

2012 Clemson University and South Carolina State University Combined Research and Extension Plan of Work

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I. Plan Overview

1. Brief Summary about Plan Of Work

South Carolina's plan update reflects a continuing focus on the primary land grant mission to support economic and community development in the traditional agricultural, animal and plant emphasis areas. Biotechnology has been eliminated as a Clemson research program area. The ongoing research and the related FTE's are being reflected in the programs where the work will have an impact. The sustainable agronomic crop systems program and horticulture food-related crop program have been integrated into the global food security and hunger program. Clemson Extension will report all youth programs under 4-H and Youth Development. This is part of an effort to bring South Carolina's research and extension efforts in line with the NIFA priority areas.

Overall, Clemson's research FTE's decreased from 44.8 in Fiscal year 2010 to a projected 40.2 for 2012 and subsequent years. This generally reflects the increasing costs associated with providing adequate support for each research project. The 1890 Research and Extension Program continues to operate with a total of 55 FTEs (Extension - 42 and Research 13). If the economy continues to spiral downward, the Research and Extension Program will be forced to cutback in services as well as personnel.

Scientists are studying which forage crops are best suited to produce forage-fed beef and how the forages interact with meat quality. With proper management and improved forages, beef cattle can find something to eat in Southeastern pastures twelve months out of the year - that's a real advantage for Southeastern beef producers.

Research is underway to develop an integrated pest management strategy for scale. According to members of the ornamental industry, scale is one of the highest research priorities for nursery crops. The effort will attempt to find an effective and environmentally friendly control for scale insects in ornamentals and to develop a pest management strategy based on the life history of soft scales (Coccidae family), characterized by a waxy covering on the insect's body.

Researchers are developing and testing technologies for site-specific detection and control of plant-parasitic nematodes either to lower the use of high-risk pesticides, such as carbamates and soil fumigants, or to optimize nematicide utilization in cotton production in the southern U.S. Researchers are focusing on stream and watershed ecology in South Carolina, measuring water quality given the range of land-use practices that affect it -- forestry, farming, ranching, confined animal culture, and urban development. One research site is the Chattooga River, forming the SC/GA border.

Research is in progress to discover how spiders can produce one of the strongest fibers known to man - spider silk. Finer than human hair, lighter than cotton, and ounce-for-ounce five times stronger than steel, the potential uses and benefits of the new material would be nearly limitless: wear-resistant clothes and footwear, stronger seatbelts, corrosion-free car panels and bumpers, improved sutures and bandages, artificial tendons and ligaments and safer bulletproof vests for soldiers and police.

Scientists are heat-treating animal manure to reduce illness-causing bacteria from getting into farms and

gardens through manure used as fertilizer. Composting often is used to reduce the spread of pathogens before mixing into the soil, but it must be done correctly. Bacteria are survivors, some lasting more than year under the right conditions.

Research will attempt to identify how environmental factors, including community factors but focusing specifically on family domain factors, affect the weight regulating behaviors of children from underserved families. Information will be used to increase the development and efficacy of programs and interventions to prevent and control obesity.

Researchers are examining dormancy and chilling of fruit trees in South Carolina. Focusing on peach trees, research could help breeders and growers develop trees better attuned to the local winter environment. The genetic and cellular signals that begin dormancy and the developmental events involved in bud formation and non-growth seasonal phases are being examined.

Processed switchgrass - a biofuel easily grown in South Carolina - is being tested to make bioethanol. The research team focuses on freeing the plant sugars from cellulose, which plants use for cell walls. Champagne yeast, which is more active than other yeasts, and an enzyme is mixed with the glucose and xylose - the two most prevalent plant sugars - to brew bioethanol. Switchgrass is classified as a second-generation biofuel - a non-food crop used to make ethanol.

Scientists will be investigating biochemical pathways found in certain disease-causing eukaryotic microbes, including the fungus *Cryptococcus neoformans* and the single-celled protozoan *Entamoeba histolytica*. One is connected with fungal meningitis, the other with amoebic dysentery. This work will deal with how some simple forms of life make and regulate energy. Regardless of size, all living cells must have fuel in order to thrive and reproduce. The research will not only advance scientific understanding of how energy in some microorganisms is regulated but also how to disrupt the process. The work can lead to new medicines to treat the 50 million *E. histolytica* infections worldwide, which leads to approximately 70,000 deaths from amoebic dysentery annually.

Clemson Extension does not anticipate an increase of FTEs in the FY 2012-16 plan. The focus for Clemson Extension for the next five years for forestry and natural resource areas will be to develop outreach efforts and educational resources that target new audiences, with emphasis on commercial audiences, launch a new mass media campaign targeting homeowner practices to teach how individual behaviors affect recreation and people's ability to make their livelihood, develop new curriculum targeting youth and develop a recognition program targeting homeowners and businesses. 4-H youth development will focus on volunteer training and science programs. In community and economic development, we will continue efforts to support the state and local agribusiness communities and continue to build the leadership capacity of the citizens of the state. Partnerships developed through the Center for Healthy Living will strengthen our capacity to be a national leader in addressing the obesity epidemic. In the area of global food security and hunger, we will continue to support growers and producers in the implementation of systems that are economically sustainable, safe and environmentally sound. We will be aggressive in monitoring and training about potential threats to plant and animal agriculture. We are collaborating to develop a Dairy Workers Program for SC dairymen to help educate their employees. Multiple animal programs targeting youth will continue. We will continue to certify producers to improve their marketing potential.

Underrepresented and underserved populations in the state will continue to be a source of stakeholder input. There will continue to be a focus on providing educational programs to improve the well-being of the family structure within limited resource communities; and to promote change in the lives of youth and to strengthen family values through youth development programming. Leadership programming will be provided to assist limited resource communities with leadership development education programs and tie leadership development to community economic development initiatives within communities. Programs will

be designed to alert, inform, and educate high school students in the fundamental concepts of financial planning.

The 1890 Research and Extension Program has several priority goals to accomplish during the next five year cycle of the Plan of Work. The priority goals include beginning reconstruction of the Camp Harry Daniels Facility, securing land and constructing cluster centers in target counties across the State, expanding the Mobile Technology Center Outreach, increasing the involvement of faculty and the number of inter-disciplinary research projects, expanding internal and external collaborations and partnerships to build the land-grant capacity and launching campus/community health initiatives to address health disparities. 1890 plans to increase their external funding to support programmatic and operational initiatives.

1890 Extension will take its programs and services to the people as the Mobile Technology Unit travels to remote areas of the state providing wireless computer Internet access to individuals at various facilities within a 100 yard radius. The Community Development Cooperation (CDC) will continue to assist residents with home repairs (minor and major) to revitalize communities, credit counseling and homeownership. The Rural Business Program will expand and enhance its technical assistance to stakeholders and businesses throughout the state. 4-H and Youth Development and Food Safety and Nutrition will continue to be a priority focus as well as Global Food Security and Hunger and Childhood Obesity.

South Carolina State University and Clemson University will continue to coordinate their Research and Extension programming efforts. The universities will also continue to cooperate on research project reviews.

Multi-state research activities will continue to be emphasized as researchers actively participate in establishing multi-state projects with their colleagues in other states in the region and across the country. Research and Extension faculty will continue to be encouraged and supported in their efforts to obtain outside funding to leverage their federal and state funding base.

Estimated Number of Professional FTEs/SYs total in the State.

Year	Extension		Research	
	1862	1890	1862	1890
2012	160.0	42.0	40.2	13.0
2013	160.0	42.0	40.2	13.0
2014	160.0	40.0	40.2	10.0
2015	160.0	40.0	40.2	10.0
2016	160.0	40.0	40.2	10.0

II. Merit Review Process

1. The Merit Review Process that will be Employed during the 5-Year POW Cycle

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

2. Brief Explanation

The Research and Program Development Committee of the South Carolina State Extension Advisory Council is responsible for reviewing and commenting on new programs initiated by Clemson University and South Carolina State University. The seven-member Research and Program Development Committee is one of the Council's three committees that reviewed the list of programs and descriptions that were conducted. The committee serves as the external non-university panel for program review. The committee members are knowledgeable of South Carolina's social and economic demographics and are sensitive to the needs of underserved and underrepresented populations. The total Council had the opportunity to give input about programs. There are Extension volunteers, producers, a community center program coordinator, a public school educator, and business owners.

There are internal university review panels. All proposed research projects are reviewed and critiqued by a research panel. Clemson Extension programs are reviewed by state Extension Program Team Leaders and administration. Both panels review projects and programs based on organizational capacity, relevance, and impact. In addition, all research projects go through a review process as outlined under Hatch regulations. This serves as the Expert Peer Review process.

The Internal University Panel periodically reviews South Carolina's plan of work. The Research and Program Development Committee is kept abreast of new national priority areas and of the realignments of Research and Extension activities to focus on the NIFA priority areas. The program review activities of the committee will complement the scientific peer review process established at both institutions.

III. Evaluation of Multis & Joint Activities

1. How will the planned programs address the critical issues of strategic importance, including those identified by the stakeholders?

Multi-state research programs are the result of extended collaboration and consultation between faculty members in the respective states. The decision to move forward with a regional program is based on the appropriateness of the program to address critical issues, the ability of faculty to develop, implement and evaluate the program and on the potential for the program to be effective meeting the identified needs of the citizens and industries in the state.

Planned Extension programs will be those that address critical needs as identified by local stakeholders. In addition, relevant nationally identified issues will be addressed. Examples of criteria used are:

- Does the program address major societal problems, needs, or opportunities that are well-defined and documented?
- Does the program have an identified evidenced base?

- Can Extension impact be measured and reported?
- Does the program fit within the strategic goals of PSA?
- Can effective marketing and public awareness methods be implemented?
- Does the program attract financial and other resources and is supported by systematic fund development?
- Can skills and expertise of paid and volunteer staff be used?
- What partnerships can be established?
- Does the program have an appropriate delivery system in place for effective implementation?
- Does the program identify internal and external resources and expertise?

Delivery methods can be implemented through face to face interactions, distance education, electronic methods, printed materials, media, etc.

2. How will the planned programs address the needs of under-served and under-represented populations of the State(s)?

Research and Extension program activities address issues which impact all segments of the population, to include global food security and hunger, sustainable energy, youth and family issues, nutrition, food safety, water and natural resources, and issues relating to plants and animals. Underserved and underrepresented populations will be used to identify areas of need. Stakeholder input is particularly critical in identifying programs that have a broad reach in terms of numbers and economic groups, especially limited-resource persons, which can be served. Results in the form of knowledge and its application will be transferred through the resources of Extension in the various states. Activities in community and economic development, nutrition and 4-H are particularly beneficial to underserved and underrepresented populations

3. How will the planned programs describe the expected outcomes and impacts?

The planned and potential impact of each program is outlined in the program's initial design. Outcomes and impacts are key discussion areas as decisions are made to initiate, continue or terminate programs. Typically, outcomes and impacts are presented in terms of new knowledge and new applications of current knowledge. The descriptions of the outcomes may include descriptions of the products, processes and procedures that are anticipated and may reflect the number of individuals, communities and industries who are anticipated to benefit.

Goals, objectives, target audiences, and measureable outcomes and impacts will be identified. Impact will be assessed through established indicators for all projects. The Clemson University Management Information System (CUMIS) is a web based reporting system that provides data relative toward programs, numbers of programs conducted, number of persons completing programs, knowledge gain, economic gains through generations of additional income on savings, adoption of practices as a result of participation, and contacts made for the Cooperative Extension Service. Individuals with Extension appointments report his/her activities each month in the system. In addition, narrative summaries will be used.

The 1890 Research and Extension Program designed, developed and implemented an internal system reflective of the USDA Plan of Work System to collect, monitor and evaluate data of researchers and agents. The staff utilizes the system to input data on knowledge gained, workshops conducted and attendees completing workshops, number of persons participating and completing programs, knowledge gained, direct/indirect contacts of adults and youth,

publications, patent applications, business plans, number who adopted practices, as well as other pertinent information to address the state defined outputs. The data assists in preparing the qualitative outcomes and impacts of the designated priority goals.

4. How will the planned programs result in improved program effectiveness and/or

The programs in the Plan of Work are designed for periodic evaluation to ensure that they are on target to meet the specified goals. Technically, for the periodic evaluation, the use of an informal review session to complement the annual written progress reports helps to refine the approach and the deliverables while the program is still in progress as programs meet objectives and conclude. The comparison of the initial goals and the actual outcomes is used in the design of new programs.

IV. Stakeholder Input

1. Actions taken to seek stakeholder input that encourages their participation

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

Brief explanation.

Stakeholder input remains a key to successful Extension programs. Clemson and South Carolina State have a long history and tradition of seeking stakeholder input into the Plan of Work process. The process of seeking stakeholder input included identifying stakeholders that should have input in the POW process and determining the process used in seeking stakeholder input.

