2016 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 will provide background information regarding the state of Georgia and the development of the Georgia Federal Report of Accomplishments. This summary will provide background data for the state and universities, program highlights, examples of specific collaborative efforts between the University of Georgia (UGA) and Fort Valley State University (FVSU), and brief summaries for each of the eight planned programs.

BACKGROUND

Fort Valley State University and the University of Georgia address major agricultural issues, as well as many other problems facing rural and urban areas, the environment, families and youth. This accomplishment report represents the coordinated effort between the state's 1890 and 1862 institutions: FVSU and UGA. It includes joint planning between Agricultural Experiment Stations and Cooperative Extension units at both universities.

Georgia, one of the original 13 colonies, has a land area of 57,919 square miles, which makes it the largest state east of the Mississippi River (24th nationwide). Georgia falls within five major physiographic regions: 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 in the Blue Ridge Mountains.

Georgia's 2016 estimated population was 10,310,371. The U.S. Census reported 24.5 percent of Georgians were under age 18, and 12.8 percent of the state's population was age 65 or older. According to the census, 61.6 percent of Georgians identified themselves as white, 31.7 percent identified as African-American, 9.4 percent identified as Hispanic or Latino, and 4.0 percent identified as Asian. Figures exceed 100% due to persons reporting more than one area.

The state's Cooperative Extension offers programming in all of Georgia's 159 counties. FVSU and UGA county personnel are housed jointly in county offices. Extension programming in the areas of Agriculture and Natural Resources, Family and Consumer Sciences, and 4-H Youth Development is delivered as both individual county efforts and as multicounty programming. State faculty members deliver training to county agents and programming directly to clientele, when appropriate.

The research programs of FVSU and UGA are conducted through the system of Agricultural Experiment Stations. There are several campuses throughout the state. The state's four largest campuses are located in Athens, Fort Valley, Tifton and Griffin. In addition, Georgia Research and Education Centers are located strategically throughout the state.

This joint report was developed around core programs and targeted issues. The programming directions of core programs and the identification of targeted issues are decided under a structured program development system. The Georgia program development model is a multistep process that is operational

every year. The model includes a process for assessing needs and identifying problems. It also includes program evaluation to determine impact. The Georgia program development model works in unison with multiple advisory systems at both county and state levels.

The Georgia Federal Report of Accomplishments does not attempt to capture all of the work of the universities' faculty members. It is intended to document the accomplishments of faculty members receiving specific formula funds. These core programs range from traditional animal and plant production, and family and consumer skills to the emerging issue of biofuels. The goals of these programs are to demonstrate short- and long-term impacts. However, the greatest impacts of these core programs are the foundations created to support and leverage additional resources beyond state matching funds.

COLLABORATION

Bringing the resources of both universities to the table through joint participation in monthly Agriculture and Natural Resources (ANR) Extension coordination meetings, planning and information exchange provides opportunities to build a strong program for Georgians.

Besides collaborations between FVSU and UGA, researchers and Extension professionals work with a variety of outside organizations on local, state, national, and international levels. Such organizations include other universities, commodity groups, and government agencies.

FVSU and UGA increase their reach and ability to respond to Georgians' needs through a large volunteer support network, most notably Master Gardener Extension and 4-H volunteers. These volunteers log thousands of hours, adding untold value to our programs.

PLANNED PROGRAMS

Animal Production and **Plant Production** programs worked on a variety of projects to address profitability, sustainability, global food security and hunger. These programs, along with **Urban Agriculture** programs, worked to respond to the growing issues of climate variability and conservation of natural resources.

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

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

Faculty in **Food Safety** programs worked to increase and improve 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 increasing home health and homeownership. This area also covered financial planning, consumer awareness, indoor air quality, and general well-being.

HIGHLIGHTS

UGA Extension took research-based agricultural information to the people. County agents and specialists cover topics and programs including agriculture, the environment, homes, families, and 4-H youth development.

Our research scientists developed and tested new equipment, breed and grew new crop varieties, investigated new technologies, and supported fast-growing food and fiber industries.

Extension plant pathology researchers maintained plant disease clinics in Athens and Tifton to aid county Extension faculty in diagnosing and correcting disease-related plant problems. Additionally, a laboratory for analysis of nematodes was maintained in Athens. The clinics maintained a computerized database of samples and their diagnoses through the Distance Diagnostics through Digital Imaging (DDDI) system.

The health of poultry is critical to the ongoing profitability of the poultry industry in Georgia. In 2015, avian influenza caused over $1 billion in losses for the poultry industry in the U.S. Avian influenza and other diseases created product and economic losses in the poultry industry. The priority in 2016 was to collaborate with the Georgia Poultry Laboratory Network, the Georgia Poultry Federation, and poultry companies in the state to increase the implementation of biosecurity practices on farms throughout the state to prevent avian influenza and to reduce the incidence of other diseases as compared to previous years. No cases of avian influenza were noted in Georgia, and the number of cases related to other diseases, such as such as laryngotracheitis (LT), Mycoplasma gallisepticum (MG), and Mycoplasma synoviae (MS), were lower than in previous years.

Five of Georgia's top commodities by farm gate value are broilers, beef, eggs, cotton, and peanuts. These five exceed all other commodities combined. Animal agriculture is a significant component of Georgia agriculture. Unfortunately, substantial losses due to arthropod pests reduce income realized from these products. Despite over $25 million spent annually on pest management, losses in animal agriculture still exceed $50 million annually. Specialists provided pest overviews for organizations such as the Georgia Cattlemen's Association, the Georgia Pest Control Association, and Georgia Poultry Federation.

Offering food safety training in Spanish to overseas processors helped them to improve their methods of monitoring and sanitation, hopefully reducing the risk of foodborne illness in imported meats coming from South and Central America. The Poultry School en Español drew 37 attendees from Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Guatemala, Honduras, Mexico, Nicaragua, Peru and the U.S.

Georgia is one of the states experiencing an influx of immigrants. Most of these immigrants come from countries where goat meat is consumed. For instance, the Hispanic population is the fastest growing segment of the immigrant population. Over 50 percent of these Hispanic immigrants are Mexican, and they are known to eat goat meat regularly. The estimated number of recent immigrants is over 1 million. Research is expected to result in improved decision making as to whether to enter into or avoid meat goat production based on expected costs of production and profitability.

The honeybee program worked to increase humanity's knowledge of bee biology, bee management, and crop pollination, and delivered that knowledge in the most effective manner to interested users. The program strived to develop research and Extension initiatives that are locally responsive while globally relevant.

Entomology programs included insect genetics, immunology, endocrinology, systematics, basic molecular biology of insects, and the genetics and mode of action of Bt toxins and transgenic plants.

Nutrient management planning programs (NMPs) continued to have a positive impact on the environment by helping farmers develop and implement NMPs designed to protect Georgia water quality and enhance environmental stewardship efforts.

Work was done to test the efficacies of new and developing antimicrobial products for their ability to cure existing cases of mastitis and to prevent new infections in dairy cows.

The Centers for Disease Control and Prevention estimates that each year roughly one out of six Americans (or 48 million people) gets sick, 128,000 are hospitalized, and 3,000 die from foodborne diseases. Extension specialists trained agents to teach consumer food safety and food service education programs. They also developed curricula, print, online consumer resources and program evaluations. Research faculty in the Center for Food Safety and the department of Food Science and Technology work directly with CDC, FDA, the Georgia Department of Agriculture and food processing companies to identify and eliminate sources of food contamination.

The Georgia food service industry consists of more than 16,000 establishments employing 374,000 people. Most foodborne illnesses are caused by unsafe food handling practices. Cooperative Extension offered educational programs for food service managers, other restaurant employees, and food handlers in child care, institutional settings, and civic or religious organizations.

Extension specialists trained agents to provide education to adults and youth on nutrition and lifestyle choices that will reduce or control chronic disease. Specialists also developed curricula, print, online consumer resources, and program evaluations.

4-H programs, such as Food Product Development Learning Experiences, Health Rocks!, Helping Our People Eat, and Summer Camp Healthy Lifestyle, helped children learn about the importance of nutrition, physical activity, and overall wellness.

