchers investigated the environmental effects of winter cover crops to improve the production of row crops and biomass in the southern coastal plain.

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

The target audience includes poultry farmers, poultry industry environmental personnel, poultry industry flock supervisors and county agents.

Also targeted are public sector (federal and state) decision-makers, agents, environmental interest groups, natural resource users, local entrepreneurs, commercial greenhouse and nursery growers, food product companies, industry representatives, consultants, contractors, media and the general public.

### 3. How was eXtension used?

Although a detailed breakdown is unavailable at this time, overall, 792 questions were answered in eXtension by 142 Georgia experts.

There is an eXtension Home Energy site, but it hasn't been very active.

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

##### 1. Standard output measures

2017	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Actual</b>	332865	1460920	288231	1265024

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

###### Patent Applications Submitted

Year: 2017  
Actual: 2

###### Patents listed

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

###### Number of Peer Reviewed Publications

2017	Extension	Research	Total
<b>Actual</b>	109	108	109

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

##### Output Target

###### Output #1

###### Output Measure

- Number of significant publications including articles, bulletins and extension publications. (excluding peer reviewed articles)

**Year                      Actual**



2017 102

**Output #2**

**Output Measure**

- Number of invited presentations by faculty directly resulting from the success of this planned program.

<b>Year</b>	<b>Actual</b>
2017	196

**Output #3**

**Output Measure**

- Total number of site visits made to small, minority, and limited resource landowners and farmers

<b>Year</b>	<b>Actual</b>
2017	285

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

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

O. No.	OUTCOME NAME
1	Total number of site visits made to small, minority, and limited resource landowners and farmers

## **Outcome #1**

### **1. Outcome Measures**

Total number of site visits made to small, minority, and limited resource landowners and farmers

Not Reporting on this Outcome Measure

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

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

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

#### **Brief Explanation**

Extension agents face many competing programmatic challenges and offer few programs on energy or water.

As a result of new opportunities in other research areas, activities related to irrigation are slowing down.

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

#### **Evaluation Results**

Research, teaching and Extension activities in the environmental sciences are continuously evaluated by the amount of grant funding received, the quantity of peer-reviewed publications, student surveys, alumni surveys, short course and training session evaluations, and evaluations of public meetings. Outcomes are determined through all of these measures.

Landfills continue to fill, but recycling has expanded in the state.

Water quality and well-water testing continue to be issues of concern.

Growers in Georgia and the U.S. have expressed interest in implementing developed methodology and technology, but scaling up from small-scale trials to large-scale implementation has been a challenge. We have not been able to obtain funding to pursue this challenge.

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

Responses to presentations and workshops showed an increase in knowledge and satisfaction with the information presented.

Research results were promising for biofuels and other crops.

Producers indicated the intention is adopt energy-reducing practices.

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

**Program # 7**

**1. Name of the Planned Program**

Urban Agriculture

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	10%	0%	10%	0%
111	Conservation and Efficient Use of Water	10%	0%	10%	0%
124	Urban Forestry	10%	0%	10%	0%
206	Basic Plant Biology	10%	0%	10%	0%
211	Insects, Mites, and Other Arthropods Affecting Plants	5%	0%	5%	0%
213	Weeds Affecting Plants	10%	0%	10%	0%
216	Integrated Pest Management Systems	10%	0%	10%	0%
404	Instrumentation and Control Systems	5%	0%	5%	0%
405	Drainage and Irrigation Systems and Facilities	5%	0%	5%	0%
602	Business Management, Finance, and Taxation	10%	0%	10%	0%
605	Natural Resource and Environmental Economics	5%	0%	5%	0%
806	Youth Development	10%	0%	10%	0%
	<b>Total</b>	100%	0%	100%	0%

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

1. Actual amount of FTE/SYs expended this Program

Year: 2017	Extension		Research	
	1862	1890	1862	1890
<b>Plan</b>	2.5	0.8	4.0	0.0
<b>Actual Paid</b>	2.3	0.0	3.4	0.0
<b>Actual Volunteer</b>	87.3	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
256031	0	517649	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
256031	0	517649	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

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

### 1. Brief description of the Activity

Research on urban agriculture was conducted. County, regional, state and multistate meetings, trainings, and workshops were held. Field days, on-site visits, tours, hands-on sessions and diagnostic services were provided.

Research findings were shared via bulletins, newsletters, eXtension, lay-person articles, industry publications, peer-reviewed journals, scientific proceedings, state and national conferences, broadcast media, websites and expos.