Meetings with commodity groups are particularly helpful in determining research priorities and needs for on-farm Extension support. Input from participants and graduates from programs available statewide, such as the Master Gardener Program is used to upgrade and enhance the quality of the program and identify new participants.

The most recent process used in seeking stakeholder input included meetings that were held in all counties in the state to identify issues and set priorities for agricultural Research and Extension. Stakeholders were identified and invited to attend a meeting. Stakeholders included those internal to the Cooperative Extension and 1890 System--administrators, extension agents, agent associations, specialists, faculty, department chairs, associate deans, and faculty, as well as, those external to the system. External stakeholders are Extension advisory boards members, commodity group representatives, community leaders, human service providers, business/industry representatives, and collaborators (Farm Bureau, Chamber of Commerce, Farm Service Agencies, etc).

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

1. Method to identify individuals and groups

- Use Advisory Committees
- Use Internal Focus Groups
- Use External Focus Groups
- Open Listening Sessions
- Needs Assessments
- Use Surveys

Brief explanation.

People who are already involved in Research and Extension programs or receive services as well as people who may not be involved, but may have similar interests or are addressing similar concerns are identified and contacted.

2(B). A brief statement of the process that will be 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.

The advisory meetings are attended by county advisory committee members and other key stakeholders. A Nominal Group Technique (NGT) was used to garner stakeholder input for the Plan of Work process. NGT is a process that allows a group of individuals to generate a large number of ideas in a relatively short period of time. NGT is helpful in identifying problems, exploring solutions and establishing priorities.

Several steps were involved in conducting the NGT. First, each of the 46 South Carolina counties was asked to conduct a NGT. Second, instructions were provided to all county offices/county directors of the steps involved in conducting the NGT. Third, to assure diversity, emphasis was placed on obtaining a cross section of people that represent the local community. Fourth, a set of rules and procedures was established for the smooth operation of NGT. Fifth, a series of questions were identified to which stakeholders were to respond.

Annual meetings around the state are open to the general public and held to gain input on stakeholder interests, concerns, and needs. A survey instrument is being designed to collect stakeholder input and issue identification for research and Extension. Participants are asked to evaluate the effectiveness of Extension programs, major concerns in the county and recommend topics they feel Extension can adequately address. They also give program ideas. Each county compiles data from the stakeholder meetings and makes adjustments in program design and implementation.

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.

State Program Leaders identify the major programs for the new federal Plan of Work using the identified list of issues. The programs are defined using the logic model. The state Plan of Work, which includes specific initiatives and projects, is developed based on the identified programs. The process is used to identify emerging issues and to redirect Extension programs. Programs are developed, expanded, or eliminated based on their quality and/or effectiveness. In addition, the priorities identified are considered when hiring staff and when establishing action plans. Through these and other efforts, the South Carolina Cooperative Extension and 1890 System are kept current on stakeholder programs and services that have the potential to affect public policy, social, economic value and efficiency, environmental quality and individual well-being.

V. Planned Program Table of Content

S. No.	PROGRAM NAME
1	Sustainable Animal Production Systems
2	Sustainable Agriculture Production for (non-food) Horticultural Crops
3	Water Quality and Water Quantity
4	Food Safety and Nutrition
5	Community, Leadership, and Economic Development
6	4-H Youth Development and Families
7	Environmental Conservation for Wildlife
8	Sustainable Forest Management
9	Childhood Obesity
10	Climate Change
11	Sustainable Energy
12	Global Food Security and Hunger

V(A). Planned Program (Summary)

Program # 1

1. Name of the Planned Program

Sustainable Animal Production Systems

2. Brief summary about Planned Program

The program will have two primary research components. The first is animal health and animal productivity in beef and dairy cattle through integrated resource management, grazing initiatives. Some of the grazing work focuses on the marketing of forage-fed beef, and other selected management techniques, to include proteomic and genetic approaches to investigate mammary development in dairy cattle. Related work will also continue on modifying milk fat composition for improved nutritional and market value. The second component has several initiatives dealing with poultry, including genetic bases for resistance and immunity to avian diseases and more specific work on the effects of fumonisin B-1 on chicken immunity. Work is also underway on the effects of environment on welfare, behavior and physiology of laying hens and spontaneous ovarian adenocarcinoma in aging and aged commercial laying hens.

In South Carolina, Clemson is the sole source for providing training as required by law for all livestock and poultry producers to receive their waste permits. The Confined Animal Manure Management Training Program (Camm) is an educational program that is required by state law for all livestock and poultry producers as a condition of their waste permit. All new producers must attend the program within one year of beginning operation. All swine producers, and all large dairy and poultry producers are required to be certified animal manure managers. Producers are required to pass a comprehensive exam on manure management to obtain certification. All animal waste permit holders are required to obtain 10 hours of recertification credit every five years. Clemson Extension provides seminars, field days, and conference presentations to provide the required continuing education.

Extension will provide programs to improve the production efficiency, grazing management and marketing of confined animal systems, provide programs on current and emerging specialty animal industries, protect water quality in and from pastures, increase awareness of herd health and reproduction, promote energy conservation, nutrient management, improve siting of facilities, and improve alternative waste handling practices.

In Extension, the Livestock Program (Beef Cattle Improvement and Meat Goat) provides small-scale, limited-resource farmers hands-on trainings and promotes an alternative livestock enterprise compatible with farm size and system.

3. Program existence : Mature (More than five years)

4. Program duration : Long-Term (More than five years)

5. Expending formula funds or state-matching funds : Yes

6. Expending other than formula funds or state-matching funds : Yes

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
301	Reproductive Performance of Animals	20%	20%	20%	20%
302	Nutrient Utilization in Animals	20%	20%	20%	20%
303	Genetic Improvement of Animals	15%	15%	15%	15%
307	Animal Management Systems	20%	20%	20%	20%
308	Improved Animal Products (Before Harvest)	15%	15%	15%	15%
315	Animal Welfare/Well-Being and Protection	10%	10%	10%	10%
	Total	100%	100%	100%	100%

V(C). Planned Program (Situation and Scope)**1. Situation and priorities**

Production and income from beef cattle has been increasing since 2002, and in 2003 the state produced 318 million pounds of milk and milk cash receipts from marketing increased from 2003 to 2004. South Carolina ranks 12th in the nation in broiler production, raising 204,500,000 in 2004, representing a 4% increase from the previous year, and so this area is meeting the needs of a large and expanding agricultural industry. Continuing momentum in the agribusiness components requires a solid research base and a knowledgeable agent base.

There is concern for the small-scale livestock producers in South Carolina not being able to receive premiums for their cattle. Many producers lack the proper facilities needed to administer the animal health products required for premium prices. Seminars, workshops as well as equipment needs will be addressed to assist the limited-resource farmer.

Poultry production continues as a major industry in South Carolina, and researchers work closely with industry to identify specific needs which can be addressed with university resources.

Public concern over the management of animal manure has become a major environmental issue in South Carolina centered on water quality (surface and groundwater) and gaseous emissions including odors. There is less tolerance for odors yet more potential for surrounding neighbors to be impacted by odors because of the location of operations in communities. Social problems have created an ever-increasing hostility between animal producers and surrounding neighbors. In addition, animals have not been efficient users of nutrients supplied in their diets. Therefore, significant plant nutrients are found in animal manures. The nutrients, particularly nitrogen, phosphorus, and potassium, are needed for crop inputs for crops like corn and soybean. Surveys indicate that nearly one half of all animal manure applied to land is not credited as a nutrient source. Animal manure nutrients can be applied at excessive rates if better management practices are not adopted. The excessive rates of application can lead to both surface and groundwater pollution.

2. Scope of the Program

- In-State Extension
- In-State Research
- Multistate Research

V(D). Planned Program (Assumptions and Goals)

1. Assumptions made for the Program

It is assumed that there is a market demand for forage-fed beef, improved nutritional value in milk, and producers need every advantage and the latest knowledge to remain competitive in their businesses. It is also assumed that disease resistance in poultry flocks is an area of critical importance and of great interest to the poultry industry in South Carolina and in neighboring states.

In general, issues related to animal health are a major area of concern in the state. Educational programs can teach producers best management practices that lead to production and economic efficiency. The Animal Production program promotes an alternative livestock enterprise, assists farmers in improving their niche market, and provides access to pure breed bulls.

2. Ultimate goal(s) of this Program

The goals of the program are first to increase profitability for growers. This includes supporting the development of niche markets for beef, dairy and poultry producers, which allows farmers in the state to diversify their operations and make local products available to the citizens of the state. Another goal is to develop and implement animal production systems that are economically sustainable and environmentally sound. Also, provide training that will increase herd management skills and assist producers in making informed business decisions is another important goal.

V(E). Planned Program (Inputs)

1. Estimated Number of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890
2012	10.0	7.0	4.4	0.0
2013	10.0	7.0	4.4	0.0
2014	11.0	7.0	4.4	0.0
2015	11.0	7.0	4.4	0.0
2016	11.0	7.0	4.4	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

Activities will include research on animal health and animal productivity in beef and dairy cattle through integrated resource management, grazing initiatives and research to assist the poultry industry, to include

specific work on the effects of fumonisin B-1 on chicken immunity.

Educational programs will be conducted that focus on animal production systems.

2. Type(s) of methods to be used to reach direct and indirect contacts

Extension

Direct Methods	Indirect Methods
<ul style="list-style-type: none"> ● Education Class ● Workshop ● Group Discussion ● One-on-One Intervention ● Demonstrations 	<ul style="list-style-type: none"> ● Public Service Announcement ● Newsletters ● TV Media Programs ● Web sites other than eXtension

3. Description of targeted audience

Producers, Limited-Resource Farmers and Extension personnel, agency personnel, etc.

V(G). Planned Program (Outputs)

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
 - Direct Adult Contacts
 - Indirect Adult Contacts
 - Direct Youth Contacts
 - Indirect Youth Contact
- Number of patents submitted
- Number of peer reviewed publications

Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(H). State Defined Outputs

1. Output Measure

- Disclosures
- Licenses
- Number of people completing educational workshops
- Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(I). State Defined Outcome

O. No	Outcome Name
1	Number of publications authored or co-authored (fact sheets, papers presented at Extension meetings, etc.)
2	Number of people reporting increased knowledge

Outcome # 1

1. Outcome Target

Number of publications authored or co-authored (fact sheets, papers presented at Extension meetings, etc.)

2. Outcome Type : Change in Condition Outcome Measure

2012:8	2013:12	2014:8	2015:8	2016:6
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3. Associated Knowledge Area(s)

- 301 - Reproductive Performance of Animals
- 307 - Animal Management Systems

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension

Outcome # 2

1. Outcome Target

Number of people reporting increased knowledge

2. Outcome Type : Change in Knowledge Outcome Measure

2012:6500	2013:8000	2014:14500	2015:14500	2016:14500
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3. Associated Knowledge Area(s)

- 307 - Animal Management Systems
- 315 - Animal Welfare/Well-Being and Protection

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

V(J). Planned Program (External Factors)

1. External Factors which may affect 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.)

Description

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

V(A). Planned Program (Summary)

Program # 2

1. Name of the Planned Program

Sustainable Agriculture Production for (non-food) Horticultural Crops

2. Brief summary about Planned Program

The research element of the program for improving productivity and profitability of the SC peach industry includes developing and improving pome and stonefruit rootstocks through breeding and genetic engineering, focused on resistant gene candidates. The eradication, containment and/or management of Plum Pox disease and other viruses in peaches is another major component of the program, as is acquiring new rootstocks from worldwide sources. Providing expertise in the diagnosis of viral diseases and formulating methods for the control of viral diseases, nepoviruses and other viruses associated with virus-like symptoms seen in SC melons, and watermelon mosaics virus and other viruses found in cucurbits. A third research element of the program will facilitate the development of virus control programs by identifying the pathogens associated with the disease, determining epidemiological properties, developing strategies and assist in their implementation. The research program will have several other activities underway paralleling the three elements focusing on improving productivity and profitability. These include rapid screening of pesticide residues in fruits, biological control of soil-borne plant pathogens and characterizing causal agents associated with graft-transmissible diseases of unknown etiology to facilitate the development of rapid diagnostics and appropriate control measures.

Research is underway to develop an integrated pest management strategy for scale. According to members of the ornamental industry, scale is one of the highest research priorities for nursery crops. The effort will attempt to find an effective and environmentally friendly control for scale insects in ornamentals and to develop a pest management strategy based on the life history of soft scales (Coccidae family), characterized by a waxy covering on the insect's body.

The research team will also observe the effectiveness of combining degree-day information with reduced-risk insecticides. While ill-timed insecticides are often ineffective, scale insects are prone to a variety of natural enemies, most of which are harmed by more toxic insecticide sprays. Chong hopes that less toxic, more targeted insecticides--when used at the proper time in the insects' development--will conserve natural enemies.

For 1890 Research, there are several projects that are focusing on the sustainable agriculture production. The projects focus on (1) preparing new monomers and new polymers, (2) identifying genetic analysis of responses to male pheromones in *Drosophila melanogaster*, (3) innovative reduced-risk management strategies for Anobiidae pest in stored product environments and (4) economic impacts of international trade and domestic policies on southern agriculture.