The homebuyer education program helped consumers gain the knowledge they need to become successful homeowners. This included ensuring that participants had an understanding of the buying process, mortgages, financial management, and how to prevent foreclosure and default. The program also included education in maintaining a safe, clean, and healthy home environment.

Programs were offered to promote and provide access to financial and consumer education tools and activities to assist Georgians in making decisions and choices in the areas of personal finance, saving/asset building, and credit management.

Many research projects were conducted in the area of plant production. Examples include specialty plants biotechnology, plant breeding and cultivar development, green technology, sustainable and organic vegetable production evaluation, control and integrated management of pests and diseases, nut and fruit pathology, cultivar trials, and mechanical harvesting.

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. Through research and Extension work, Extension specialists educated industry personnel on best practices.

The Sustainable Agriculture Research and Education (SARE) program promoted sustainable agriculture practices for farms and farmers.

Researchers and specialists conducted economic and market analyses of major factors and issues affecting the performance of the U.S. and international food and agribusiness industries and contributed to those industries' sustainability and prosperity.

The environmental sciences program provided leadership in research, teaching, and Extension activities

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

Georgia residents seek to grow fruits, vegetables, and ornamental plants, and they look to Extension for advice and direction. There are approximately 1.9 million acres of turf in Georgia with a maintenance value of $1.85 billion. Disease losses and control costs account for over $300 million annually. Efforts in the area of urban agriculture included the recruitment and training of Master Gardeners, equipment safety classes, the development of hardy turfgrass, landscape training, and preservation of historically significant trees of Georgia.

In one study, 19 species of Scutellaria were tested and compared with rosemary for anti-oxidant capacity. S. montana and S. ocmulgee registered much higher total polyphenol, flavonoid content than rosemary, and exhibited higher anti-oxidant capacity (TEAC) too. Five species are being traded commercially, two of them with major market share (S. baicalensis and S. lateriflora). Field production of Scutellaria herb is in progress. Moreover, Scutellaria also had positive interaction with the conventional chemotherapeutic drug temozolomide. Further studies are in progress to determine the efficacy of Scutellaria in combination with chemotherapy and immunotherapy in order to ultimately improve the clinical outcome for patients with malignant gliomas.

Regarding small ruminant research, while off-season mature multiparous does are usually stimulated and become pregnant, the younger nulliparous does get into estrus and ovulate but cannot get pregnant when stimulated during the non-breeding season. Our current research is testing several hormones including melatonin, gonadotropins and different patterns of lighting to determine the cause of infertility in the young ones in order to improve productivity of meat and milk in all does. We expect goat farmers to at least double goat milk and meat production annually using these techniques at the end of these research.

Development of value-added, nutritionally balanced and functional dairy goat products would be important for not only to provide hypoallergenic dairy foods to milk allergy patients and fat reduced healthy foods to consumers, but also promote the profitability of the dairy goat industry. The successful development of the fat reduced healthy goat milk products of this project may be important to serve consumers, stakeholders, special needy groups such as health foods seekers, cow milk allergy patients and connoisseur consumers who look for specialty goat products.

Programs for youth were abundant in 2016. Many of today's youth are denied the opportunity to learn outside and develop an appreciation for the outdoors. Jekyll Island 4-H, Rock Eagle 4-H, Wahsega 4-H, Burton on Tybee Island, Tidelands and Fortson 4-H centers give children this opportunity. Programming covered science, engineering, and technology; leadership and civic engagement; communication; livestock; environmental education; healthy relationships and bullying.

Additionally, programs were offered for families and caregivers on child development, relationships, health, and safety.

Total Actual Amount of professional FTEs/SYs for this State

Year: 2016	Extension		Research	
	1862	1890	1862	1890
Plan	280.0	13.2	202.0	41.3
Actual	420.4	26.0	203.8	12.0

II. Merit Review Process

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

- Internal University Panel

2. Brief Explanation

Supervisors have the responsibility of determining merit increases, which are related to annual performance evaluations. Throughout the year, comments from external stakeholders are noted. For county Extension faculty, particular attention is paid to county stakeholder input.

Both universities incorporated the items above in their respective merit review processes. All research projects conducted during this year were peer reviewed by both internal and external reviewers. In addition, more than 20 percent of approved research projects are also 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 the state program goals at the state, district, and county levels. Departmental Extension coordinator contacts provide insight at the state level. The program development team is the district-level input. This team consists of the district program development coordinators, evaluation specialist, 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 group meetings that 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.

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.

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

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

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 during the year. One youth development statewide survey was conducted to collect county input. The statewide College of Agricultural and Environmental Sciences advisory committee met two times during the year. In addition, college administration meets at least annually 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. All vacant positions in all departments are brought to college-level administrators for evaluation based on these criteria before a decision is made to refill or positions may be redirected as needed. The dean solicits input from all faculty, staff, and stakeholders prior to making hiring decisions on major administrative positions. County agent and staff positions are reallocated to counties of higher need and 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 to meet the needs of stakeholders, communities, and the economic and environmental sustainability of the state.

-National reputation is important provided that local needs are being addressed.

-Stakeholders are seeking a greater partnership with the college and are willing to contribute their time, talent, and resources to build the overall 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

1. Total Actual Formula dollars Allocated (prepopulated from C-REEMS)			
Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
8150158	2614965	6121739	3094871

2. Totaled Actual dollars from Planned Programs Inputs				
	Extension		Research	
	Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
Actual Formula	9039800	2614965	6767445	3094871
Actual Matching	9039800	2614965	6767445	3094871
Actual All Other	0	0	0	0
Total Actual Expended	18079600	5229930	13534890	6189742

3. Amount of Above Actual Formula Dollars Expended which comes from Carryover funds from previous				
Carryover	7211503	0	6452713	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%
	Total	100%	100%	100%	100%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2016	Extension		Research	
	1862	1890	1862	1890
Plan	12.1	2.0	9.5	6.8
Actual Paid	14.9	2.0	12.1	6.8
Actual Volunteer	0.0	0.0	0.0	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	**1890 Extension**	**Hatch**	**Evans-Allen**
1562594	726379	1567903	933265
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
1562594	726379	1567903	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, articles for the layperson, industry publications, peer-reviewed journals, scientific proceedings, state and national conferences, broadcast media, websites, and expos.

Aquaculture
The aquaculture specialist offered workshops, consulting, and business plan evaluation for commercial fish hatcheries and pond owners.

Cattle
Bull testing and heifer evaluation programs were conducted. Calf evaluation for feedlot performance and carcass evaluation in commercial feedlots occurred through the Georgia Beef Challenge.

The Master Cattlemen's Program involved in-depth educational seminars.

Research was conducted to develop genetic models to analyze livestock data, resulting in software to conduct genetic evaluations.

A trial was conducted to evaluate a cooling system that adjusts output based on temperature and humidity conditions.

Poultry
A webinar was conducted on avian influenza. Cooperative efforts succeeded in getting the message to the farmers. No commercial cases of avian influenza were reported in Georgia. There was a noticeable reduction in the number of other diseases.

Meat and Poultry
The meat and poultry Hazard Analysis Critical Control Point (HACCP) course was offered. The Poultry School en Español drew 37 attendees from Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Guatemala, Honduras, Mexico, Nicaragua, Peru and the U.S., reducing the risk of foodborne illness in

imported meats.

Equine
Talks were given on equine nutrition and multiple emails and phone calls regarding horse nutrition were answered, including consultations with veterinarians.

Swine
Studies were conducted to examine swine intake regulation. Studies examining the efficiency of nitrogen and phosphorous utilization that have the potential to reduce the environmental impact of animal agriculture will be conducted concurrently.

Small Ruminant
Faculty offered several integrated small-ruminant internal parasite management and other group workshops. Three videos were developed for the Journeyman Farmer Certificate Program (JFCP). Specialist edited several other JFCP videos and associated presentations covering nutrition, meats, marketing, parasite control, predator control, forages/pastures. USB drives with small-ruminant information were provided to staff to use with clientele.

At FVSU, the research we are currently conducting concerns evaluation of the nutritional and anti-parasitic bioactivity of different forms of sericea lespedeza (SL; Lespedeza cuneata), a high-tannin, warm-season perennial legume well adapted to Georgia's warm, moist environmental conditions.