#### Master Gardener Program

In 2017, we had 285 new Master Gardener Extension Volunteers (MGEVs) and 2,504 returning, for a total of 2,789 MGEVs. They volunteered a total of 181,667 hours.

All MGEVs are required to complete 42 hours of initial classroom training and examination before volunteering, successfully complete a UGA Volunteer Agreement and background screening, and complete 50 hours of volunteer service in support of Extension-approved projects.

The ways MGEVs volunteer include:

- Diagnostics;
- Presentations and demonstrations; and
- Community and distribution gardens.

#### Turfgrass Research

Faculty developed basic research on turfgrass pathogen biology, genetic-disease resistance and fungicide resistance.

Researchers conducted fungicide research trials on the main turfgrass diseases each season, resulting in more than 40 trials and 12 specialty research reports, evaluating more than 150 treatments in the last two years. Researchers also established nematode studies to determine plant-pathogen nematode species and implemented nematicide trials. Specialists conducted 75 training sessions for industry professionals and county agents for the science-based dissemination of information.

#### Translational Genomics of Ornamental Plants

Genetic screening for induced mutations in these genes may make targeted mutation breeding a feasible approach.

MLO and eIF4E family genes of petunia were isolated and sequenced. The knockout of PhMLO1 resulted in resistance to powdery mildew. Petunia seeds were mutagenized with EMS and high-resolution melting

analysis was used to identify an induced mutation in MLO1. Two induced mutations in PhMLO1 were identified.

Faculty collaborated with the USDA Southeast Fruit and Nut Laboratory to mutagenize peaches.

**Managing Plant Diseases in Ornamental Plant Nurseries**

Fungicide resistance has been identified within Pythium and Phytophthora populations from ornamental plants in Georgia; however, the availability of alternate chemistries to manage these pathogens has alleviated grower concerns. Work in identifying new pathogens and their management is now a higher priority area for the ornamental industry.

A fungicide efficacy table was created and distributed as an Extension bulletin and on the Southern Nursery Integrated Pest Management (SNIPM) working group webpage. A regional pest management guide (2017 Southeastern US Pest Control Guide for Nursery Crops and Landscape Plantings) was also written. One book was also published, "IPM for Shrubs in Southeastern US Nursery Production: Volume II."

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

The target audience for this planned program includes urban agriculture industry professionals, public policy makers and regulators, county agents, homeowners, scientific peers, golf course superintendents, turfgrass professional managers, landscape companies, sod producers, grounds maintenance personnel, sports fields managers, general green industry personnel, Master Gardeners, arborists, city foresters, ornamental plant breeders and the general public.

**3. How was eXtension used?**

Although a detailed breakdown is unavailable at this time, overall, 351 questions were answered in eXtension by 58 Georgia experts.

We also had 64 participants in our Urban Forestry eXtension Campus module.

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

**1. Standard output measures**

2017	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Actual</b>	708121	11333315	47615	762075

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

**Patent Applications Submitted**

Year: 2017

Actual: 0

**Patents listed**

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

**Number of Peer Reviewed Publications**

<b>2017</b>	<b>Extension</b>	<b>Research</b>	<b>Total</b>
<b>Actual</b>	29	6	29

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

**Output Target**

**Output #1**

**Output Measure**

- Number of significant publications including articles, bulletins and extension publications. (excluding peer reviewed articles)

<b>Year</b>	<b>Actual</b>
2017	61

**Output #2**

**Output Measure**

- Number of invited presentations by faculty directly resulting from the success of this planned program.

<b>Year</b>	<b>Actual</b>
2017	27

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

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

O. No.	OUTCOME NAME
1	Number of website hits, page views, or downloads from the Center for Urban Ag site.
2	Number of Master Gardener Extension Volunteer hours served.



## **Outcome #1**

### **1. Outcome Measures**

Number of website hits, page views, or downloads from the Center for Urban Ag site.

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

- 1862 Extension

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

Change in Action Outcome Measure

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

<b>Year</b>	<b>Actual</b>
2017	444304

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

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

In order to remain vital and relevant to the state, CAES must focus its resources and talents on the issues involved in urbanization and the needs of Georgia's increasing urban and suburban populations. The goal of the Center for Urban Agriculture is to assist in this process.

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

The Center for Urban Agriculture provides an organization structure designed to facilitate issue identification and scientific cross-fertilization among investigators, agents, industry and homeowners. It offers continuing education programs that are relevant to the urban environment.