For Extension, the program will focus on developing and implementing practices that are economically sustainable and environmentally sound. Objectives include improving profitability and reducing negative environmental impacts of horticultural (non-food) systems, increasing efficiency of production, and increasing the supply and dissemination of information and knowledge about IPM strategies that are available to growers.

Educational and technical assistance to small-scale, part-time limited resource farmers will be provided. Farmers are encouraged to utilize the latest practices. The 1890 program will establish on-going technical assistance programming for small minority farmers and increase their profitability in farming. 1890 will also continue vegetable production and marketing training for commercial vegetable producers and home gardeners to increase home food supply and fresh produce for local marketing

outlets.

3. Program existence : Mature (More than five years)

4. Program duration : Long-Term (More than five years)

5. Expending formula funds or state-matching funds : Yes

6. Expending other than formula funds or state-matching funds : Yes

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
201	Plant Genome, Genetics, and Genetic Mechanisms	10%	10%	10%	10%
202	Plant Genetic Resources	10%	10%	10%	10%
204	Plant Product Quality and Utility (Preharvest)	10%	10%	10%	10%
205	Plant Management Systems	15%	15%	15%	15%
211	Insects, Mites, and Other Arthropods Affecting Plants	10%	10%	10%	10%
212	Pathogens and Nematodes Affecting Plants	10%	10%	10%	10%
215	Biological Control of Pests Affecting Plants	10%	10%	10%	10%
216	Integrated Pest Management Systems	15%	15%	15%	15%
601	Economics of Agricultural Production and Farm Management	10%	10%	10%	10%
	Total	100%	100%	100%	100%

V(C). Planned Program (Situation and Scope)

1. Situation and priorities

Researchers are actively investigating and refining critical components in constructed wetlands to meet remediation and recycling needs within the nursery and green industries.

Constructed wetlands are a "green" and cost effective treatment technology that nurseries can use to cleanse runoff water. Responsible use of resources is of critical concern for nurseries and the ornamental plant industry. It is likely that nutrient and pesticide presence in agricultural runoff will be regulated at local, state and federal levels in the coming years. At the same time, increased competition for water resources will require more conservative water use practices by the nursery industry. These practices will include more efficient irrigation methods and recycling of irrigation water.

There is an information need among South Carolina residents related to the improvement of environmentally sound horticultural practices. Through consumer education in environmental horticulture and by developing a pool of well-trained volunteers, this program can significantly enhance Extension's

ability for education and outreach and increase service hours toward direct enhancement of the horticultural practices of individuals. Consumers will be trained on environmentally sound horticultural practices (i.e. plant identification, selection, culture, pest identification, and integrated pest management) to improve their neighborhoods in a socially acceptable manner that does not contaminate the environment with excess fertilizer, inappropriate pesticides, or harmful exotic plants.

2. Scope of the Program

- In-State Extension
- In-State Research
- Multistate Research
- Integrated Research and Extension

V(D). Planned Program (Assumptions and Goals)

1. Assumptions made for the Program

Educational programs will provide consumers with information so that they can make informed decisions to improve profitability and reduce the negative environmental impacts of horticultural systems. The educational activities will minimize off-farm inputs for low income producers and maximize on-farm resources.

Techniques for eradicating, containing or managing viral diseases and nepoviruses will increase the profitability of the fruit industry in SC as well as slow the economic decline of small farms. Research and program delivery can increase awareness of risks with agriculture production. Training workshops can provide adequate recording keeping techniques.

2. Ultimate goal(s) of this Program

The goal is to reduce costs and negative environmental impacts and to increase profitability for SC fruit growers. In addition, the program will encourage growers to adopt new horticultural production practices. The program will help to simplify farm record keeping, which encourages participants to maintain farm records on a continuous basis and improve financial management; educate farmers on ways to implement production systems that require the application of low off-farm input and provide opportunities for farmers to grow crops that satisfy consumer demand within environmentally safe conditions.

V(E). Planned Program (Inputs)

1. Estimated Number of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890
2012	22.0	7.0	9.3	3.0
2013	23.0	7.0	9.3	3.0

Year	Extension		Research	
	1862	1890	1862	1890
2014	23.0	7.0	9.3	5.0
2015	23.0	7.0	9.3	5.0
2016	23.0	0.0	9.3	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

Educational programs will be conducted. Field trials will be conducted and demonstrated. Evaluation programs will provide growers with comprehensive and updated information on performance so that they can make informed decisions, especially about the selection of profitable peach varieties for new plantings. This program will promote and encourage activities that foster sustainable agriculture practices and policies. Research will focus on ways to eradicate, contain and manage viral diseases impacting fruit in SC as well as increase the capacity to manipulate and control pest species such as the fruitfly.

Economic impact of international institutions (WTO, IMF, World Bank) and trade agreements on the competitiveness of southern agriculture will be reviewed. Presentations will be documented outlining information identified by the researchers. The researchers will investigate the dispersal of *L. serricornis* among habitats by defining food resource use pattern and dietary history.

2. Type(s) of methods to be used to reach direct and indirect contacts

Extension

Direct Methods	Indirect Methods
<ul style="list-style-type: none"> ● Education Class ● Workshop ● Group Discussion ● One-on-One Intervention ● Demonstrations 	<ul style="list-style-type: none"> ● Public Service Announcement ● Newsletters ● TV Media Programs ● Web sites other than eXtension

3. Description of targeted audience

The audience will include producers, small farmers and Extension personnel, horticulture professionals, residents in counties with Master Gardener programs, Master Gardeners, and consumers.

V(G). Planned Program (Outputs)

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
 - Direct Adult Contacts
 - Indirect Adult Contacts
 - Direct Youth Contacts
 - Indirect Youth Contact
 - Number of patents submitted
 - Number of peer reviewed publications
- Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(H). State Defined Outputs

1. Output Measure

- Disclosures
 - Licenses
 - Number of people completing horticultural educational workshops
- Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(I). State Defined Outcome

O. No	Outcome Name
1	Number of Master Gardeners reporting activities and programs
2	Number of participants gaining knowledge

Outcome # 1

1. Outcome Target

Number of Master Gardeners reporting activities and programs

2. Outcome Type : Change in Action Outcome Measure

2012:1400 2013:1400 2014:1500 2015:1500 2016:1500

3. Associated Knowledge Area(s)

- 205 - Plant Management Systems
- 216 - Integrated Pest Management Systems

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 2

1. Outcome Target

Number of participants gaining knowledge

2. Outcome Type : Change in Condition Outcome Measure

2012:10500 2013:11000 2014:11000 2015:12000 2016:12000

3. Associated Knowledge Area(s)

- 205 - Plant Management Systems
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 216 - Integrated Pest Management Systems

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension
- 1890 Research

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

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

- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

Description

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

V(A). Planned Program (Summary)

Program # 3

1. Name of the Planned Program

Water Quality and Water Quantity

2. Brief summary about Planned Program

South Carolina's diverse natural resources including the coastline, rivers, woods and weather have attracted millions of people to visit or live here and to recreate in our natural areas. South Carolina landowners and public officials are not fully informed about how unique and valuable local natural resources are, yet ecotourism or nature based tourism has become the fastest growing section of the tourism industry. However, a significant barrier to development of the resources for recreation and tourism is poor water quality. Officials often are not aware of how to develop these opportunities, while at the same time minimizing the negative environmental impacts of such experiences, especially on water quality. This program seeks to: educate agricultural producers to increase acceptance of BMPs that protect and improve water quality, educate homeowners to increase acceptance of BMPs that prevent water pollution from the homestead, as through the Home-A-Syst and Coast-A-Syst programs, educate the public on how their different land-use practices impact the quality and quantity of water in urban streams, develop and deliver educational programming on stream restoration and water quality protection, develop participation in water quality volunteer groups, and train county volunteers to deliver Water Quality programming, present water quality and NPS pollution education for municipal and local government officials, design, demonstrate and promote the installation of riparian buffers and other environmentally appropriate plantings to protect water quality, promote environmentally sound natural resource recreation and tourism opportunities in South Carolina, and provide additional training to nature-based tourism professionals to ensure that the content and delivery of their educational programs is accurate and of high quality.

Equine Extension Specialists estimate that about 750,000 horses are used for trail riding in the Southern Piedmont states. Land managers throughout the nation agree that next to motorized trail traffic, horse traffic is the most difficult to manage for prevention of damage to forest ecosystems. The most fundamental management problems are those of controlling erosion and prevention of stream sedimentation and fecal contamination of surface waters.

Wetland and watershed management to improve water quality, wetland and aquatic wildlife habitat is a focus of this program. Increased knowledge about our wetland ecosystems, mankind's impact on water quality and what we can do to ensure proper water quality are important topics included in this program. Additionally, such a program increases the public's understanding and awareness of natural resource management, and builds a network of natural resource ambassadors.

The research program is focused on developing strategies for economically viable land use to coexist with good water quality. Research will characterize processes that control contaminant movement, contaminant bio-availability and toxicity, and contaminant degradation and assimilation by natural biogeochemical processes. Research on toxicity of metals and pesticides information will assist environmental regulators to develop site- specific water quality criterion for metals in surface waters.

Researchers will develop, improve and evaluate watershed models and other approaches for TMDL development and implementation, assess potential economic benefits and costs and equity associated with TMDL implementation at the watershed and individual landowner scale, and assess the potential ecological benefits of TMDL implementation at the watershed level.

The patent-pending, Intelligent River™ remote sensing technology that is a national model to provide real-time monitoring of water quality for rapid response to pollution events or discharge decisions will be installed. In addition, locations and information will be made available to researchers and community officials.

An 1890 researcher will focus attention on groundwater radioactivity. The study will look at radionuclides in groundwater throughout the Edisto River Basin in South Carolina. Groundwater is an important natural resource that is directly related to the health of rural residents, the development of local agriculture and natural environment. The radioactivity levels of the radionuclides in groundwater will be investigated.

3. Program existence : Mature (More than five years)

4. Program duration : Medium Term (One to five years)

5. Expending formula funds or state-matching funds : Yes

6. Expending other than formula funds or state-matching funds : Yes

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
111	Conservation and Efficient Use of Water	30%	30%	30%	30%
112	Watershed Protection and Management	20%	20%	20%	20%
131	Alternative Uses of Land	20%	20%	20%	20%
133	Pollution Prevention and Mitigation	20%	20%	20%	20%
134	Outdoor Recreation	10%	10%	10%	10%
	Total	100%	100%	100%	100%

V(C). Planned Program (Situation and Scope)

1. Situation and priorities

Changes in land-use patterns are impacting the state's resources in unplanned ways, such as the changes in water quality and quantity. Future wise use of the state's natural resources will require public education of the impacts that current and future land uses have on natural resources.

Researchers are focusing on stream and watershed ecology in South Carolina, measuring water quality given the range of land-use practices that affect it -- forestry, farming, ranching, confined animal culture, and urban development. One research site is located on the Chattooga River, forming the SC/GA border.

2. Scope of the Program

- In-State Extension
- In-State Research
- Multistate Research

V(D). Planned Program (Assumptions and Goals)

1. Assumptions made for the Program

A focus on improving and evaluating watershed models will assist policy makers in developing strategies for economically viable land use to coexist with good water quality.

The Intelligent River™ remote sensing technology that is a national model to provide real-time monitoring of water quality for rapid response to pollution events or discharge decisions will become increasing valuable as a research and management tool in the state

Education about the impacts of land use can result in informed consumers who use strategies to reduce the negative impacts on water and other natural resources.

2. Ultimate goal(s) of this Program

The goal of this program is to develop models which will provide a scientific basis for decisions on long term water quality issues in South Carolina and to teach Best Management Practices (BMP's) of natural resources at all levels of land ownership to minimize the negative environmental impacts on water.

V(E). Planned Program (Inputs)

1. Estimated Number of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890
2012	5.0	1.0	3.3	1.0
2013	5.0	1.0	3.3	1.0
2014	7.0	1.0	3.3	1.0
2015	10.0	1.0	3.3	1.0
2016	10.0	1.0	3.3	1.0

V(F). Planned Program (Activity)

1. Activity for the Program

The Water Quality and Quantity Program will focus on the following:

1. Educate agriculture producers to increase acceptance of BMPs that protect and improve water quality.
2. Educate homeowners to increase acceptance of BMPs that prevent water pollution from the homestead, as through the Home-A-Syst and Coast-A-Syst programs.

3. Educate the public on how their different land-use practices impact the quality and quantity of water in urban streams.
4. Develop and deliver educational programming on stream restoration and water quality protection.
5. Develop participation in water quality volunteer groups, and train county volunteers to deliver WQ programming
6. Present water quality and NPS pollution education for municipal and local government officials, as using Project NEMO.
7. Design, demonstrate and promote the installation of riparian buffers and other environmentally appropriate plantings to protect water quality.
8. Promote environmentally sound natural resource recreation and tourism opportunities in South Carolina.
9. Conduct field research focused on toxicity of metals and pesticides and on TMDL watershed modeling.
10. Establish an environmental radiochemistry lab.
11. Conduct a literature investigation on groundwater radionuclides in the Edisto River Basin.
12. Collect about 60 groundwater samples and conduct analyses.
13. Conduct a radioactivity survey.