Pests
Specialists worked with the College of Agricultural and Environmental Sciences' Georgia FACES media newswire to prepare three timely press releases for the general public on seasonal pests. Researchers updated 11 sections of the Georgia Pest Management Handbook.

Field studies of fly control methodologies were conducted.

2. Brief description of the target audience

The target audience consists of sheep, goat, beef, and pork producers; dairymen; aquaculture producers; county agents; veterinarians; industry professionals; environmental professionals; pet owners; scientific peers; government officials and policymakers; land owners; limited-resource farmers; and those living around animal agriculture environments.

3. How was eXtension used?

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

V(E). Planned Program (Outputs)

1. Standard output measures

2016	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	436829	412734	549909	519576

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

Patent Applications Submitted

Year:	2016
Actual:	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2016	Extension	Research	Total
Actual	0	31	31

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
2016	78

Output #2

Output Measure

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

Year	Actual
2016	36

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
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2016	110

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 as well as become informed of new technologies as they are developed.

What has been done
The University of Georgia Beef Team currently offers the Master Cattlemen's Program. This program involves detailed, in-depth educational seminars related to beef cattle.

Results
There were 110 participants in the Master Cattlemen program in 2016.

4. Associated Knowledge Areas

KA Code	Knowledge Area
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

Year	Actual
2016	390

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Livestock production counts for the largest portion of agriculture in Georgia.

What has been done
Specialists and agents delivered crucial, research-based information to farmers and producers.

Results
Livestock and aquaculture value decreased by $390,096,829, a reduction of about 17 percent.

4. Associated Knowledge Areas

KA Code	Knowledge Area
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

Year	Actual
2016	5558

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 industry.

What has been done
A survey of Georgia?s Cooperative Extension county agents and commodity specialists was conducted for the purpose of providing annual, county-level information for the value of poultry production.

Results
The farm gate value for poultry was $5,558,773,858, an increase of 0.63 percent.

4. Associated Knowledge Areas

KA Code	Knowledge Area
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
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

Brief Explanation

Some external factors included the environment, temperature, and farm management.

The health of poultry is critical to the ongoing profitability of the poultry industry in Georgia. In 2015, avian influenza caused over $1 billion in losses for the poultry industry in the U.S. That and other diseases created product and economic losses in the poultry industry. The priority in 2016 was to collaborate with the Georgia Poultry Laboratory Network, the Georgia Poultry Federation, and poultry companies in the state to increase the implementation of biosecurity practices on farms throughout the state to prevent avian influenza and reduce the incidence of other diseases as compared to previous years.

As anticipated, agriculture-urban intersections have produced unique challenges, and expanding metro areas continue to strain those situations. Novice cattlemen are attending the Master Cattlemen training, getting good starts on their operations and making connections with their county agents and experienced cattlemen. The loss of registered insecticides further limits control options available to producers.

New Food Safety Modernization Act (FSMA) regulations for Food and Drug Administration (FDA)-covered commodities have limited Hazard Analysis Critical Control Point (HACCP)-based training in favor of new FDA-approved curricula. Meat and poultry HACCP will continue to be updated as new regulations are issued.

Due to heat and humidity typical of the southeastern U.S., which negatively affects milk yield and milk quality, there was a high demand for educational programs on how to properly manage heat stress in dairy cattle to improve milk production, control mastitis, and lower somatic cell counts in milk.

Drought and other climate factors have placed demands on pond managers who seek technology assistance and diagnostic services. Aquaculture farms have faced high feed costs and competition from imported commodities, so they are looking for local feed and markets in order to sustain or expand their operations.

The market price for cattle was volatile during 2016. This forced beef cattle producers to pay close attention to all aspects of management to maintain economic viability.

Due to historic drought, most producers in Georgia depended on supplemental forage and

feed to maintain their economic livelihood. Development of nutritional plans to maintain animal performance became a priority.

Horse owners have limited knowledge on who to contact for information regarding nutrition and pasture management. Speaking to small groups at the county level has improved communication between UGA and the general horse industry over the past few years, leading to a greater demand for information. The horse industry fluctuates greatly with the economy.

Drought prevented some demonstration and incorporation of forage programming. Funding and time resources competing with public and programmatic priorities delayed some programming and impacted resources for farmers (i.e., cost-share programs with the U.S. Department of Agriculture (USDA)). The demand for small-ruminant products continues to increase, which helps to support farm profitability.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

No cases of avian influenza were noted in Georgia. In addition, the number of cases related to other diseases, such as laryngotracheitis (LT), Mycoplasma gallisepticum (MG), and Mycoplasma synoviae (MS), were lower than in previous years.

Citizens continue to submit arthropods for identification through mail, through the Distance Diagnostics through Digital Imaging (DDDI) system, and through photographs via email.

Post-workshop evaluations are either given to the participants (HACCP) or completed online.

Multibreed models have been successfully developed and implemented, and are being applied in more than 10 U.S. breed associations.

Contacts rose following a case study of the Sunbelt Exposition Fish Pond Area after upgrades in 2015 and 2016. Over 500 cases, covering the topics of aquatic weed control, algae toxin management, fish disease control, hydrology, pond construction and maintenance, and fish population management, were served at the Tifton location. The value of aquatic diagnostics and control recommendations exceeded $3 million in 2016.

Evaluations from the Georgia HERD and Master Cattlemen's programs indicated that over 95 percent of participants were satisfied. Additionally, all indicated that these programs helped them make improvements in the genetics and overall management of their herds.

In the AWARE program, following the annual certified operator/planner class, a test was given and all participants passed with a score of 70 percent or higher.

Companies and breed associations in the beef cattle, dairy cattle, poultry, sheep, and swine industries have used the developed methodologies, which combine genomic and phenotypic information for the purpose of genetic evaluation. Also, the fish industry is currently working with scientists to develop procedures for use in this industry.

In the pilot for the Journeyman Farmer Certificate Program small-ruminant section, there

were 22 first-session participants. Of the 19 responding to paper surveys, all indicated that they increased their knowledge after the training. An average of 81 percent agreed that the learning experience overall was adequate, 83 percent agreed communication was satisfactory, and 84 percent were satisfied with structure and organization.

Key Items of Evaluation

The number of cases related to poultry diseases such as laryngotracheitis (LT), Mycoplasma gallisepticum (MG), and Mycoplasma synoviae (MS) was lower than in previous years.

Multibreed models have been successfully developed and implemented, and are being applied in more than 10 U.S. breed associations.

Evaluations indicated that over 95 percent of the participants were satisfied with the programs they attended.

Collaborative efforts with industry organizations yielded positive results.

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%
	Total	100%	100%	100%	100%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2016	Extension		Research	
	1862	1890	1862	1890
Plan	2.5	0.3	2.0	9.8
Actual Paid	3.1	0.2	2.1	9.8
Actual Volunteer	0.0	0.0	0.0	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	**1890 Extension**	**Hatch**	**Evans-Allen**
322850	90797	268018	1338137
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
322850	90797	268018	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, articles for the layperson, industry publications, peer-reviewed journals, scientific proceedings, state and national conferences, broadcast media, websites, and expos.

Faculty provided food safety classes, including ServSafe®, 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 by Extension agents to media outlets.

In 2016, a new Food and Drug Administration (FDA)-approved curriculum for the Preventive Controls Rule of the Food Safety Modernization Act (FSMA) was released, allowing participants to become Preventive Controls Qualified Individuals (PCQI) to provide guidance to companies under FDA regulations. This curriculum replaced our Hazard Analysis Critical Control Point (HACCP)-based risk assessment training programs for the fresh-cut produce and nuts industries. Three faculty members are certified as lead instructors in this curriculum. A total of 86 individuals from 47 companies received PCQI certification in three 2016 workshops.

Faculty continued to lead the meat and poultry HACCP workshop in April, with 16 individuals from 13 companies from Georgia as well as around the country earning HACCP certification. All of these workshops will be offered again in 2017. A total of 254 individuals from 99 companies (43.6 percent in Georgia) attended the eight HACCP workshops offered by Extension food science in Athens.

Infestation of harvested peanuts by post-harvest moth pests is a real threat. Deployment of the parasitoid, Habrobracon hebetor, will be excellent at managing residual populations of the pest. Our research has demonstrated that H. hebetor can be reared on diapausing larvae of the Indian meal moth and released to inundate warehouses.