#### **Results**

Web hits: 444,304 (Almost 26 percent more than last year)

Videos: 248,228 (57,419 on Vimeo and 190,809 on YouTube)

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

<b>KA Code</b>	<b>Knowledge Area</b>
102	Soil, Plant, Water, Nutrient Relationships
111	Conservation and Efficient Use of Water
124	Urban Forestry
206	Basic Plant Biology
211	Insects, Mites, and Other Arthropods Affecting Plants

213	Weeds Affecting Plants
216	Integrated Pest Management Systems
404	Instrumentation and Control Systems
405	Drainage and Irrigation Systems and Facilities

**Outcome #2**

**1. Outcome Measures**

Number of Master Gardener Extension Volunteer hours served.

**2. Associated Institution Types**

- 1862 Extension

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2017	181667

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

**Issue (Who cares and Why)**

Consumer clientele make decisions every day how to maintain landscapes. These decisions influence water quality, yard waste management and the quality of community landscapes.

**What has been done**

Agents trained and managed Master Gardeners, who in turn provide valuable resources and knowledge to Georgians.

**Results**

A total of 285 new and 2,504 returning Master Gardeners contributed a total of 181,667 volunteer hours.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
102	Soil, Plant, Water, Nutrient Relationships
111	Conservation and Efficient Use of Water
206	Basic Plant Biology
211	Insects, Mites, and Other Arthropods Affecting Plants
213	Weeds Affecting Plants

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

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

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Competing Public priorities
- Competing Programmatic Challenges

### **Brief Explanation**

Changes in weather patterns impacted this planned program. Time constraints due to additional responsibilities added to PI (retirement of faculty and inability to fill positions) also affected research.

Hurricanes in 2017 significantly impacted ornamental plant production and disease development. New diseases, such as boxwood blight was spread through landscape plantings as a result of the cooler, wet weather. The economy is improving, which has increased ornamental plant production and sales over past years. A quarantine on boxwood shipments into TN and PA were established that is impacting GA producers and requiring nurseries to participate in the Boxwood Blight Compliance Agreement.

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

### **Evaluation Results**

The Georgia Master Gardener Program, continuously active for 38 years under the direction of UGA Extension in more than 60 counties across the state, continues to train volunteers to assist agents in Extension educational program delivery. Master Gardener Extension Volunteers (MGEVs) augment the county Extension agents' efforts to help fulfill the mission of Extension of providing quality, relevant outreach and continuing education programs and services to local citizens. In 2016, 34 counties recruited and trained 380 new volunteers to assist UGA Extension in educational delivery. More than 2,800 MGEVs returned 191,654 volunteer hours at a value of \$4,515,368 to UGA and their communities. This is roughly equivalent to 95 full-time staff. As a result of educational activities offered by MGEVs, Georgians are able to make environmentally sound gardening decisions. Because MGEVs work with Georgians to answer questions and solve problems, insects and diseases can be treated with appropriate controls, plant choices can be made to enhance landscapes and property values, individuals can grow their own fruits and vegetables, and youth gain exposure to the joy and wonder of gardening. As a result of MGEV efforts, agents are able to devote time to developing targeted educational programs that address local issues and needs. MGEVs ultimately help Extension achieve its mission of helping Georgians become healthier, more productive, financially independent and environmentally responsible.

### **Key Items of Evaluation**

Participant response to workshops and presentations has been overwhelmingly positive. They reported an increase in knowledge and intent to adopt research-based best practices.

Master Gardener volunteers demonstrated a wealth of knowledge they shared with the general public

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

**Program # 8**

**1. Name of the Planned Program**

Youth & Family 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
134	Outdoor Recreation	5%	0%	0%	0%
135	Aquatic and Terrestrial Wildlife	5%	0%	0%	0%
136	Conservation of Biological Diversity	5%	0%	0%	0%
206	Basic Plant Biology	5%	0%	0%	0%
214	Vertebrates, Mollusks, and Other Pests Affecting Plants	5%	0%	0%	0%
307	Animal Management Systems	5%	0%	0%	0%
315	Animal Welfare/Well-Being and Protection	5%	0%	0%	0%
608	Community Resource Planning and Development	5%	0%	0%	0%
802	Human Development and Family Well-Being	10%	20%	0%	0%
806	Youth Development	50%	80%	0%	0%
	<b>Total</b>	100%	100%	0%	0%

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

1. Actual amount of FTE/SYs expended this Program

Year: 2017	Extension		Research	
	1862	1890	1862	1890
<b>Plan</b>	8.1	3.0	0.0	0.0
<b>Actual Paid</b>	7.5	2.0	0.0	0.0
<b>Actual Volunteer</b>	94.0	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
819299	726379	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
819299	726379	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

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

### 1. Brief description of the Activity

In the area of Science, Engineering & Technology, we offered living history, ropes, team building, ecology, outdoor studies, animal studies, EE programming to Georgia youth.