2. Type(s) of methods to be used to reach direct and indirect contacts

Extension

Direct Methods	Indirect Methods
<ul style="list-style-type: none"> ● Education Class ● Workshop ● Group Discussion ● One-on-One Intervention ● Demonstrations 	<ul style="list-style-type: none"> ● Public Service Announcement ● Newsletters ● TV Media Programs ● Web sites other than eXtension

3. Description of targeted audience

The target audience includes farm and forest landowners, Extension agents, and administrators, natural resource professionals, Land management agency personnel, and user groups, nature-based tourism operators/industry, South Carolina citizens, tourists, children in school, after-school, summer and 4-H programs, agents and volunteers, urban, suburban and rural residents, farmers, ranchers, poultry and swine producers, foresters urban agents, agency personnel, urban planners and land owners/managers, municipal officials, and local community groups statewide, managers, government officials, and recreation and tourism operators.

V(G). Planned Program (Outputs)

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
 - Direct Adult Contacts
 - Indirect Adult Contacts
 - Direct Youth Contacts
 - Indirect Youth Contact
 - Number of patents submitted
 - Number of peer reviewed publications
- Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(H). State Defined Outputs

1. Output Measure

- Disclosures
 - Licenses
 - Number of people completing educational workshops
- Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(I). State Defined Outcome

O. No	Outcome Name
1	Number of people gaining knowledge
2	Number of people using practices learned

Outcome # 1

1. Outcome Target

Number of people gaining knowledge

2. Outcome Type : Change in Knowledge Outcome Measure

2012:3550 2013:3550 2014:4050 2015:5050 2016:6000

3. Associated Knowledge Area(s)

- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 131 - Alternative Uses of Land
- 133 - Pollution Prevention and Mitigation
- 134 - Outdoor Recreation

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Research

Outcome # 2

1. Outcome Target

Number of people using practices learned

2. Outcome Type : Change in Action Outcome Measure

2012:2210 2013:2300 2014:2300 2015:2600 2016:2600

3. Associated Knowledge Area(s)

- 112 - Watershed Protection and Management
- 131 - Alternative Uses of Land
- 133 - Pollution Prevention and Mitigation
- 134 - Outdoor Recreation

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Research

V(J). Planned Program (External Factors)

1. External Factors which may affect 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.)

Description

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

V(A). Planned Program (Summary)

Program # 4

1. Name of the Planned Program

Food Safety and Nutrition

2. Brief summary about Planned Program

Nutrition education programs for general audiences will focus on the topic of preventing chronic diseases through eating according to the MyPyramid and the Dietary Guidelines for Americans. EFNEP is a federally funded nutrition education program for children, youth and families with limited resources and is administratively supported by the Clemson and South Carolina State University Extension Services. EFNEP helps persons develop the knowledge, skills, attitudes, and behavior needed to improve their diet. Families learn to make informed choices about low-cost, nutritious foods; to better manage family finances; and to become more self-sufficient. Families and youth are taught individually or in small groups by Clemson EFNEP nutrition educators. Paraprofessional instructors are trained in basic nutrition and food-related topics by Extension nutrition specialists from both institutions. Many EFNEP nutrition educators are hired from the community in which they work. EFNEP currently is located in twenty six counties in South Carolina.

The Food Safety Program will feature the Serving Safe Food Curriculum from ServSafe. Agents certified as ServSafe Food Protection Managers will teach proper cleaning, and sanitizing, safe handling of food, correct temperatures, proper personal hygiene, as well as other aspects of food safety. Agents will assist entrepreneurs and food businesses with food safety issues, teach food service managers via train-the-trainer programs and assist managers in training their employees.

Research will focus on developing nanotechnology applications for food safety and quality, optimizing antimicrobial and antioxidant packaging films for foods, and developing biopolymer film applications for foods. Research will seek out new antimicrobials that can be used to control harmful microbes in foods and to look for DNA sequences that can be used to construct genetic transfer systems for gene delivery. Research will review the historical patterns in the formulation and implementation of U.S. nutrition policies in South Carolina to address the long-term problems in implementation of federal nutrition guidelines in the state. Research will assess the contribution of ceftiofur treatment of food animals to the acquisition and dissemination of ceftriaxone-resistant Salmonella, and the impact of antibiotic use on the microbiological safety of food.

Alternative food packaging systems for thermally processed, shelf-stable, low acid canned foods will be examined. Work will continue on developing a rapid method to accurately screen fruits and vegetables for the presence of organochlorine and organophosphorous pesticides, developing new diagnostic procedures for animal pathogens, especially those with recognized or predicted zoonotic potential, and on metabolic profiling in an attempt to manage, treat and/or diagnose infections. Work will also continue on the quality and microbiological safety of raw and fully-cooked poultry, poultry products and shell eggs.

Establishment of a nutrition Extension Service activity within limited-resource communities to promote lifestyle behaviors, which may prevent the development of chronic diseases. A Center of Excellence in Health Disparity and Outreach and Support will be developed to establish a degree program at the undergraduate level in public health. Research will also provide help in minimizing risks of harmful pathogens in the food supply.

3. Program existence : Intermediate (One to five years)

4. Program duration : Medium Term (One to five years)

5. Expending formula funds or state-matching funds : Yes

6. Expending other than formula funds or state-matching funds : Yes

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
503	Quality Maintenance in Storing and Marketing Food Products	5%	5%	5%	5%
703	Nutrition Education and Behavior	30%	30%	30%	30%
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	30%	30%	30%	30%
723	Hazards to Human Health and Safety	30%	30%	30%	30%
724	Healthy Lifestyle	5%	5%	5%	5%
	Total	100%	100%	100%	100%

V(C). Planned Program (Situation and Scope)

1. Situation and priorities

According to public health and food safety experts, 76 million illnesses in this country can be traced to food-borne bacteria each year. Moreover, the Food and Drug Administration estimates that two to three percent of all food-borne illnesses lead to secondary long-term illnesses. Food Marketing Institute research shows that consumers know food safety is important and know they personally should observe sound food-handling practices. However, it also shows either they do not fully comprehend some of the most important messages or they fail to use food safety measures. For example, 85% of consumers understand the importance of washing hands vigorously when handling food, but only 65% always do so.

The need to constantly communicate food safety messages is underlined by continued changes in food safety recommendations for both consumers and the food service industry. There is a need to increase food safety through improved processing and packaging, screening vegetables for pesticides and developing new diagnostic procedures for animal pathogens. Travel and tourism and the related retail food service industry is South Carolina's largest economic driver. Training retail managers and employees in safe food handling practices is key to maintaining a healthy tourism experience and to repeat visitors.

Poor nutrition and physical inactivity are primary risk factors in the development of obesity, heart disease, some cancers, hypertension and diabetes. The number of children who have high blood lipids, have clinically diagnosed hypertension and have developed Type II diabetes (typically seen in adults) is sharply on the rise. All of the mentioned illnesses are secondary to obesity, poor nutrition and physical inactivity. Childhood obesity is a serious health issue, with the prevalence reaching epidemic proportions and more than doubling in the last three decades, with even higher rates among subpopulations of minority and

economically disadvantaged children and adolescents.

The economic impact of obesity and associated chronic diseases has been estimated to be approximately \$1 billion in South Carolina alone and \$100 billion nationwide. Obesity in children and adolescents has been associated with several chronic disease states including: diabetes, asthma, sleep apnea, and gall bladder disease. Several studies document the prevalence of type II diabetes is increasing among children and adolescents. Children who are overweight are at increased risk of becoming overweight or obese adults. Nationally, the prevalence of adult obesity increased 75% between 1991 and 2000 (from 22.9% to 30.5%). Adult obesity is an important risk factor for several chronic disease conditions. Approximately 14% of the South Carolina population is low income and at higher risk for food insecurity obesity. The causes of obesity are complex and include genetics, lack of physical activity and high-fat, energy-dense foods, which are readily accessible, inexpensive, heavily advertised, and palatable. Furthermore, individuals who are overweight may not eat more than normal weight individuals but, instead, may have a positive energy balance due to low energy output.

A recent review of the dietary intake, food resource management practices, nutrition practices and food safety practices of parents in South Carolina reveals that only 14% demonstrated acceptable food resource management practices; only 9% demonstrated acceptable nutrition practices; only 46% demonstrated acceptable food safety practices; only 27.4% consume an adequate number of servings of breads and cereals; only 20.8% consume an adequate number of servings of fruit; only 20.8% consume an adequate number of servings of vegetables; only 10.1% consume an adequate number of servings of dairy; and, only 2.4% consume a food pattern with a 6-2-3-2-2 pattern of intake from the food groups. Only 12% of Americans eat a healthy diet consistent with federal nutrition recommendations. The typical American diet is too high in saturated fat, salt, and refined sugar and too low in fruits, vegetables, whole grains, calcium, and fiber. Only 2% of school-aged children meet the Food Guide Pyramid serving recommendations for all 5 major food groups, and not more than 30% eat the recommended amount from any 1 of the 5 major food groups.

2. Scope of the Program

- In-State Extension
- In-State Research
- Multistate Research

V(D). Planned Program (Assumptions and Goals)

1. Assumptions made for the Program

Delivery of nutrition and food safety information via volunteers and train-the-trainer efforts is an important extender of resources. Teaching children skills to maintain healthy dietary habits and active lifestyles helps prevent obesity not only in youth, but also in adult life. However, many of the interventions aimed at preventing obesity in children and adults have not been particularly successful. There is a need to develop and implement innovative interventions designed to prevent childhood obesity.

While income is one resource that correlates with higher prevalence of obesity, other resources (when limited) also impact obesity. Many families have limited time for food purchasing and preparation; limited access and availability to foods; limited food preparation skills; limited knowledge of proper nutrition; and have a limited budget.

It is well established that weight status is partly due to genetic influences. However, the family (parental

feeding practices, food purchasing and preparation practices) and school/childcare environments can also exert strong influences on children's food availability, eating behaviors, and physical activity levels, which may impact children's weight status. Nevertheless, many adults have limited food purchasing and preparation skills, which reduces the variety of foods consumed and leads to a low intake of certain foods that contribute to a healthy diet. Food purchasing and preparation skills are needed to prepare low-cost, nutritious meals that meet current dietary recommendations.

Research into films, antimicrobials and nanotechnology applications will produce results that will enhance food safety in South Carolina, as will the ability to screen for pesticides on vegetables and detect animal pathogens.

Work will also continue on the quality and microbiological safety of raw and fully-cooked poultry, poultry products and shell eggs.

2. Ultimate goal(s) of this Program

The overall nutrition goal is to reduce the prevalence of overweight and obesity and the associated health risks and to promote healthy lifestyles of South Carolina adults and to improve the quality and safety of food for citizens of South Carolina. A multi-faceted approach will be used, focusing on the development and promotion of lifelong healthy eating and physical activity behaviors for children, youth, and families and on working with partners to change the nutrition and fitness environment.

V(E). Planned Program (Inputs)

1. Estimated Number of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890
2012	10.0	3.0	4.2	2.0
2013	10.0	3.0	4.2	2.0
2014	10.0	3.0	4.2	2.0
2015	10.0	3.0	4.2	2.0
2016	11.0	3.0	4.2	2.0

V(F). Planned Program (Activity)

1. Activity for the Program

Nutrition education will center on the Food Guide Pyramid and the Dietary Guidelines for Healthy Americans. Special focus will be given to programming in the prevention of childhood obesity, increasing physical activity in all ages, and the development of food preparation skills that fit current nutritional needs and lifestyle. Safe handling of food will be taught to handlers in the food service industry and the general public. Commercial food processors will be targeted in an effort to improve commercial food processing efficiencies and effectiveness/develop new markets/improve commercial handling, processing,

preservation and packaging to provide safe and high quality foods. Attention will be given to providing consumers with scientifically based, reasonable nutrition and food safety information via the media. Food-borne illnesses will be defined and conditions discussed that encourage bacteria growth. Most common food-borne pathogens, additives, preservatives and basic kitchen safety techniques will be taught. The following activities will be conducted:

- Communities will form coalitions that focus on improving the nutritional health and fitness of their citizens.
- Participants will make healthy food choices after participating in Extension food/nutrition programs.
- Participants will develop skills in procuring of food for good health.
- Participants will demonstrate skills in preparing food; emphasizing healthy preparation techniques.
- Participants will increase knowledge and skills for the safe handling of food.
- Managers and supervisors will be certified to train food handlers in safe food handling techniques.
- Food handlers will practice safe food handling techniques.
- Volunteer food handlers at temporary events will increase their knowledge in safe food handling.
- Regulatory compliance will be promoted
- Specialists will assist in the development of new food businesses.
- Public understanding of technology, with an emphasis upon food biotechnology will increase.
- Media outlets will utilize Extension food safety and nutrition resources.
- Outlets for publication will distribute or sell Extension food safety and nutrition resources.