FVSU research showed that H. hebetor, a parasitoid that attacks lepidopteran pests in storage can be reared in mass on diapausing larvae of the host in the laboratory. The use of this biological control agent will be particularly beneficial to the "Organic Food Industry".

Entomopathogens, nematodes and fungi were investigated along with insecticides for the control of the burrower bug. A combination of the entomopathogenic nematode (Heterorhabditis bacteriophora Oswego)

and the insecticide, chlorpyifos, was found to be effective in significantly causing mortality of the burrower bug compared with the nematode or insecticide alone; the interaction between nematodes and chemical insecticide was synergistic. Field tests results were consistent with laboratory results.

2. Brief description of the target audience

The target audience for this program includes food industry managers, food service professionals, quality assurance professionals, Hazard Analysis Critical Control Point (HACCP) coordinators, microbiologists, third-party auditors, government inspectors, and county Extension agents.

3. How was eXtension used?

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

V(E). Planned Program (Outputs)

1. Standard output measures

2016	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	63477	334747	30107	158768

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

Patent Applications Submitted

Year: 2016

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2016	Extension	Research	Total
Actual	0	5	5

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

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

Year **Actual**

2016	10

Output #2

Output Measure

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

Year	Actual
2016	41

Output #3

Output Measure

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

Year	Actual
2016	16

Output #4

Output Measure

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

Year	Actual
2016	589

Output #5

Output Measure

- Food Preservation website number of files viewed

Year	Actual
2016	4982156

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.

Outcome #1

1. Outcome Measures

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

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2016	20

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The Centers for Disease Control and Prevention estimates that, each year, roughly one out of six Americans (or 48 million people) gets sick, 128,000 are hospitalized, and 3,000 die from foodborne diseases.

What has been done
Extension specialists trained agents to teach consumer food safety and food service education programs.

Results
Twenty percent of participants showed an increase in their knowledge of food safety, an increase of 20 percent from last year.

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 Naturally Occurring Toxins

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

Year	Actual
2016	27

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Food handlers require ongoing training to stay abreast of the latest information in food safety science.

What has been done
ServSafe® 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
Twenty-seven percent of participants were repeat attendees.

4. Associated Knowledge Areas

KA Code	Knowledge Area
501	New and Improved Food Processing Technologies
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins
723	Hazards to Human Health and Safety

Outcome #3

1. Outcome Measures

Number of agents increasing 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
2016	227

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The Economic Research Service (ERS) estimates the cost of foodborne illness from five foodborne illnesses alone at $6.9 billion per year. In recent years, Georgia had the highest incidence of salmonellosis of all 10 sites monitored by the Centers for Disease Control and Prevention?s FoodNet system.

What has been done
Extension specialists trained agents to teach consumer food safety and food service education programs. Specialists also developed curricula, print and online consumer resources, and program evaluations.

Results
Of agents attending training, 227 demonstrated an increase in knowledge about teaching food safety to clientele, an increase of 171 from last year. Those agents then provided training to food service industry professionals.

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 Naturally Occurring Toxins
723	Hazards to Human Health and Safety

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

External factors impacting this program include the implementation of the Food Safety Modernization Act, which has changed requirements for ServSafe® training programs. Severe weather prompted contributions that were created in response to Hurricane Matthew to a new website.

Hazard Analysis Critical Control Point (HACCP) training will still be offered for the meat and poultry industry. The new Preventive Controls Qualified Individuals (PCQI) and Produce Safety Alliance (PSA) curricula that have been approved by the Food and Drug Administration under the Food Safety Modernization Act (FSMA) have been incorporated into the 2016 workshop schedule for the fresh produce, fresh-cut produce and nut industries.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Agent knowledge was assessed by written tests at in-service trainings. New evaluation tools were developed for new programs.

New pre- and post-workshop questionnaires have been developed for the PSA and Preventive Controls Qualified Individuals (PCQI) training. The results of these questionnaires are shared with the instructors following the program. A post-workshop evaluation is done for the Meat and Poultry Hazard Analysis Critical Control Point (HACCP) workshop.

We have successfully demonstrated that diapausing larvae support more progeny production by the wasp. It has also been shown that the wasp has excellent search ability

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%
	Total	100%	100%	100%	0%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2016	Extension		Research	
	1862	1890	1862	1890
Plan	3.0	0.0	1.0	0.0
Actual Paid	3.7	0.5	3.6	0.0
Actual Volunteer	0.0	0.0	0.0	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	**1890 Extension**	**Hatch**	**Evans-Allen**
387420	0	469031	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
387420	0	469031	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 was shared via bulletins, newsletters, eXtension, articles for the layperson, 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 were disseminated on weight control, physical activity, diabetes management and prevention, cardiovascular disease prevention, and cancer prevention. Training and education about chronic disease prevention and control were provided to agents and selected clientele. Information on chronic disease prevention, healthy eating, and physical activity was provided to agents and media outlets to be disseminated to the general population.

A researcher had the opportunity to talk with local farmers market supervisors and local farmers to understand their perspectives and thoughts on how to reach out to consumers about local food. Also, a thorough evaluation of marketing and advertising efforts about current messaging strategies, and current media channels being used for communicating to consumers about local food was conducted. The thoughts of the farmers market supervisors and farmers are being included in research, building upon current trends in the advertising and marketing of local foods.

Research relating to goats was conducted in an effort to provide consumers with alternative meat and dairy products that are healthier, safe, and superior in palatability.

Research was conducted to assess the effects of feeding lactating goats newly developed rumen-escape dietary supplements (REDS) that contain fish oil in chemically treated protein. The research examined fatty acid compositions and alpha-Tocopherol concentrations of blood serum and milk, as well as milk composition. Findings from this research indicate that feeding lactating goats newly developed REDS can protect omega-3 fatty acids from ruminal degradation, subsequently increasing omega-3 fatty acids in the blood serum and milk of lactating goats.

Specialists conducted in-school classes in a majority of Georgia's counties. Faculty conducted a Food Product Development contest and local practice sessions; 4-H Food Showcase, local contests, and practice sessions; 4-H Food Challenge, local contests, and practice sessions; 4-H Yoga for Kids training; Health Rocks! on the state, county, and local levels, and Health Rocks! training for action leaders who will assist in conducting the program; Less Stress on the Test on the state, county, and local levels; and county 4-H food recipe contests (MilkMake, Peanutrition) as well as state and regional 4-H food contests (Cornbread Cookoff, 4-H Pantry Pride Contest, Fair Food Preparation contests). The statewide Fall Forum and State 4-H Council workshops focused on Healthy Living. Healthy Living ambassadors will be trained during Senior 4-H Camp and will conduct activities in counties. 4-H Healthy Lifestyle classes were conducted at summer camp, as well as bullying prevention programming, teen safety programming, teen sleep programming, and other social and emotional trainings as needed for Georgia 4-H youth.

2. Brief description of the target audience

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

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

3. How was eXtension used?

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

V(E). Planned Program (Outputs)

1. Standard output measures

2016	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	280367	1010896	534450	1927019

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

Patent Applications Submitted

Year:	2016
Actual:	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2016	Extension	Research	Total
Actual	0	9	9

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
2016	8

Output #2

Output Measure

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

program.

Year	Actual
2016	29

Output #3

Output Measure

- Website hits for diabetes, weight control, and cardiovascular disease.

Year	Actual
2016	3548

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Percent of people at risk for cancer who chose a lower fat or lower sodium food item.
2	Percentage of participants that lose weight or improve fitness.

Outcome #1

1. Outcome Measures

Percent of people at risk for cancer who chose a lower fat or lower sodium food item.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2016	75

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Dietary choices affect the development of an estimated 20 to 40 percent of cancers. Eating more fruits and vegetables, drinking more fluids, eating more whole grains, consuming more nonfat and low-fat dairy foods and being more physically active may help reduce the risk for numerous cancers.

What has been done
Extension specialists trained agents to provide training to adults and youth on nutrition and lifestyle choices that will reduce or control chronic disease. Specialists also developed curricula, print and online consumer resources, and program evaluations.

Results
Seventy-five percent of participants indicated an intention to choose lower-fat foods or to season with herbs and spices instead of salt.