4-H Ambassador Program offered SET track; Water Friends Curriculum was offered to fifth grade clubs; National 4-H Science Day took place in October.

Additionally, a weather and climate education program was introduced, as well as Mission Make It: Georgia 4-H Engineering Challenge, and an educational program about zoonotic disease prevention.

In the area of Civic Engagement, Georgia 4-H provided opportunities for youth and adults to work collaboratively at the county, district, and state levels to implement a variety of programs and service opportunities. For example, 4-H'ers attending Citizenship Washington Focus initiated a service project related to human trafficking that was shared in their local communities and at a statewide conference for high-school age 4-H'ers.

In addition to ongoing civic engagement and leadership programs for 4-H members, Georgia 4-H continued to offer Step Up and Lead conferences in partnership with the Georgia Association of Elementary School Principals and the Georgia Association of Middle School Principals. The conferences feature motivational speakers and interactive workshops that empower youth to seek out and engage in civic and leadership opportunities in their schools and communities. Step Up and Lead has strengthened the partnership between 4-H and school systems, as well as impacting the leadership abilities of elementary and middle school students for many years to come.

In the Youth Horse Program, youth participated in a variety of State 4-H Horse Program contests, including Horse Quiz Bowl, Hippology, Horse Judging, and Horse Show. In addition, two 4-H members mastered in the Horse Program by successfully completing all requirements in the Horseman's Books, and passing a written and riding test.

In Junior Livestock Programs, the UGA Animal and Dairy Science Department staff and 4-H staff in cooperation with State Department of Education Agricultural Education staff offer livestock show projects to 4-H and FFA members in Georgia. In these programs, young people raise and care for cattle, sheep, goats or swine. After the animals are trained, youth compete in shows and use these experiences as the basis for other competitions including record keeping, public speaking and Quiz Bowl events.

Participants exhibited their livestock projects in October (Market Lambs and market goats) and/or February (Breeding Beef Heifer, Market Steer, Commercial Dairy Heifer, Breeding Ewe, Breeding Doe, Market Hog) at the Georgia National Fairgrounds. During the event, nine (9) scholarships were awarded, record book

winners were recognized in twelve (12) divisions, and six (6) students were spotlighted for their outstanding commitment to their project area. FVSU Family Life offered various programs on enhancing parenting/care giving skills and provided information on health, home maintenance, and community services. The program also offered conferences for senior citizens, childcare providers, and youth.

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

The target audience for this planned program includes two groups. County agents and volunteers will be targeted to multiply the efforts of faculty associated with this program. In many cases, faculty will have direct contact with the youths.

All Georgia youths from kindergarten through college are targeted for life skill development programs. The in-school club program will target fifth through eighth grades. Different activities within the program will target different ages.

Many programs identify more specific audiences. An example of these would be programs that target youth of military families or programs that target audiences at risk. Some programs target low-income and limited-resource families.

**3. How was eXtension used?**

Although a detailed breakdown is unavailable at this time, overall, 351 questions were answered in eXtension by 58 Georgia experts.

eXtension was used to provide on-going webinars and information resources on the subject of 4-H best practices, professional development, and positive youth development. eXtension services, provides 4-H professionals with relevant knowledge that strengthens our 4-H staff's knowledge base about 4-H youth development, and helps to keep us informed on 21st century positive youth development best practices.

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

**1. Standard output measures**

2017	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Actual</b>	1871073	3691239	9384166	18513007

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

**Patent Applications Submitted**

Year: 2017  
 Actual: 0

**Patents listed**

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

**Number of Peer Reviewed Publications**

2017	Extension	Research	Total
Actual	4	0	4

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

**Output Target**

**Output #1**

**Output Measure**

- Number of significant publications including articles, bulletins and extension publications. (excluding peer reviewed articles)

Year	Actual
2017	31

**Output #2**

**Output Measure**

- Number of invited presentations by faculty directly resulting from the success of this planned program.