Research is proceeding on the DNA of a bacterium widely used as starters in yogurt and cheese. By understanding its genetic characteristics of this bacterium, scientists can improve the commercial usefulness, such as fermentation rate, flavor and sweetness.

Experiments with cottage cheese showed that as the numbers of bacterium increased, the numbers of spoilage organisms decreased. The results indicate that bacterium could help control spoilage in cottage cheese, potentially extending its shelf life. Related research also may lead to health benefits. Unlocking the genetic code may uncover DNA fragments that can be used to make proteins that attack bacterial infections. The proteins, called bacteriocins, are potentially more effective than antibiotics. Disease-causing bacteria can become res. Finding ways to make food healthier, safer and less expensive is a priority around the world. Clemson research in this area can benefit both food producers and consumers.

1890 Research is continuing to develop nanomaterials based sensors of unusual non B-form DNA with emphasis on DNA sequences that are implicated in human diseases. Synthesized colloidal semiconductor nanomaterials will be activated by cationic surface groups and characterized spectroscopically. DNA quantum do interactions will be studied.

Also, research is conducted to investigate the viability and evaluation of a large-scale implementation of innovative hybrid agriculture transit system, the Mobility Allowance Shuttle transit (MAST) service. The research plans to improve the rural agriculture transit network designs and system operations. The results will be critical to addressing environmental, health and human nutrition issues.

2. Type(s) of methods to be used to reach direct and indirect contacts

Extension

Direct Methods	Indirect Methods
-----------------------	-------------------------

<ul style="list-style-type: none">● Education Class● Workshop● Group Discussion● One-on-One Intervention● Demonstrations	<ul style="list-style-type: none">● Public Service Announcement● Billboards● Newsletters● TV Media Programs● Web sites other than eXtension
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3. Description of targeted audience

The target audience includes community leaders, agencies, policy makers, general public, EFNEP - limited resource families, food service managers, supervisors, food handlers, producers, commercial food handlers, processing and packaging industry, entrepreneurs seeking to start food businesses or improve existing food business, media and other marketing contacts, and publication outlets - doctors' offices and grocers.

V(G). Planned Program (Outputs)

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
 - Direct Adult Contacts
 - Indirect Adult Contacts
 - Direct Youth Contacts
 - Indirect Youth Contact
- Number of patents submitted
- Number of peer reviewed publications

Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(H). State Defined Outputs

1. Output Measure

- Licenses
- Disclosures
- Number of people completing educational workshops

Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(I). State Defined Outcome

O. No	Outcome Name
1	Number of participants reporting increased knowledge in safe food handling and nutrition
2	Number of managers/supervisors/food handlers completing educational program and receiving a course certificate
3	Number of coalitions formed (partners, public/private, academic)
4	Number of participants reached with food safety information by volunteers who participated in an Extension training program
5	Number of new or improved food products entering the market as a result of adopting recommended practices
6	Number of people reached through media outlets that utilize Extension food safety, food biotechnology and nutrition resources

Outcome # 1

1. Outcome Target

Number of participants reporting increased knowledge in safe food handling and nutrition

2. Outcome Type : Change in Knowledge Outcome Measure

2012:15500 2013:15500 2014:15500 2015:15500 2016:16500

3. Associated Knowledge Area(s)

- 503 - Quality Maintenance in Storing and Marketing Food Products
- 703 - Nutrition Education and Behavior
- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins
- 723 - Hazards to Human Health and Safety
- 724 - Healthy Lifestyle

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension
- 1890 Research

Outcome # 2

1. Outcome Target

Number of managers/supervisors/food handlers completing educational program and receiving a course certificate

2. Outcome Type : Change in Knowledge Outcome Measure

2012:200 2013:200 2014:200 2015:200 2016:200

3. Associated Knowledge Area(s)

- 703 - Nutrition Education and Behavior
- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins
- 723 - Hazards to Human Health and Safety

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

Outcome # 3

1. Outcome Target

Number of coalitions formed (partners, public/private, academic)

2. Outcome Type : Change in Action Outcome Measure

2012:6	2013:6	2014:6	2015:6	2016:6
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3. Associated Knowledge Area(s)

- 703 - Nutrition Education and Behavior
- 723 - Hazards to Human Health and Safety

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension
- 1890 Research

Outcome # 4

1. Outcome Target

Number of participants reached with food safety information by volunteers who participated in an Extension training program

2. Outcome Type : Change in Knowledge Outcome Measure

2012:200	2013:200	2014:200	2015:200	2016:200
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3. Associated Knowledge Area(s)

- 503 - Quality Maintenance in Storing and Marketing Food Products
- 703 - Nutrition Education and Behavior
- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins
- 723 - Hazards to Human Health and Safety
- 724 - Healthy Lifestyle

4. Associated Institute Type(s)

- 1890 Extension

Outcome # 5

1. Outcome Target

Number of new or improved food products entering the market as a result of adopting recommended practices

2. Outcome Type : Change in Condition Outcome Measure

2012:17 2013:18 2014:19 2015:20 2016:20

3. Associated Knowledge Area(s)

- 503 - Quality Maintenance in Storing and Marketing Food Products
- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 6

1. Outcome Target

Number of people reached through media outlets that utilize Extension food safety, food biotechnology and nutrition resources

2. Outcome Type : Change in Knowledge Outcome Measure

2012:45000 2013:52000 2014:60000 2015:100000 2016:100000

3. Associated Knowledge Area(s)

- 503 - Quality Maintenance in Storing and Marketing Food Products
- 703 - Nutrition Education and Behavior
- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins
- 723 - Hazards to Human Health and Safety
- 724 - Healthy Lifestyle

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

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

Description

The goal is for county faculty to be supported entirely through county monies, generated funds, gifts and/or grants and contracts and for new food safety and nutrition county faculty to be added through that same means. Changes in public policy directed toward obesity, nutrition and fitness, and food safety issues will impact availability of funding for community-based translational research and outreach in food safety and nutrition and may necessitate additional activities in any one area. For instance, South Carolina has required every school to implement a program in nutrition and fitness.

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

CUMIS evaluations/reporting; other methods as funding is secured to support them. Standardized tests for food safety trainings.

V(A). Planned Program (Summary)

Program # 5

1. Name of the Planned Program

Community, Leadership, and Economic Development

2. Brief summary about Planned Program

Research efforts will continue on entrepreneurship and community-based economic development in the state. This will include an examination of the emerging opportunities and threats to the economic structure of rural markets, with a focus on electronic commerce, financial liberalization and health care. In related work, the consumer behavior, market coordination and performance of the consumer oriented fruit and vegetable sector will be assessed in an effort to identify tools for community level entrepreneurs.

Research will attempt to determine what types of development strategies are available in South Carolina, who benefits, the ingredients necessary for successful business development and the development capacity of local governments.

Research is being conducted on the potential of educational attainment, business climate and investment-based economic development in South Carolina. The goal is to analyze the factors that affect the educational attainment and investment and develop a model for South Carolina to accentuate the role of education and investment as sources of economic development.

An investigation of political participation, representation, mayoral leadership and the distribution of public service in rural communities in South Carolina is taking place. The study will examine the distribution of municipal services in small towns in South Carolina. Also, research on bankruptcy filings in South Carolina under the new bankruptcy law is underway.

Dynamic growth in the state and across the region has presented the need for research into balancing natural resource recreation, recreation management, human well being and community resilience.

Community Leadership Development encompasses leadership, team building, and consensus development activities. The CLED program offers community leadership development training, facilitation of strategic planning for economic development, public issues education, youth leadership, and serves as a collaborative agency with other leadership program sponsors. Board training for public officials and nonprofit organizations are offered at the community and state-wide level. Leadership and citizenship development also includes youth, youth-at-risk, and limited resource residents in inner-city and rural settings. The South Carolina Community Development Collaborative is a partnership of community, municipal and government organizations partnering to leverage their knowledge and resources to promote a holistic approach to sustainable community development. Within the collaborative, organizations identify opportunities for partnership, funding and learning to increase individual organization and member capacity in assisting communities. Through the sharing of assets, the members serve as a "resource bank" to meet community needs. The CLED program will also promote community enhancement that is linked to community image, sustainable economic development, and improved quality of life. The Clemson Institute for Economic and Community Development provides educational, policy formation, and service function as a collaborative and facilitative entity to extension educators, citizens, and others. A skilled workforce has been identified as one of the key elements in attracting new investment that leads to better paying sustainable jobs. In cooperation with the South Carolina Commission of Employment Security and local Workforce Investment Boards, the needs for different workforce skills will be documented and

matched to characteristics of the local workforce. The Brownsfields Redevelopment program will serve to remediate abandoned, idle or underused industrial or commercial property where expansion or redevelopment is complicated by real or perceived environmental contamination.

The Northeastern Corridor of Orangeburg Community Development Corporation (NCO CDC) is funded from the Department of Housing and Urban Development (HUD) under its Historically Black Colleges and Universities (HBCU) grant. The program is designed to revitalize the communities that surround HBCU's. Meetings and forums were held to determine what initiatives residents felt were needed to make their communities viable. Affordable housing was considered the most critical need as well as safe and decent housing, youth programs, elimination of drugs and other illicit activities and economic development. Based on the needs identified, the agency partnered with SC Housing Finance and Development Authority, US Rural Development, Orangeburg County and other civic organizations to provide home buyer education, home rehabilitation and homeownership opportunities.

The CD Certificate Program is designed in partnership with Benedict College School of Community Development and the South Carolina Association of Community Development Corporations Incorporated to provide practitioners in local communities with the knowledge, skills and abilities to successfully design, develop and establish successful economic and community development initiatives in their local communities. The program is designed to provide practitioners competencies in the following areas: community needs assessment and asset mapping, leadership models and roles, building effective partnerships, developing effective advancement programs, building effective political relationships, establishing effective public/media/community relations, and designing and developing effective community development projects.

3. Program existence : Mature (More than five years)

4. Program duration : Long-Term (More than five years)

5. Expending formula funds or state-matching funds : Yes

6. Expending other than formula funds or state-matching funds : Yes

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
608	Community Resource Planning and Development	15%	15%	15%	15%
609	Economic Theory and Methods	10%	10%	10%	10%
610	Domestic Policy Analysis	15%	15%	15%	15%
801	Individual and Family Resource Management	15%	15%	15%	15%
802	Human Development and Family Well-Being	15%	15%	15%	15%
803	Sociological and Technological Change Affecting Individuals, Families, and Communities	15%	15%	15%	15%
806	Youth Development	15%	15%	15%	15%
	Total	100%	100%	100%	100%

V(C). Planned Program (Situation and Scope)**1. Situation and priorities**

South Carolina's rural economy continues to be impacted by the loss of textile employment. Urban growth and sprawl continues to draw on the rural labor force. The infrastructure needs of rural communities, to include education, continue to grow as the tax base weakens.

The state of South Carolina has undergone significant job losses from plant closings and relocation of textile manufacturing to plants outside the US. The CLED program addresses the need for increased leadership training and development in South Carolina's rural, suburban, city, and transitional areas. Transitional areas include counties and communities at the fringes of metropolitan sprawl or changing neighborhoods. The target areas often lack progressive leadership that looks beyond local political boundaries. Projects such as the Palmetto Leadership program and Public Issues Education are designed to assist leaders with local planning to find new revenue sources in rural counties that have a low tax base and relatively few income producing resources. Extension educational programs foster teamwork, planning, and regionalism to address effectively the locale's economic and quality of life concerns. The community leadership program provides a facilitated and constructive forum where conflicting interests and policies can be addressed through the action plans of established and emerging leaders. The programs also help create the next generation of informed leaders.

There is a need to revitalize affordable housing, and make available safe and decent housing, youth programs, eliminate drugs and other illicit activities and strengthen economic development in communities where needed.

Policy issues and concerns of low and moderate income residents as they relate to the distribution of local public services will be reviewed and analyzed. The distribution of service delivery, role performance and officials' perceptions will be collected.

2. Scope of the Program

- In-State Extension
- In-State Research
- Multistate Research

V(D). Planned Program (Assumptions and Goals)

1. Assumptions made for the Program

The development of targeted industry strategies, community leadership development and overall strategies for economic development can spark entrepreneurial innovation and attract jobs.

- * Training programs can help build leadership skills of local citizens.
- * Trained leaders can promote informed change that produces community-friendly public policies.
- * A properly trained population can enhance workforce preparedness and promote economic development in communities.
- * Engaging communities through collaborative efforts and partnership increases buy-in, and significantly increases the potential for program and community success.
- * The power to change communities rest within the communities.
- * Communities are best able to define what success looks like.