4. Associated Knowledge Areas

KA Code	Knowledge Area
724	Healthy Lifestyle

Outcome #2

1. Outcome Measures

Percentage of participants that lose weight or improve fitness.

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2016	83

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
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, which also contributes to these chronic diseases.

What has been done
Extension specialists trained agents to provide training to adults and youth on nutrition and lifestyle choices that will reduce or control chronic disease. Specialists also developed curricula, print and online consumer resources, and program evaluations.

Results
Eighty-three percent of participants lost weight or improved fitness.

4. Associated Knowledge Areas

KA Code	Knowledge Area
724	Healthy Lifestyle
802	Human Development and Family Well-Being

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Economy
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Populations changes (immigration, new cultural groupings, etc.)

Brief Explanation

Federal, state, and private funding sources have been decreasing. This impacts how many new materials, trainings, and programs specialists and agents can provide.

Also Medicare, Medicaid, and private health insurance benefits have been fluctuating, so access to care may prevent some individuals from implementing self-care and lifestyle recommendations.

Natural disaster damage occurring during this year in south Georgia may have decreased the number of programs agents could provide.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Overall, participants rate our programs high in helpfulness for thinking about and implementing health behavior changes associated with prevention of seven of the 10 leading causes of death in the U.S. (Participants rated Cancer Prevention Cooking School 4.7 out of 5.)

Of the 242 participants who completed Cancer Prevention Cooking School programs, more than 65 percent indicated they were very or extremely likely to control their weight, fill half their plate with fruits and vegetables, eat less red meat, and avoid processed meat. Following the program, 75 percent of women indicated they were definitely going to get cervical cancer screenings, 80 percent indicated they would get a mammogram, and 67 percent indicated they would definitely get a colonoscopy.

Over 80 participants completed diabetes education classes as part of the Rite Bite Diabetes Cooking School and provided evaluation data. Highlights from the retrospective pre- and post-evaluations indicate statistically significant improvements (all $P < 0.05$) in several diabetes self-management behaviors, such as "Checking my blood glucose two hours after a meal," "Cutting the sugar in recipes by at least one-fourth," and "Use the nutrition label to choose foods lower in saturated and trans fats." Pre- and post-evaluation data from the DEEP diabetes program indicated participants made statistically significant (all $P < 0.05$) improvements in knowledge of diabetes self-management behaviors and attitudes about managing diabetes, such as how exercise helps blood sugar (an increase in knowledge of 47 percent of participants), the best way for people with diabetes to take care of their feet (an increase of 22 percent), that carbohydrates break down to glucose in the body (an increase of 18 percent), and knowing healthy ways to handle the stress related to diabetes (an increase of 126 percent).

DEEP participants also reported statistically significant improvements (all $P < 0.05$) in diabetes self-management behaviors, such as the number of days per week in which they exercised 30 minutes or more, the number of days per week that they tested their blood sugar, and the number of days per week that they ate five or more servings of fruits and vegetables.

Through attending an international event about food sustainability, practices, and culture, a faculty member presented new thoughts on how to evaluate the importance of local food within the U.S. That research led to discussions with farmers market supervisors and farmers in order to understand their perspectives on what to communicate with consumers about the importance of buying local food.

Key Items of Evaluation

Overall participant ratings were good for health and nutrition classes.

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%
	Total	100%	100%	0%	0%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2016	Extension		Research	
	1862	1890	1862	1890
Plan	4.8	1.8	0.0	0.0
Actual Paid	5.9	1.5	0.0	0.0
Actual Volunteer	0.0	0.0	0.0	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	**1890 Extension**	**Hatch**	**Evans-Allen**
619872	635582	0	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
619872	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

The apparel and textiles program was implemented through group discussions, workshops, demonstrations, and training supplemented by print and electronic media resources. "Preparing for the Workforce" publications were developed and distributed to educate clients seeking employment.

Programs in financial management and family resource management were implemented to strengthen limited-resource families and communities to enhance their quality of life.

Extension specialists provided a total of 40.5 hours of training in 12 sessions for 130 county Extension agents. In 2016, agents reached 15,130 Georgians through more than 500 programs in 110 counties.

Homebuying and financial management workshops were conducted, along with some individual housing counseling sessions. An online homebuyer program was added as an option for individuals seeking to purchase a home.

Educational resources were provided to Extension agents and distributed through programs and media outlets about indoor air quality (IAQ) and how to reduce exposure to IAQ contaminants in home, work, and school environments.

2. Brief description of the target audience

Specialists will direct efforts primarily to county agents. As a result, agents will reach youth, parents, senior citizens, homebuyers, families, and others.

The targeted audiences of the FVSU faculty will be Georgians and residents in surrounding areas with emphasis on limited-resource and low-income families and individuals.

3. How was eXtension used?

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

V(E). Planned Program (Outputs)

1. Standard output measures

2016	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	210794	1046968	392288	1948402

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

Patent Applications Submitted

Year:	2016
Actual:	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2016	Extension	Research	Total
Actual	2	0	2

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
2016	28

Output #2

Output Measure

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

Year	Actual
2016	5

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 percentage of participants who indicated a change in behavior, such as conserving water, purchasing Energy Star products or testing their well.
3	The number of participants who tested their homes for indoor air quality contaminants as a result of the educational programs conducted by county agents.
4	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 percentage of participants who indicated a change in behavior, such as conserving water, purchasing Energy Star products or testing their well.

Not Reporting on this Outcome Measure

Outcome #3

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

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2016	630

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. 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 (IAQ) programming to target populations, teaching consumers how to reduce exposure to IAQ contaminants in home, work,and school environments. Specialists also developed curricula, print and online consumer resources, and program evaluations.

Results
A total of 630 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 is up 21 percent from last year.

4. Associated Knowledge Areas

KA Code	Knowledge Area
607	Consumer Economics
723	Hazards to Human Health and Safety

Outcome #4

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

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2016	80

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Indoor air quality (IAQ) 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. 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 (IAQ) programming to target populations, teaching consumers how to reduce exposure to IAQ contaminants in home, work,

and school environments. Specialists also developed curricula, print and online consumer resources, and program evaluations.

Results

Eighty 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
723	Hazards to Human Health and Safety

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
- Populations changes (immigration, new cultural groupings, etc.)

Brief Explanation

The economy is slowly recovering, but many Georgians struggle to make ends meet. Georgia had twice as many bankruptcies as the national average and climbed to No. 3 behind Tennessee and Alabama. Helping Georgians to spend less than they earn, decrease debt, and increase savings are program priorities.

Growth in the economy at state and national levels positively impacts economic well-being.

The housing market in Georgia is improving. There is still a need for information and resources on homebuying and maintenance.

Natural disasters impacted the number and type of educational programs delivered in some areas of the state.

Indoor contaminants continue to be a health problem. In recent years, radon in water has emerged as a health concern in Georgia.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

End-of-workshop surveys from selected programs indicate that financial knowledge increased. Participants were significantly more likely to say they planned to use a written spending plan, contact creditors about late payments, pay bills on time, and put money in savings before paying for other expenses. Better than 98 percent of participants reported that the topics covered in the workshop were helpful, learning materials and handouts were

helpful, the content of the course was easy to understand, and that they learned something they could use.

Eleven estate-planning presentations ranging from one to one-and-a-half hours were provided as part of Teachers Retirement System of Georgia (TRSGA) pre-retirement seminars, Annie's Project, and as individual sessions from county Extension agents to individuals and families from approximately 25 Georgia counties. Based on the data obtained at some of the presentations, the majority of participants' knowledge of property transfer, wills, powers of attorney, and living wills increased. In addition, the majority of participants planned to create and/or revise wills, powers of attorney, and living wills.

Surveys are conducted at the end of the in-person and online classes. Overall the classes were deemed informative.

Key Items of Evaluation

Overall, participants rated programs well and indicated a change 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%
	Total	100%	100%	100%	100%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2016	Extension		Research	
	1862	1890	1862	1890
Plan	22.5	0.0	26.5	2.0
Actual Paid	27.6	0.0	22.5	2.0
Actual Volunteer	0.0	0.0	0.0	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	**1890 Extension**	**Hatch**	**Evans-Allen**
2905650	0	2921392	274490
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
2905650	0	2921392	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. Field days, on-site visits, tours, and hands-on sessions took place. Diagnostic services were provided.