Year	Actual
2017	45

**Output #3**

**Output Measure**

- Number of Leadership, Entrepreneurship, and Science Meeting sessions coordinated  
Not reporting on this Output for this Annual Report



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

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

O. No.	OUTCOME NAME
1	Total number of youth participants that will enhance decision making skills and develop positive leadership skills, increase their knowledge of entrepreneurship education, and increase their knowledge of science education.
2	4-H total enrollment

**Outcome #1**

**1. Outcome Measures**

Total number of youth participants that will enhance decision making skills and develop positive leadership skills, increase their knowledge of entrepreneurship education, and increase their knowledge of science education.

**2. Associated Institution Types**

- 1890 Extension

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2017	9585

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

**Issue (Who cares and Why)**

It is critical to create and implement youth programs that meet the needs and challenge the strengths of all youth that live in Georgia and throughout America.

**What has been done**

FVSU 4-H youth programs were offered across the state.

**Results**

Of youth participants, 9,585 enhanced their decision-making skills and developed positive leadership skills, increased their knowledge of entrepreneurship, and increased their knowledge of science.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
608	Community Resource Planning and Development
806	Youth Development

**Outcome #2**

**1. Outcome Measures**

4-H total enrollment

**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>
2017	169708

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

**Issue (Who cares and Why)**

Youth make up almost 25 percent of Georgia's population.

**What has been done**

4-H is delivered by Cooperative Extension that provides experiences where young people learn by doing. Kids complete hands-on projects in areas like health, science, agriculture and citizenship, in a positive environment where they receive guidance from adult mentors and are encouraged to take on proactive leadership roles. Kids experience 4-H through in-school and after-school programs, school and community clubs and 4-H camps.

**Results**

A total of 169,708 young Georgians gained experience and knowledge through enrollment in 4-H programs.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
134	Outdoor Recreation
135	Aquatic and Terrestrial Wildlife
136	Conservation of Biological Diversity
206	Basic Plant Biology
214	Vertebrates, Mollusks, and Other Pests Affecting Plants
307	Animal Management Systems

315	Animal Welfare/Well-Being and Protection
608	Community Resource Planning and Development
802	Human Development and Family Well-Being
806	Youth Development

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

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

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Competing Public priorities

##### **Brief Explanation**

While Georgia 4-H continues to provide meaningful opportunities for youth working in partnership with adults, our priority areas shift annually based on the specific needs identified by the local Extension leadership and program development team. In addition, some collaborators have changed their focus, resulting in minor modifications in the programs and/or events delivered by Georgia 4-H.

The downturn of the economy resulted in fewer youth involved in horse activities, so numbers have been declining slightly. This is consistent with other youth programs throughout the country.

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

##### **Evaluation Results**

During the 2016-17 school year, the 4-H Environmental Education Program reached 38,925 participants, and since its inception in 1979, the program has served over 1,151,000 participants. Evaluation data collected throughout the year demonstrates a statistically significant increase in participants' positive relationships with their classmates; positive relationships with their teachers; knowledge about the ecosystems of Georgia; knowledge that their behaviors affect the environment; and connection to nature.

Most youth self-reported that they had increased their knowledge of the subject matter, that they intended to positively change their behaviors, and that they were better prepared to engage in civic and/or leadership responsibilities. An intensive study of leadership development for 4-H'ers serving in officer positions is currently underway.

During the 2016-17 school year, 2,339 4-H and FFA members exhibited 3,477 animal projects. The Georgia State Lamb and Goat Show, held in conjunction with the 2016 Georgia National Fair, had 595 youth enter with 300 lambs and 920 goats. At the Georgia State Heifer, Steer, Commercial Dairy Heifer, Breeding Ewe, Breeding Doe, Market Hog Shows held in February, 390 youths entered with 587 beef heifers, 155 youths entered with 188 steers, 260 youths entered with 338 commercial dairy heifers, 1,259 youths entered with 2,104 market hogs, 66 youths entered with 120 ewes, and 139 youths entered with 207 does.

Based on national 4-H common measures, FVSU 4-H implemented pre- and post-program evaluations for each development area. Youth participants reported acquiring knowledge in science education, leadership and entrepreneurship: 87 percent increased their knowledge

of science technology; 85 percent acquired strategies to enhance their ability to make good decisions; and 88 percent learned information about starting their own businesses. In reference to evaluations, clients responded to knowledge gained from educational sessions in 4-H Family Life programming.

**Key Items of Evaluation**

Participants showed significantly better knowledge after attending workshops and presentations.

Youth demonstrated increased knowledge, confidence and intention to use the skills they gained.

## 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.