2. Ultimate goal(s) of this Program

The goals of the program are to strengthen the economic competitiveness of rural areas, improve the business climate and create economic opportunities and improve the quality of life for rural residents. The program will provide training for citizens to enhance leadership, communication, team building and strategic planning efforts. It will also provide communities with tools to develop a vision for transformation to a future state of increased livability, prosperity and sustainability. The program will revitalize communities and provide affordable housing, safe and decent housing, youth programs, eliminate drugs and other illicit activities in communities, as well as economic development.

V(E). Planned Program (Inputs)

1. Estimated Number of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890
2012	14.0	5.0	3.0	2.0
2013	14.0	5.0	3.0	2.0
2014	14.0	5.0	3.0	2.0
2015	14.0	5.0	3.0	2.0
2016	14.0	5.0	3.0	2.0

V(F). Planned Program (Activity)

1. Activity for the Program

Research projects will be conducted. Joint activities with Extension will be implemented, publications will be written and partnerships will be established. The following activities will be implemented:

1. Conduct leadership programs and workshops in counties or municipalities, teaching facilitation skills and best practices of conflict resolution to be used in public meetings and public forums
 2. Communicate leadership principles through printed materials
 3. Collaborate with organizations to offer leadership and team building programs
 4. Promote participation in task forces/committees that have programmed outcomes
 5. Offer board development training and organizational capacity building to nonprofit organizations annually
 6. Promote the participation of youth and adults in Intergenerational Service Learning or Community Youth Development activities and in Children, Youth and Families At Risk (CYFAR) Extension programming
 7. Convey community and regional economic impact assessment data to business leaders and
 8. Provide local leaders with local socio-economic trend and pattern data to support local economic development strategic planning efforts agency representatives and association members (television, radio, media) that promote understanding of public issues
 9. Review federal and state legislation and offer critiques to advance understanding among
 10. Prepare materials for public distribution in print or through electronic means
 11. Engage citizens in community promotion projects annually
 12. Facilitate the work of task forces/groups that formulate action plans and policies
 13. Communicate community improvement accomplishments through news releases, fact sheets, reports, articles, and newsletters
- Conduct design/master plan Charrettes in all of the states distressed counties (The Charrette is a tool that allows CIECD in a collaborative manner to

interact

with communities in designing a master plan of transformative change. The essential elements of the Charrette are the use of experts in areas of landscape design, community design,

visioning

and architecture with vital input from the community to create the transformative plan or change)

14. Establish a Brownfields Community Redevelopment Center
15. Address issues associated with youth through a Youth Empowerment/Leadership program
16. Increase statewide collaborations by continuing to share information with potential partners and engaging them in community projects
17. Provide leadership in cultural and environmental stewardship
18. Convene practitioners and researchers in an interactive environment that results in innovative, sustainable solutions
19. Foster research, collaborations, capacity building and leadership for sustainable community and economic development
20. Projections will be made for labor needs by occupational category under current situations and

for

proposed projects (The estimates will be linked to process-based models and tied to industry targeting recommendations. The information generated will be critical in assisting local organizations with training responsibilities to develop a local workforce capable of competing in

the

knowledge-based economy. Other possible areas of work include evaluating and working to strengthen linkages between rural and urban-based clusters in terms of backward and forward

linkages.)

21. Provide home buyer education, home rehabilitation and homeownership opportunities.

22. Develop business plans

2. Type(s) of methods to be used to reach direct and indirect contacts

Extension

Direct Methods	Indirect Methods
<ul style="list-style-type: none"> ● Education Class ● Workshop ● Group Discussion ● One-on-One Intervention ● Demonstrations 	<ul style="list-style-type: none"> ● Public Service Announcement ● Billboards ● Newsletters ● TV Media Programs ● Web sites other than eXtension

3. Description of targeted audience

The target audience includes students, child care providers, limited-resource persons, community leaders, board/council members, nonprofit organization boards and groups, adults, youth, business and workforce preparation agencies and disadvantaged citizens and communities, state, federal, and local agency personnel, association members, citizens faced with public issues, and citizens engaged in economic and tourism development.

V(G). Planned Program (Outputs)

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
 - Direct Adult Contacts
 - Indirect Adult Contacts
 - Direct Youth Contacts
 - Indirect Youth Contact
- Number of patents submitted
- Number of peer reviewed publications

Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(H). State Defined Outputs

1. Output Measure

- Publications, business plans and housing grants
- Total number of people completing educational workshops
- Number of board members trained
- Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(I). State Defined Outcome

O. No	Outcome Name
1	Total number of people reporting increased knowledge as a result of participation in CLED activities
2	Number of facilitated public meetings addressing public issues
3	Number of printed materials used to promote understanding of public issues
4	Number of participants engaged in community promotion projects

Outcome # 1

1. Outcome Target

Total number of people reporting increased knowledge as a result of participation in CLED activities

2. Outcome Type : Change in Knowledge Outcome Measure

2012:9600 2013:10100 2014:10100 2015:10100 2016:10100

3. Associated Knowledge Area(s)

- 608 - Community Resource Planning and Development
- 803 - Sociological and Technological Change Affecting Individuals, Families, and Communities
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension
- 1890 Research

Outcome # 2

1. Outcome Target

Number of facilitated public meetings addressing public issues

2. Outcome Type : Change in Action Outcome Measure

2012:15 2013:15 2014:15 2015:15 2016:15

3. Associated Knowledge Area(s)

- 608 - Community Resource Planning and Development
- 803 - Sociological and Technological Change Affecting Individuals, Families, and Communities
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension
- 1890 Research

Outcome # 3

1. Outcome Target

Number of printed materials used to promote understanding of public issues

2. Outcome Type : Change in Knowledge Outcome Measure

2012:38 2013:43 2014:50 2015:0 2016:0

3. Associated Knowledge Area(s)

- 608 - Community Resource Planning and Development
- 803 - Sociological and Technological Change Affecting Individuals, Families, and Communities
- 806 - Youth Development

4. Associated Institute Type(s)

- 1890 Extension
- 1890 Research

Outcome # 4

1. Outcome Target

Number of participants engaged in community promotion projects

2. Outcome Type : Change in Action Outcome Measure

2012:200 2013:250 2014:250 2015:300 2016:400

3. Associated Knowledge Area(s)

- 608 - Community Resource Planning and Development
- 802 - Human Development and Family Well-Being
- 803 - Sociological and Technological Change Affecting Individuals, Families, and Communities
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

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

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

Description

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

V(A). Planned Program (Summary)

Program # 6

1. Name of the Planned Program

4-H Youth Development and Families

2. Brief summary about Planned Program

The 4-H and Youth Development Program in South Carolina is a community based experiential educational program dedicated to the overall positive development of the youth of South Carolina. The 4-H Program seeks to provide a community environment that supports the development of the positive assets of youth and development of life skills so that youth may become competent, caring and contributing adult members of society. In order to accomplish this goal, the SC 4-H Program utilizes an experiential subject matter oriented program that supports the current state school curriculum in primarily afterschool, out-of-school club units, camps and short-term special interest programs. Local adult and teen volunteer leaders will be recruited and trained to provide land grant based subject matter curriculum and educational experiences.

Action Research will investigate the effectiveness of differentiated action research use and instructional beliefs and skill practices of nine routines among pre and in-service teachers in rural schools. The instrument was administered to 12 pre and in-service 4th and 5th grade teachers in five school districts. Another research project will focus on the learning styles and preferences in a graduate blended learning course. The project will explore the differences between adult nontraditional students utilizing a blended learning course and students attending the traditional face-to-face course in a counseling theories and techniques course. Research is, also, being conducted using qualitative methods to obtain data relevant to parents' participation in their children's education in targeted school districts. Parents become members of specific focus groups based on the school their child attends and the child's grade level.

3. Program existence : Mature (More than five years)

4. Program duration : Long-Term (More than five years)

5. Expending formula funds or state-matching funds : Yes

6. Expending other than formula funds or state-matching funds : Yes

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
801	Individual and Family Resource Management	4%	4%	4%	4%
802	Human Development and Family Well-Being	15%	15%	15%	15%
803	Sociological and Technological Change Affecting Individuals, Families, and Communities	10%	10%	10%	10%
806	Youth Development	71%	71%	71%	71%
	Total	100%	100%	100%	100%

V(C). Planned Program (Situation and Scope)

1. Situation and priorities

School readiness improved during the late 1990s, for the first time, since the early 1980s, as assessed by teachers. Large percentages of students are still placed in special education, even though many of them are recognized as disabled only in academic learning, but not in other areas of life. While many students are making solid progress in school, too many others are performing below minimum standards of the basic academic skills. Statewide, in the 8th grade, 29% perform below the basic level on the NAEP in math as compared with 33.7% in the state on the PACT test, and 33% statewide below basic on NAEP in reading as compared with 25.3% in the state on PACT. One of our priorities is to coordinate and promote the parallel utilization of 4-H curriculum with the state approved public school curriculum. Single parent families have increased. More and more parents of young children are working. Poverty declined dramatically in the 1970s, but has not changed much for young children since then, especially for the growing numbers of children in families headed by single mothers. Increasingly, parents must divide their time between children and employers. In 2000, 7.1% of all children did not live with their natural parents. Approximately 4.9% of all children lived with relatives and 1.6% lived with non-relatives. Another one of our priorities is to enhance family well-being for all families through parent and youth involvement in 4-H.

In addition, volunteers will be equipped for leadership roles, will train youth with new knowledge and skills, and will make positive impacts in their communities. An effective volunteer management system for 4-H Youth Development will be established and sustained. County programs will provide a wide variety of experiential educational opportunities and curricula through a number of different delivery modes such as clubs, short term interest programs, camps, etc., dependent upon their personnel and budgets. Emphasis will be on volunteer-led educational programming that provides productive youth-adult partnerships. Statewide curriculum training for volunteers, staff and youth will be provided for replication at the club and county levels. Programs designed to meet the needs of limited-resource audiences will be provided. Money management skills will be taught and community partnerships will be created and strengthened.

Action research is primarily practitioner driven. It is a method for teachers to examine outcomes for students. It is a method of trying out ideas in practice as a means of increasing knowledge about and/or improving curriculum, teaching and learning. Also, it is important to discover the dynamics of relationships

identified through online instructional features that are important for the creation of a successful educational program for meeting diverse needs of adult learners.

2. Scope of the Program

- In-State Extension
- In-State Research

V(D). Planned Program (Assumptions and Goals)

1. Assumptions made for the Program

Due to a rapidly changing, complex American society and a media-reinforced "me" culture, youth need experience and training to become contributing, effective members of their communities. The 4-H program provides opportunities for youth to serve as partners in planning, implementing and evaluating the overall program as partners in the program, not merely recipients. Strong families provide children with a sense of belonging and the security of being loved and nurtured. Children from families without this strength and security often are at risk. 4-H seeks to support the family unit and strengthen the individual child, building upon the assets that are present. Far fewer youth, including 4-H members, now live on farms or require knowledge of crops and animal husbandry practices to survive. But learning about living things is just as critical today because society as a whole has lost touch with agriculture and food production. Although our society expresses a desire for open space and abundant natural resources, citizens lack a working knowledge of natural resources and an understanding of their role in environmental stewardship. 4-H seeks to create an awareness and appreciation of the natural environment and an understanding of individual and personal responsibility of every citizen to maintain the natural resources.

Youth face the challenge of balancing and making healthy decisions with the desire to feel part of a group. 4-H provides a variety of programs, events and activities designed to increase the ability of youth to make wise decisions. Living successfully in the information age requires that youth be knowledgeable and skilled in communicating their ideas and beliefs. This includes the ability to speak with poise and confidence in the public arena, effectively and efficiently communicate utilizing computer technology and through standard written formats. 4-H programs provide opportunities for youth to become proficient in many communications modes. Youth learn about the environment, other subject matter, and develop important life skills through experiential learning programs that use outdoor settings and/or residential environments. Trained adult volunteers are critical in providing a multiplying effect of limited Extension 4-H professional staff. To maximize the efforts of 4-H staff to reach a large and diverse youth audience, 4-H volunteers are utilized to lead 4-H clubs and county 4-H events and activities.

The research may result in an opportunity for adult learners to receive higher education or an advanced degree. Education will empower the community and its people. Activities may be designed to promote critical thinking, problem-solving skills, and inductive and deductive reasoning skills as a basis for helping students to become better learners and achievers.

2. Ultimate goal(s) of this Program

The overall goal for the SC 4-H Program is the development of communities of young people in South Carolina who are learning leadership, citizenship and life skills. The 4-H Program seeks to achieve this goal by creating healthy experientially educational environments in the local community, which supports the positive development of young people ages 5 to 19.

Youth ages 5 to 19 will develop life skills and the corresponding competency, coping and contributory skills

within the content areas of Leadership, Personal Development and Citizenship, Communication and Expressive Arts, Science, Technology and Engineering, Nutrition, Fitness & Safety Education, Food and Nutrition through EFNEP for Children and Youth, Plants and Animals, Natural Resources and Shooting Sports, and Resource Management.