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

Researchers developed new cultivars.

Vegetables
More than 35 research/demonstration projects were completed. The Georgia Pest Management Handbook was updated to reflect changes in labels and recommendations.

Fruits and berries
We have developed a seed treatment strategy for bacterial fruit blotch of watermelon.

A unique peach and intercropping orchard, a 2.5-acre area surrounded with metallic fencing, with four gates for entrance and safety purposes, was developed. A well has been installed for independent irrigation.

Research was carried out in the field on experimental farms and in collaboration with commercial producers. Results were utilized to develop grants for commodity groups and other sources.

We set up thinning trials in different peach varieties representative of peach production in Georgia. We established a germplasm collection of 180 varieties and advanced breeding for evaluation.

Several blueberry plant growth regulators were evaluated over multiple years and on multiple varieties to determine their efficacy in detaching fruit. RNA sequencing has been used to identify changes in gene expression in response to the application of these growth regulators.

Long-term field studies and greenhouse experiments have been completed to determine the extent of damage to blueberries caused by replant disease.

Pecans

Fourteen new selections from our breeding programs were added to the selections in the trial program. Research was conducted to evaluate the risk of resistance to QoIs fungicides.

Row crops

We continue to focus on risk and management of risk associated with integrated pest management (IPM) programs. We validated that model on 59 production fields in 21 counties.

Ornamentals

Long-term projects to incorporate disease resistance have been initiated. Wheat projects focus on resistance to stripe rust and fusarium head blight. Soybean projects are focused on resistance to soybean rust, frogeye leaf spot, and stem canker. Projects combine greenhouse disease phenotyping with annual field trials.

Forestry

The FVSU Landowner Initiative for Forestry Education (LIFE) program sponsored three workshops throughout the year. Over 75 small and/or limited-resource landowners received information on sustainable forest management practices and estate planning.

2. Brief description of the target audience

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

3. How was eXtension used?

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

V(E). Planned Program (Outputs)

1. Standard output measures

2016	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	672481	8563480	30902	393508

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

Patent Applications Submitted

Year:	2016
Actual:	10

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2016	Extension	Research	Total
Actual	0	294	294

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.

Year	Actual
2016	226

Output #2

Output Measure

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

Year	Actual
2016	140

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

Year	Actual
2016	97360

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 97,360 samples.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
204	Plant Product Quality and Utility (Preharvest)
211	Insects, Mites, and Other Arthropods Affecting Plants
212	Diseases and Nematodes Affecting Plants
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
- Populations changes (immigration, new cultural groupings, etc.)

Brief Explanation

Bad weather at some research stations damaged the carpet, trees, and irrigation system and delayed this project's activities.

The irrigation pump and irrigation lines were damaged due to bad weather when winds blew the carpet and damaged upright irrigation lines. Wind and drought affected the plants, killed several young peach trees from the orchard, and decreased the total number of peach trees from 1,200 to 896.

There has been an increase in blueberry rust due to warmer winters. Drought conditions affect planting acreage and the presence of disease.

In this past year, an extreme drought was present in parts of Georgia throughout the year. Although this affected the growth and planting of new trees, it also provided additional support for our project. In our experimental plot, trees that were irrigated since planting are at least twice the size of trees that were not irrigated. This is a great demonstrative effect of our project.

Lack of sufficient low temperatures during winter leading to low chilling accumulation was encountered.

Not enough field space was available.

Environmental conditions contributed to severe problems with silverleaf whiteflies in fall vegetables. Introduction of viruses vectored by this pest magnified the issue to an unmanageable level.

Regulatory issues (the potential loss of chlorpyrifos insecticide and pollinator protection issues) also resulted in shifts in research priorities and management approaches.

Economic conditions, commodity prices, weather conditions, and agricultural regulations all impacted several projects.

Availability of extramural support has affected the ability to conduct research in this area. Additionally, field conditions negatively impacted our ability to repeat our trials.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Evaluation of this research project was done through the successful selection of a biotic/abiotic stress-tolerant peach tree suitable for middle Georgia, the success of in vitro organogenesis/somatic embryogenesis protocol development on peach germplasm, and the effects of best management practices (BMP) and intercropping on peach trees.

The program utilized statistically valid data collection and experimental approaches to develop needed technology.

Multilocation field studies were used to assess diseases of wheat and soybeans. Locations include Plains, Bledsoe, and Calhoun, Georgia, research farms.

Reports about the use of plant growth regulators were submitted to the peach growers. This report contains a three-year study with encouraging results. The use of gibberellic acid (GA3) and aminoethoxyvinylglycine (AVG) maintained fruit firmness and quality in treated plots.

The first year of data for the irrigated and fertilized plots is being analyzed currently.

Growth regulators were successful in detaching fruit. However, fruit detachment included the pedicel. This required further de-stemming to enable effective fruit harvest.

Evaluation of program objectives has been performed. It was found that growth regulator applications invariably result in fruit detachment including a pedicel. Hence, suitable de-stemming procedures will be needed if growth regulators are to be used for blueberry mechanical harvesting.

We continue to estimate losses and control costs for insect pests in cotton. We continue to annually treat cotton less than three times for insect pests.

Based on grower input, greater emphasis was placed on cowpea curculio and potential replacements for chlorpyrifos insecticide in 2016. Evaluation of products meant for silverleaf whitefly also remains an emphasis.

Percentages of knowledge gained on forest management and estate planning increased through the LIFE Program.

There is new information on how watermelon seeds become infected with Acidovorax citrulli. However, there are still very few options to prevent seed infection and mitigate the impacts of seedling disease transmission.

A more detailed understanding of the biology of seed infection and seed-to-seedling transmission of bacterial fruit blotch (BFB) have revealed possible avenues for improved seed treatment strategies for BFB management.

Gene expression profiling revealed a potential role of sulfur starvation in plant immunity.

A peptide was identified from casein with anti-immune activity that will help us understand immunity action.

The bacterial secondary messenger compound cdiGMP was found to have an important role in helping bacteria evade immune detection.

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.

Limited-resource landowners and farmers showed an increase in knowledge after workshops.

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	40%	40%	40%	40%
403	Waste Disposal, Recycling, and Reuse	30%	30%	30%	30%
605	Natural Resource and Environmental Economics	30%	30%	30%	30%
	Total	100%	100%	100%	100%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2016	Extension		Research	
	1862	1890	1862	1890
Plan	16.7	0.2	7.5	4.0
Actual Paid	20.5	1.2	7.7	4.0
Actual Volunteer	0.0	0.0	0.0	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	**1890 Extension**	**Hatch**	**Evans-Allen**
2156638	435828	1005066	548979
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
2156638	435828	1005066	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

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, articles for the layperson, industry publications, peer-reviewed journals, scientific proceedings, state and national conferences, broadcast media, websites, and expos.

A core collection of cultivars was established at the Durham Farm in Oconee County, Georgia. Liners delivered to a commercial operation in Morgan County, Georgia, were grown out and evaluated. An oil press from Germany was purchased to conduct research on oil yield from seeds. Annual data was collected on the core collection at the UGA Tifton Campus.

The ultimate goal of this program is to protect and enhance the natural resources on which the human civilization depends for food, clean water, and clean air. Extension outputs to improve public understanding of environmental management consisted of bulletins, flyers, short courses, meetings, and web pages related to implementation of environmental management programs.

Upon completion of several recent grants that allowed us to bring the water sensor technology to nursery growers, we are seeing adoption of the technology of computer-controlled irrigation monitoring and irrigation itself. The growers are most impressed with the crop quality improvement and the labor savings.

The team established seven demonstration projects at greenhouses, and held grower meetings at these sites for multicounty clusters of producers to see first-hand how the systems work. Preliminary trainings were held on site to show participants how easy it is to set up a system. Over a dozen national trainings/seminars/large-audience industry talks were given in 2015- 2016. Several trade journal articles were published with an average readership of 22,000.

We have conducted on-farm trials in Georgia greenhouses and nurseries to test more efficient irrigation methods.

Life cycle assessment of producing energy crop pellets for combustion application could reduce up to 80% of GHG emissions over coal.

Capacity of the FVSU to conduct research is expanded to new area of Nanotechnology. Protocols for extraction and characterization of cellulose nanocrystals (CNC's) are successfully completed in an effort to develop value added product from waste bagasse of energycane for sustainable bioenergy production system.

Published a high-density linkage map in pearl millet which is the dense linkage map so far in pearl millet research community. FVSU is given sub-contract from Areawide Pest Management Project of the USDA, one of its kind shared among five states of the southeast and FVSU is one of the sites to monitor aphid population dynamics and damage on sorghum plants and identify best pest management strategies.

2. Brief description of the target audience

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.

Poultry producers continue to look for ways to lower their energy bills by improving energy efficiency. UGA faculty have continued to provide audits, educational programs, and individual advice on how best to accomplish these goals. A continuing education program is carried on to train producers and poultry company personnel how to choose energy-efficient equipment and how to operate it efficiently to achieve the desired results. Also, faculty have provided a number of energy-efficiency audits for individual farms, showing how much energy efficiency can save them.

3. How was eXtension used?

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

V(E). Planned Program (Outputs)

1. Standard output measures

2016	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	210563	500394	212415	504794

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

Patent Applications Submitted

Year:	2016
Actual:	2

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2016	Extension	Research	Total
Actual	0	244	244

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
2016	79

Output #2

Output Measure

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

Year	Actual
2016	89

Output #3

Output Measure

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

Year	Actual
2016	325

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
2	Number of local demonstration testing with an assessment of economic impacts of the technology changes.

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

Outcome #2

1. Outcome Measures

Number of local demonstration testing with an assessment of economic impacts of the technology changes.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2016	6

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Most greenhouses are located near metropolitan areas, and hence utilize the same water resource base as most urban communities. With water conservation a major issue within most urban communities, greenhouse operations must now implement water conservation measures, and adapt new technology.

What has been done
Specialist provided opportunities for greenhouse owners to learn about water management and new technology that aids in water management for greenhouses.

Results
A total of six demonstration testings were conducted.

4. Associated Knowledge Areas

KA Code	Knowledge Area

403 Waste Disposal, Recycling, and Reuse

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Populations changes (immigration, new cultural groupings, etc.)

Brief Explanation

Georgia's water wars with Florida and Alabama are still not resolved, but we saw a greater awareness among growers that water is a commodity that must be conserved and managed. This is slowly driving technology adoption and management change at the managerial level and better training for lower-level employees.

Natural disasters impacted outreach and information provided related to energy and water.

Drought conditions continue to be a challenge to Georgia's agriculture. As a result, increasing irrigation efficiency continues to be an important issue.

Sagging energy prices have reduced the demand and interest in energy conservation, although demand still exists. Also, a large number of old, inefficient houses have either been upgraded or taken out of service.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Tea oil camellia can be grown for oil production in the southeastern U.S. Yields of fruit per plant often exceed that of plants being grown commercially in China. Elite cultivars can be propagated from cuttings or micrografts. The oil is high in oleic acid, which is beneficial for health. The smoke point temperature is about 40 degrees greater than olive oil, making tea oil a better choice for frying. Tea oil can also be used to make biodiesel fuel.

We are in the process of finishing up the projects and collecting the evaluations.

Growers around the U.S. have shown much interest in the automated irrigation system that has been developed and tested. This system is now becoming commercially available and the true success of the project will be clear once we know how many growers adopt this technology.

Each educational program is evaluated by participants. Responses to evaluations indicate a very positive and appreciative audience.

Key Items of Evaluation

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

Research results were positive for biofuels and other crops.

Producers indicated an intention to 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%
	Total	100%	0%	100%	0%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2016	Extension		Research	
	1862	1890	1862	1890
Plan	2.0	0.0	4.0	0.0
Actual Paid	2.4	0.0	4.1	0.0
Actual Volunteer	92.1	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**
258280	0	536035	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
258280	0	536035	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 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, articles for the layperson, industry publications, peer-reviewed journals, scientific proceedings, state and national conferences, broadcast media, websites, and expos.

The genetic screening of native plant has become a new priority. The objective is to develop landscaping plants that have ecological, as well as economic, benefits.

A student-run garden, UGArden, was further developed and programs expanded in areas of adults (primarily Master Gardeners), college students (expansion of courses and volunteer opportunities), and youth (Experience UGA and Athens Area Home School Gardening Experience).

Additionally, 499 turfgrass diagnoses, disease management for physically and distantly diagnosed disease samples, as well as a total of 589 turfgrass nematode samples were submitted through the nematode assay system and have been analyzed, processed, and recommendations given to the clientele.

Sixteen site visits, as requested by county agents and Georgia stakeholders, were performed. It is not uncommon to answer four to five calls a day on diagnosis and control of turfgrass diseases. Other efforts included attending and delivering information to underrepresented clientele and in bilingual format.

Several innovative programs were implemented. Examples include the generation of an iBook, computer-based trainings for industry personnel, full-day workshops for the Golf Course Superintendents Association of America, bilingual publications and safety training workshops.

Georgia's Master Gardener program trained a total of 380 new Master Gardener Extension Volunteers (MGEVs) who completed the 42 hours of classroom time. There were 2,445 active Master Gardeners returning. Agents and specialists were involved in teaching the training classes throughout the state.

A total of 191,654 volunteer hours were logged this year in support of Extension-approved projects. While volunteering at the local office, MGEVs answered requests from the public for horticultural advice and information at the Ask-a-Master-Gardener Help Desk. MGEVs are a tremendous help greeting those who call or come into the office with questions or samples. Answering the question on the phone or speaking

with someone who has come to the office may involve research. MGEVs may also staff plant clinics, a mobile version of the help desk that is set up in the community at locations like a farmers market or retail store. MGEVs answer questions, diagnose homeowner plant problems, accept soil samples, and provide UGA Extension resources. Through this service opportunity, MGEVs represent the university and share environmentally sound horticulture practices with the community.

2. Brief description of the target audience

The target audience for this planned program includes professional from urban agriculture industries, public policymakers 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, 142 Georgia experts answered 792 questions in eXtension.

V(E). Planned Program (Outputs)

1. Standard output measures

2016	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	181686	12717972	7872	551041

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

Patent Applications Submitted

Year:	2016
Actual:	5

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2016	Extension	Research	Total
Actual	0	40	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
2016	19

Output #2

Output Measure

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

Year	Actual
2016	28

Output #3

Output Measure

- Number of research trials conducted

  Not reporting on this Output for this Annual Report

Output #4

Output Measure

- Number of disease management recommendations based on disease samples processed

Year	Actual
2016	7922

Output #5

Output Measure

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

Year	Actual
2016	479466

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Pre and post tests, email follow-up evaluation
2	Total number of Master Gardener volunteer hours.

Outcome #1

1. Outcome Measures

Pre and post tests, email follow-up evaluation

Not Reporting on this Outcome Measure

Outcome #2

1. Outcome Measures

Total number of Master Gardener volunteer hours.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2016	191654

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 communities.

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

Results
A total of 380 new and 2,445 returning Master Gardeners contributed a total of 191,654 volunteer hours.

4. Associated Knowledge Areas

KA Code	Knowledge Area
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
216	Integrated Pest Management Systems

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

Drought regulations impacted some programs.

In some parts of Georgia, excessive rain prevented some fieldwork and several field tours and demonstrations.

Severe changes in weather patterns can change disease dynamics, therefore preventing or diverging emphasis on certain disease.

Government regulations on certain fungicides can hamper the applicability of those in disease control.

Public perception regarding the use of environmentally friendly chemicals controls strategies, as well as the potential turfgrass industry change in research and direction.

In 2016, temperature had a dramatic impact on turfgrass green-up and the increasing disease activity in warm-season grasses. It was also the warmest year on record, inciting disease outbreaks in warm- and cool-season grasses. Changes and additions of fungicides provided added both challenges and new ways to combat disease.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

The program objectives for the year were accomplished and surpassed predictions. We have been successful in attaining a variety of extramural funds for travel and other research and Extension activities.

People of all ages, especially college students and youth, are interested in learning to grow their own food. Response to education programs, both formal and informal, has been overwhelming.

It may be too early to tell just how many of the visitors and volunteers who participate in programs at UGArden will actually wind up growing their own food, but feedback has been very positive at all levels.