Youth ages 5-8 years of age, will develop age appropriate life skills and the corresponding competency, coping and contributory skills within a variety of 4-H subject areas.

Youth will develop life skills and the corresponding competency, coping and contributory skills through a variety of Youth Camping opportunities. The SC 4-H Youth Development program will recruit, train and manage a system of local adult and teen volunteer leadership who will work with youth ages 5-19.

Trained SC 4-H Volunteers and staff will provide land grant based subject matter curriculum and educational experiences so that youth might develop specific life skills, and will provide documentation to excel at a level of educational advancement in the field of action research. Also, to provide a successful educational program for meeting diverse needs of adult learners.

V(E). Planned Program (Inputs)

1. Estimated Number of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890
2012	30.0	16.0	0.0	2.5
2013	30.0	16.0	0.0	2.5
2014	30.0	16.0	0.0	2.5
2015	30.0	16.0	0.0	2.5
2016	30.0	16.0	0.0	2.5

V(F). Planned Program (Activity)

1. Activity for the Program

County programs will provide a wide variety of experiential educational opportunities and curricula through a number of different delivery modes such as clubs, short term interest programs, camps, etc. dependent upon their personnel and budgets. Emphasis will be on volunteer led educational programming that provides productive youth/adult partnerships. In addition, statewide curriculum training for volunteers, staff and youth will be provided for replication at the club and county levels. Pre-service teachers will work with rural school districts. The program will explore differences between adult nontraditional students utilizing a blended learning course and students attending the traditional face-to-face courses in a counseling theories and techniques course. Also, focus group sessions will be held related to parental involvement in school districts.

2. Type(s) of methods to be used to reach direct and indirect contacts

Extension

Direct Methods	Indirect Methods
<ul style="list-style-type: none"> ● Education Class ● Workshop ● Group Discussion ● One-on-One Intervention ● Demonstrations ● Other 1 (mentoring) 	<ul style="list-style-type: none"> ● Public Service Announcement ● Billboards ● Newsletters ● TV Media Programs ● Web sites other than eXtension

3. Description of targeted audience

- a) All youth between the ages of nine and nineteen
- b) All youth between the ages of five and eight
- c) Parents and other adults interested in the development of South Carolina youth.
- d) 30-44 parent and young adult
- e) 45-64 Mature volunteer
- f) 65+ Grandparent and Senior Volunteer.
- g) Adult learners (college students)
- h) Teachers

V(G). Planned Program (Outputs)

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
 - Direct Adult Contacts
 - Indirect Adult Contacts
 - Direct Youth Contacts
 - Indirect Youth Contact
 - Number of patents submitted
 - Number of peer reviewed publications
- Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(H). State Defined Outputs

1. Output Measure

- Number of people participating in educational workshops conducted
- Total number of adult volunteers (including non-Extension staff) trained in club, school enrichment, and special interest program delivery and management in all 4-H project areas.
- Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(I). State Defined Outcome

O. No	Outcome Name
1	Number of trained adult volunteers and staff, (including non-Extension staff) who teach subject matter and life skills to youth, meeting S.C. educational standards by utilizing National 4-H Cooperative Curriculum System (4-HCCS) curriculum materials as available
2	Number of youth who gain knowledge in leadership and citizenship project areas
3	Number of youth participating in service learning projects for the community and to improve themselves, and help others.
4	Number of youth who gain knowledge and skills about plants, livestock and/or pets.
5	Number of youth who develop knowledge and skills in science, engineering, and technology (including electricity, computers, pontoon classroom, etc.).
6	Number of youth gain knowledge in nutrition and fitness
7	Number of youth who gain knowledge in natural resources and shooting sports
8	Number of youth who develop and improve communication skills through speaking and debating

Outcome # 1

1. Outcome Target

Number of trained adult volunteers and staff, (including non-Extension staff) who teach subject matter and life skills to youth, meeting S.C. educational standards by utilizing National 4-H Cooperative Curriculum System (4-HCCS) curriculum materials as available

2. Outcome Type : Change in Action Outcome Measure

2012:175 2013:175 2014:175 2015:175 2016:175

3. Associated Knowledge Area(s)

- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

Outcome # 2

1. Outcome Target

Number of youth who gain knowledge in leadership and citizenship project areas

2. Outcome Type : Change in Knowledge Outcome Measure

2012:1500 2013:1500 2014:1500 2015:1500 2016:1500

3. Associated Knowledge Area(s)

- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

Outcome # 3

1. Outcome Target

Number of youth participating in service learning projects for the community and to improve themselves, and help others.

2. Outcome Type : Change in Action Outcome Measure

2012:200 2013:200 2014:200 2015:200 2016:200

3. Associated Knowledge Area(s)

- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 4

1. Outcome Target

Number of youth who gain knowledge and skills about plants, livestock and/or pets.

2. Outcome Type : Change in Knowledge Outcome Measure

2012:14500 2013:16000 2014:16000 2015:16000 2016:16000

3. Associated Knowledge Area(s)

- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

Outcome # 5

1. Outcome Target

Number of youth who develop knowledge and skills in science, engineering, and technology (including electricity, computers, pontoon classroom, etc.).

2. Outcome Type : Change in Knowledge Outcome Measure

2012:1472 2013:1472 2014:1472 2015:1472 2016:1472

3. Associated Knowledge Area(s)

- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

Outcome # 6

1. Outcome Target

Number of youth gain knowledge in nutrition and fitness

2. Outcome Type : Change in Knowledge Outcome Measure

2012:10500 **2013:**12500 **2014:**12500 **2015:**12500 **2016:**12500

3. Associated Knowledge Area(s)

- 802 - Human Development and Family Well-Being
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

Outcome # 7

1. Outcome Target

Number of youth who gain knowledge in natural resources and shooting sports

2. Outcome Type : Change in Knowledge Outcome Measure

2012:2400 **2013:**2500 **2014:**3000 **2015:**3000 **2016:**3000

3. Associated Knowledge Area(s)

- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 8

1. Outcome Target

Number of youth who develop and improve communication skills through speaking and debating

2. Outcome Type : Change in Action Outcome Measure

2012:100 2013:115 2014:125 2015:125 2016:125

3. Associated Knowledge Area(s)

- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

- Economy
- Appropriations changes
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

Description

Foreseeable factors that might affect current plans for the SC 4-H Program include:

In the last two years, reductions in state appropriations have not been as bad as in the prior five years and expectations are currently more positive, but county staff reductions and retirements have dramatically changed the county delivery of 4-H. Financial pressures at the University level are placing 4-H in a soon to be self-sufficiency position. Member fees, member purchase of curriculum and rising event registration fees are causing the 4-H program to become more accountable and publicly sensitive. There are very few state 4-H staff compared to other states, and roughly one-third of counties do not have full-time county 4-H staff. Because of the fewer number of staff, 4-H must develop new outreach approaches for public contact with both potential and current participants. A more volunteer oriented based with greater reliance on new communication channels must be envisioned and enacted.

In addition to a loss of actual manpower, retirement of faculty also means a loss of institutional memory and unspoken policies. New faculty, unfamiliar with the Extension or 4-H history and philosophy, come with no or different ideas which quickly can become new practice or interpretation of policy. Orientation of county and university and national faculty is needed or unexpected changes can quickly derail good

long term planning efforts.

4-H is no longer the only afterschool youth program for our youth. Afterschool programs are growing dramatically across the state. Along with additional partners, in the field, is a shift in the philosophy of community youth development. Collaboration at the community level for youth development requires a new orientation to many of the present staff and new competencies to facilitate joint programming.

A significant number of youth are becoming home schooled in South Carolina and evidence of their participation has become noticeable in 4-H recognition programs. As this trend continues, 4-H must address new attitudes about education in the state and develop new approaches for attracting equal participation from all educational sectors of society.

Not yet the major minority, but fast becoming one especially in certain areas of the state, Latinos are becoming a new audience with new needs and demands. Sensitivity to their culture and expectations is largely lacking, currently. The need for Spanish curriculum and Spanish speaking staff is growing.

Rising gas prices, recession, and a state shift in economic tax base can jeopardize funding from both governmental as well as private sources. The changes can also influence youth and volunteers' ability to participate in the program.

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

The SC 4-H Program needs an ongoing systematic evaluation of its delivery system and the resultant impacts on youth, families and communities. Toward this goal SC 4H proposes to establish a 4H evaluation committee that will determine types and plans for implementing appropriate evaluations or impact studies over the next five years. The CUMIS system will provide one mechanism for collection of some of the evaluation data.

V(A). Planned Program (Summary)

Program # 7

1. Name of the Planned Program

Environmental Conservation for Wildlife

2. Brief summary about Planned Program

South Carolina has an abundance of wildlife resources that enhance the quality of life, provide families with outdoor recreational opportunities, and drive our economy by providing needed revenue to the state economy and local communities. For example, wildlife and wildlife-related activities contributed more than \$1.5 billion dollars annually to the state's economy. In addition, revenue generated from wildlife recreation (e.g. hunting) in rural communities generates an estimated \$6 million a year to individual counties. Because the Palmetto State is among the fastest growing in the nation, this growth has put unprecedented pressure on wildlife and the habitats that support them. Since most of the land base in the state is privately owned, private landowners have a tremendous opportunity to impact wildlife conservation in South Carolina. This program will explore innovative techniques to deliver educational programs on wildlife conservation and management on private lands, explore and develop synergistic solutions and techniques that overcome wetland and urban wildlife challenges to the benefit of people and wildlife in South Carolina.

Aquatic and terrestrial invasive and nuisance plant and animal species, including several state-listed and federally listed illegal species, are significant in South Carolina. All invasive and nuisance species have adverse economic and environmental effects on production agriculture and natural resource interests with increased dependency on irrigation and environmental effects on fish and wildlife, particularly waterfowl populations. Extension is also charged with training and offering Continuing Certification Units to the 389 (2004) Licensed Aquatic Pesticide Applicators in South Carolina and with educational programs and most up-to date control recommendations to private landowners and managers. Through joint programming between Clemson Extension and SC DNR, the state has twice avoided major infestations of giant salvinia, cited as "the worst weed in the world" and continues work on Phragmites and water hyacinth control.

3. Program existence : Mature (More than five years)

4. Program duration : Long-Term (More than five years)

5. Expending formula funds or state-matching funds : Yes

6. Expending other than formula funds or state-matching funds : No

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
135	Aquatic and Terrestrial Wildlife	100%	100%	100%	100%
	Total	100%	100%	100%	100%

V(C). Planned Program (Situation and Scope)

1. Situation and priorities

Over three fourths of the wildlife habitat in South Carolina is owned by private landowners, primarily forest and farm owners. Consequently there is an information need related to managing wildlife on these lands. We must find ways to create and maintain ecologically significant habitats (including waterways and forests) in and around urban areas as traditional wildlife habitats are lost. Across the country, there is a growing awareness of the need for a proactive management strategy for urban wildlife involving all of the stakeholders. From corridor preservation to city parks and area subdivisions to backyard naturescaping, proactive urban wildlife management is needed to accomplish natural resource conservation objectives successfully. By developing a pool of well-trained volunteers, we can radically increase service hours toward direct enhancement of our natural resources.

Invasive species, both plant and animal, cause significant economic, health and human safety concerns in South Carolina. Unfortunately there is a lack of knowledge of how to effectively address and minimize problems with nuisance species. Aquatic and semi-aquatic wildlife (beaver, muskrat, otter) and select waterfowl (particularly Canada Geese) are a particular concern and can have significant impacts on water quality and consequently human health (E. coli and other bacteria outbreaks from waste).

Human/deer conflicts in South Carolina have increased significantly, causing an estimated \$53 million dollars worth of agricultural damage annually in the state, as well as human health and safety concerns in suburban and urban landscapes. Wildlife and human conflicts are a major issue in South Carolina and will continue to pose significant economic and human health risks as the state becomes more developed. An educated clientele is important in trying to find a balance between sustainable natural resource management and development in the state.

2. Scope of the Program

- In-State Extension

V(D). Planned Program (Assumptions and Goals)

1. Assumptions made for the Program

Educational programs teaching proactive management strategies can be used to successfully conserve natural resources and to minimize problems associated with invasive and nuisance species. In addition, the private sector is providing services for resolving nuisance species problems and these individuals, e.g. Nuisance Wildlife Control Operators, (NWCOS) require training to provide services to reduce conflicts and problems with nuisance species in the most effective, legal and humane manner.

2. Ultimate goal(s) of this Program

This program aims to provide landowners and natural resource managers with the tools, information and economic incentives to maintain and enhance lands for wildlife and to provide services and solutions to mediate and resolve human-wildlife conflicts as they occur.