A total of 1,870 youth, college students, and adults visited UGArden for either a tour or volunteer activity. In addition, over 7,000 hours of volunteer time went into working on the farm as part of a community food distribution program.

Researchers increased the number of scientific publication citations. Web traffic to our publications exemplifies the impact of this research and Extension activities. Additionally, participants increase their turfgrass disease knowledge, and participants' implementation of gained knowledge are measures of success of this program.

Interspecific crosses have been successful with some species, including vitex (chaste tree), abelia, spigelia (Maryland pinks) and Exochorda (pearl bush). Hybrids are being evaluated. Efforts to obtain sterility of potentially invasive species is ongoing. Native plant species are being evaluated in containers and in the field for landscape qualities.

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.

Program objectives were accomplished despite numerous hardships due to external factors. Hybrid plant research showed positive results.

Master Gardener volunteers demonstrated a wealth of knowledge that 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%
	Total	100%	100%	0%	0%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2016	Extension		Research	
	1862	1890	1862	1890
Plan	6.4	3.0	0.0	0.0
Actual Paid	7.8	2.0	0.0	0.0
Actual Volunteer	112.5	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**
826496	726379	0	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
826496	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

Specialists disseminated parenting fact sheets and bulletins on a variety of topics, including relationship education, parenting, and brain development. They also provided parenting and child care education classes to improve the knowledge and skills of adults caring for children.

Georgia 4-H provided opportunities for youth to make meaningful decisions regarding 4-H programs at the county, district, and state levels.

Extension disseminated the eXtension "Just in Time" parenting newsletters, shared brain development information and training through the Extension-led Better Brains for Babies initiative, and provided information about preschoolers' growth and development through the "Growing Together" monthly newsletter. County Extension offices also distributed other parenting education resources (including the "Building Baby's Brain" publication series, the "Grandparents Raising Grandchildren" publication series, and the "Principles of Parenting" publication series), and provided educational workshops for parents with specific needs and issues.

Programs focusing on studying science in the context of real-world environments remain. Wahsega 4-H Center in Dahlonega, Georgia, Fortson 4-H Center in Hampton, Georgia, Rock Eagle 4-H Center in Eatonton, Georgia, Burton 4-H Center on Tybee Island, Georgia, and 4-H Tidelands Nature Center on Jekyll Island, Georgia, remained important sites for hands-on, experiential education. The Jekyll Island 4-H Center, now called "Camp Jekyll," closed in December 2014 to be rebuilt, and reopened in 2017.

Field studies were offered at five locations covering living history, ropes, team building, ecology, outdoor skills, and animal studies. The 4-H Ambassador program offered a science track. Science workshops were also infused into Junior Conference. Science programs were delivered through in-school club meetings, and National Youth Science Day was promoted and implemented through county offices across Georgia.

The 4-H Youth Development program facilitated 4-H Healthy Living, STEM, and Agriculture, College and Career Workforce Preparation, Mentoring, and Entrepreneurship workshops, presentations, or club meetings to targeted youth audiences or adults who work with youth activities.

University of Georgia Department of Animal and Dairy Science 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.

We built community capacity to support healthy and stable couple relationships by: (a) identifying current local partners and forming new collaborations that will support couple and relationship education; (b) working with community partners to build public awareness, recruit participants, secure programming space, and (co-)teach programs; and (c) training professionals who work with youth and adults to support healthy couple relationships.

2. Brief description of the target audience

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 youth.

All Georgia youth 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, 142 Georgia experts answered 792 questions in eXtension.

V(E). Planned Program (Outputs)

1. Standard output measures

2016	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	1428122	805512	8488254	4787676

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

Patent Applications Submitted

Year:	2016
Actual:	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2016	Extension	Research	Total
Actual	5	0	5

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
2016	29

Output #2

Output Measure

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

Year	Actual
2016	25

Output #3

Output Measure

- Number of Leadership, Entrepreneurship, and Science Meeting sessions coordinated

Year	Actual
2016	4882

Output #4

Output Measure

- Number of 4-H volunteer hours.

Year	Actual
2016	233896

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

Year	Actual
2016	8140

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, 8,140 enhanced decision making skills and developed positive leadership skills, increased their knowledge of entrepreneurship, and increased their knowledge of science.

4. Associated Knowledge Areas

KA Code	Knowledge Area
608	Community Resource Planning and Development
806	Youth Development

Outcome #2

1. Outcome Measures

4-H total enrollment

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2016	170353

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 170,353 young Georgians gained experience and knowledge through 4-H programs.

4. Associated Knowledge Areas

KA Code	Knowledge Area
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
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

Brief Explanation

Family resources, school relationships, and child care regulations impact this planned program.

The rate of child abuse and neglect in Georgia has gone down considerably in recent years, from a high of 21.2 per 1,000 children in 2003 to a rate of 10.2 children per 1,000 in 2014. Although the drop in Georgia's rate of abuse and neglect is a positive indicator of a lower overall risk of abuse and neglect for Georgia children, abuse and neglect still disrupt the learning and development of too many Georgia children.

As state priorities and expectations for educating parents and early childhood teachers change, Extension's role in providing this training also changes. At the moment, state agencies such as the Department of Early Care and Learning are staffing their educational efforts primarily with their own employees, which reduces the grant funding available for Extension educators. At the same time, the Division of Family and Children Services Office of Prevention and Family Support has expanded its support for the Better Brains for Babies project, enabling Extension to teach brain development content to a broader audience.

When weather is questionable, schools have to make decisions not to transport their students, which can result in cancellation of field study programs.

While Georgia 4-H continues to work to provide meaningful opportunities for youth, our priority areas do shift from year to year based on the specific needs identified by the local Extension leadership team (county advisory council). In addition, some collaborating organizations have changed their focus, resulting in minor modifications in the programs and/or events delivered by Georgia 4-H.

The 4-H Youth Development weekly, biweekly, monthly, or bimonthly programs are at no cost to all participants as long as the Extension funds continue to provide funding for these programs, the economy stays consistent, and there are not major natural disasters that make programming impossible.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Agent knowledge of brain development was analyzed using pre- and post-workshop tests at the Better Brains for Babies two-day community outreach educator training workshop. Agents (and other non-Extension participants) showed significantly better knowledge of key brain development concepts at the end of the workshop than at the beginning.

A retrospective post then pre was used instead of a post/pre knowledge assessment. Evaluation data collected throughout the year demonstrates a statistically significant increase in participants' positive relationships with their classmates, positive relationships with their teacher, knowledge about the ecosystems of Georgia, knowledge that their behaviors affect the environment, and connection to nature.

A majority of the youth self-reported that they increased their knowledge of the subject matter, that they would change their behaviors, and that they were better prepared to take on leadership responsibilities.

For each 4-H program area, all participants were given pre-programming and post-programming National 4-H Common Measures surveys in order to evaluate how much new knowledge and life skills they acquired. At the beginning and at the end of each calendar or programmatic duration of time, National 4-H Common Measures surveys will be disseminated to 4-H youth participants.

A committee of agents and teachers meet at the end of the project year to review the program and make changes to the program for the next season.

The evaluations indicated that all participants learned ways to improve their knowledge of the equine industry, as well as improved handling and management of their horses.

Key Items of Evaluation

Participants showed significantly better knowledge after attending workshops and presentations.

Youth demonstrated an increase in knowledge, confidence, and intention to use the skills they gained.

VI. National Outcomes and Indicators

1. NIFA Selected Outcomes and Indicators

Childhood Obesity (Outcome 1, Indicator 1.c)	
0	Number of children and youth who reported eating more of healthy foods.
Climate Change (Outcome 1, Indicator 4)	
0	Number of new crop varieties, animal breeds, and genotypes whit climate adaptive traits.
Global Food Security and Hunger (Outcome 1, Indicator 4.a)	
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.
Global Food Security and Hunger (Outcome 2, Indicator 1)	
0	Number of new or improved innovations developed for food enterprises.
Food Safety (Outcome 1, Indicator 1)	
0	Number of viable technologies developed or modified for the detection and
Sustainable Energy (Outcome 3, Indicator 2)	
0	Number of farmers who adopted a dedicated bioenergy crop
Sustainable Energy (Outcome 3, Indicator 4)	
0	Tons of feedstocks delivered.