V(E). Planned Program (Inputs)

1. Estimated Number of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890
2012	4.0	0.0	0.0	0.0
2013	4.0	0.0	0.0	0.0
2014	4.0	0.0	0.0	0.0
2015	4.0	0.0	0.0	0.0
2016	4.0	0.0	0.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

The following activities will be implemented:

1. Develop and deliver educational programs and products on wildlife conservation and management on private lands.
2. Develop web-based educational programs on wildlife conservation and management on private lands.
3. Examine urban wildlife planning issues from the macro level-regions, states, counties, and cities-to the individual site.
4. Educate involved stakeholders of the diverse issues and concerns involved in attracting and/or managing existing urban/suburban wildlife.
5. Encourage civic and community/governmental leaders to plan for urban wildlife "greenspaces" which include waterways and impoundments and educate each about the importance of urban wildlife and its priority on the urban/suburban agenda nationwide.
6. Assist and educate in the development and implementation of urban wildlife plans (i.e. greenspace, waterways and forested sections) and models for area municipalities and developers.
7. Continue to provide training to public and private sector natural resource professionals (NWCs) on best management practices for nuisance wildlife management
8. Conduct Pond Clinics and programs to educate landowners/managers and Aquatic Pesticide Applicators about the most up-to-date control recommendations for aquatic weed management.
9. Furnish up-to-date information to landowners and managers concerning aquatic weed management and control recommendations.
10. Use trained volunteers to promote wildlife management programs among their peers.

2. Type(s) of methods to be used to reach direct and indirect contacts

Extension

Direct Methods	Indirect Methods
<ul style="list-style-type: none"> ● Education Class ● Workshop ● Group Discussion ● One-on-One Intervention ● Demonstrations 	<ul style="list-style-type: none"> ● Public Service Announcement ● Newsletters ● TV Media Programs ● Web sites other than eXtension

3. Description of targeted audience

The target audience includes state, local government and civic leaders, business owners, developers, home and garden clubs, area homeowners, wildlife specialists, state and federal biologists and administrators, potential volunteers, farm and forest owners, landowners/homeowners, Nuisance Wildlife Control Operators, natural resource professionals, Aquatic Pesticide Applicators, general public, farmers, ranchers, poultry and swine producers, foresters, urban, suburban and rural residents, urban planners and managers, concerned citizens, land owners/managers, agency personnel, citizens of South Carolina, Extension agents, youth, municipal officials, and local community groups statewide, children in school, after-school, summer and 4-H, programs, Extension administrators, and support staff.

V(G). Planned Program (Outputs)

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
 - Direct Adult Contacts
 - Indirect Adult Contacts
 - Direct Youth Contacts
 - Indirect Youth Contact
- Number of patents submitted
- Number of peer reviewed publications

Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(H). State Defined Outputs

1. Output Measure

- Number of people completing educational workshops

- Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(I). State Defined Outcome

O. No	Outcome Name
1	Number of people reporting knowledge gained

Outcome # 1

1. Outcome Target

Number of people reporting knowledge gained

2. Outcome Type : Change in Knowledge Outcome Measure

2012:3000 2013:3100 2014:3100 2015:3100 2016:3100

3. Associated Knowledge Area(s)

- 135 - Aquatic and Terrestrial Wildlife

4. Associated Institute Type(s)

- 1862 Extension

V(J). Planned Program (External Factors)

1. External Factors which may affect 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.)

Description

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

V(A). Planned Program (Summary)

Program # 8

1. Name of the Planned Program

Sustainable Forest Management

2. Brief summary about Planned Program

The sustainable forest management program encourages landowners to develop management plans by providing them with alternative silvicultural systems and methods that are suitable for their individual objectives. Alternative systems include uneven-age management, mixed pine/hardwood management and natural regeneration systems. Programs will also educate landowners on forestry Best Management Practices that can be applied to their lands. The program will also present information on urban forest issues and education urban dwellers who may own family forests.

3. Program existence : Mature (More than five years)

4. Program duration : Long-Term (More than five years)

5. Expending formula funds or state-matching funds : Yes

6. Expending other than formula funds or state-matching funds : Yes

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
122	Management and Control of Forest and Range Fires	30%	30%	30%	30%
123	Management and Sustainability of Forest Resources	50%	50%	50%	50%
124	Urban Forestry	20%	20%	20%	20%
	Total	100%	100%	100%	100%

V(C). Planned Program (Situation and Scope)

1. Situation and priorities

Professional foresters are generally biased in favor of clear cutting and intensive management methods. Many landowners fail to manage their forestland because they object to clear cutting or other conventional intensive practices that focus primarily on timber production.

2. Scope of the Program

- In-State Extension
- In-State Research

V(D). Planned Program (Assumptions and Goals)

1. Assumptions made for the Program

Teaching forestry best management practices can improve forest productivity and promote natural resource conservation.

2. Ultimate goal(s) of this Program

The goal of this program is to promote sustainable management of forest resources and understanding of natural forest systems through: 1) proactive leadership, (2) continuing education, and (3) educational training on public issues affecting forestry.

V(E). Planned Program (Inputs)

1. Estimated Number of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890
2012	3.0	1.0	1.5	0.0
2013	3.0	1.0	1.8	0.0
2014	3.0	1.0	0.0	0.0
2015	3.0	0.0	0.0	0.0
2016	1.0	0.0	0.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

The following activities will be conducted:

1. Develop and conduct training programs to teach sustainable forestry principles
2. Utilize and expand demonstrations of longleaf pine restoration, even and uneven-age management, pine straw production, and alternative management systems throughout the state.
3. Provide natural resource professionals with programming on longleaf pine ecology, management technology, and hardwood management.
4. Write and produce news articles and radio programs and other forms of mass media on longleaf pine management and ecology.
5. Inform landowners of the economic and environmental benefits of using BMPs in all forest management operations.
6. Work with established groups within the forestry community to support and promote appropriate training and outreach programs related to sustainable forest management.
7. Use trained master landowners to promote forest management among their peers.
8. Utilize and expand existing demonstrations of hardwood (bottomland and upland) management to provide an understanding of even age and uneven age management systems.
- 9 Utilize the TOP Logger and other logger education programs to train loggers on sustainable forestry and alternative silvicultural systems.
10. Promote the use of prescribed fire.
11. Educate public officials and urban communities about the benefits of urban forests.
12. Develop methods of control and educate professionals and family forest landowners on these to

eliminate or control invasive pests of forests and enhance forest health.

2. Type(s) of methods to be used to reach direct and indirect contacts

Extension

Direct Methods	Indirect Methods
<ul style="list-style-type: none"> ● Education Class ● Workshop ● Group Discussion ● One-on-One Intervention 	<ul style="list-style-type: none"> ● Public Service Announcement ● Newsletters ● TV Media Programs ● Web sites other than eXtension

3. Description of targeted audience

The target audience will include private landowners, loggers, professional resource managers, foresters and other natural resource professionals, road building and site preparation contractors, family forest landowners, consulting foresters that assist private landowners, and the general public.

V(G). Planned Program (Outputs)

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
 - Direct Adult Contacts
 - Indirect Adult Contacts
 - Direct Youth Contacts
 - Indirect Youth Contact
- Number of patents submitted
- Number of peer reviewed publications

Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(H). State Defined Outputs

1. Output Measure

- Number of people completing educational workshops
 - Disclosures
 - New Products, Processes, Procedures and Policies
 - Percent increase of outside funds for grants, contracts and gifts
- Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(I). State Defined Outcome

O. No	Outcome Name
1	Number of people reporting increased knowledge

Outcome # 1

1. Outcome Target

Number of people reporting increased knowledge

2. Outcome Type : Change in Knowledge Outcome Measure

2012:100

2013:100

2014:100

2015:100

2016:100

3. Associated Knowledge Area(s)

- 122 - Management and Control of Forest and Range Fires
- 123 - Management and Sustainability of Forest Resources

4. Associated Institute Type(s)

- 1862 Extension

V(J). Planned Program (External Factors)

1. External Factors which may affect 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.)

Description

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

Overall BMP compliance level as determined by the SC Forestry Commission monitoring

V(A). Planned Program (Summary)

Program # 9

1. Name of the Planned Program

Childhood Obesity

2. Brief summary about Planned Program

The prevalence of overweight and obesity has become one of the most critical health issues in both South Carolina and the United States. Overweightness and obesity cut across all ages, economic levels, and racial and ethnic groups. In South Carolina, over sixty percent of all adults are now either overweight or obese. South Carolina is the 5th fattest state in the nation. According to the American Public Health Association, Partnership for Prevention and United Health Foundation's comprehensive national review of the nation's health, South Carolina ranks 48th among the states and is one of the least healthy .

Research is being initiated to identify ways to increase knowledge of health, nutrition and healthy lifestyles. The researchers will examine ways to change the attitude about eating healthy foods and daily exercise, while reducing the number of overweight and obese participants. Researchers will also examine an integrated approach to prevention of obesity in high risk families.

Children learn eating behaviors from adults and peers. There are relatively few studies examining the role of the family in shaping and supporting behaviors leading to weight gain, loss or maintenance. This program intends to present an approach to integrate research, teaching and outreach to address the multifaceted public health problem. Nutrition education programs will focus on the topic of preventing childhood obesity.

3. Program existence : New (One year or less)

4. Program duration : Medium Term (One to five years)

5. Expending formula funds or state-matching funds :Yes

6. Expending other than formula funds or state-matching funds : No

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
502	New and Improved Food Products	0%	0%	20%	0%
701	Nutrient Composition of Food	0%	10%	20%	10%
702	Requirements and Function of Nutrients and Other Food Components	0%	10%	45%	10%
703	Nutrition Education and Behavior	50%	30%	5%	40%
723	Hazards to Human Health and Safety	5%	30%	5%	10%
724	Healthy Lifestyle	45%	20%	5%	30%
	Total	100%	100%	100%	100%

V(C). Planned Program (Situation and Scope)**1. Situation and priorities**

South Carolina's obesity rates have doubled, since 1985. Over 60% of adults are now either overweight or obese. Obesity rates are increasing in children, with an estimated 34% of all school-aged children and 25 % of low income children being obese. Prevention of the development of obesity is essential and prevention should start with children. Children have the lowest prevalence of obesity, but the habits that lead to obesity are developed early in life.

2. Scope of the Program

- In-State Extension
- In-State Research

V(D). Planned Program (Assumptions and Goals)**1. Assumptions made for the Program**

A critical step in developing successful interventions to increase physical activity and healthy eating for the prevention and control of obesity among children involves understanding how families influence the weight-regulating behaviors of their children.

2. Ultimate goal(s) of this Program

A goal of this program is to determine the efficacy and cost-effectiveness of the proposed interventions through randomized trials, enable continued refining of our understanding of relationships, and develop empirical evidence for improving and adapting interventions to family environmental contexts. Thus, increasing the probability of success of future obesity prevention and control interventions with children.

There will be four primary objectives for research in childhood obesity:

1. Explore associations between family domain factors and child physical activity and eating

behaviors.

2. Develop and refine measures of family domain factors associated with child physical activity and eating behaviors.
3. Delineate the strength and direction (causal linkages) of the relationships between family domain factors with the greatest potential for change through community based interventions.
4. Pilot test an intervention targeted towards family factors that relate child physical activity and eating behaviors.

In addition, the aim is to reduce the prevalence of overweightness, obesity and the associated health risks and promote healthy lifestyles of children in South Carolina. A multi-faceted approach will be used, focusing on the development and promotion of lifelong healthy eating and physical activity behaviors for children, youth, and families and on working with partners to change the nutrition and fitness environment.

V(E). Planned Program (Inputs)

1. Estimated Number of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890
2012	12.0	3.0	0.3	2.0
2013	12.0	3.0	0.3	2.0
2014	12.0	3.0	0.3	2.0
2015	12.0	3.0	0.3	2.0
2016	12.0	3.0	0.3	2.0

V(F). Planned Program (Activity)

1. Activity for the Program

Associations will be explored between family domain factors and child physical activity and eating behaviors. Measures of family domain factors associated with child physical activity and eating behaviors will be developed and refined. This program will delineate the strength and direction of the relationships between family domain factors with the greatest potential for change through community based interventions. A pilot test will be conducted of an intervention targeted towards family factors that mediate child physical activity and eating behaviors.

Educational workshops will be conducted with youth and families of general and limited resources to improve their health and well-being. Health assessments on participants and their families will be conducted. Daily recreational activities will be incorporated into the summer and after-school programs.

2. Type(s) of methods to be used to reach direct and indirect contacts

Extension

Direct Methods	Indirect Methods
<ul style="list-style-type: none"> ● Education Class ● Workshop ● Group Discussion ● One-on-One Intervention ● Demonstrations 	<ul style="list-style-type: none"> ● Public Service Announcement ● Billboards ● Newsletters ● TV Media Programs ● Web sites other than eXtension

3. Description of targeted audience

The target audience includes agencies that serve all income levels, including limited resource families and youth.

V(G). Planned Program (Outputs)

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
 - Direct Adult Contacts
 - Indirect Adult Contacts
 - Direct Youth Contacts
 - Indirect Youth Contact
- Number of patents submitted
- Number of peer reviewed publications

Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(H). State Defined Outputs

1. Output Measure

- National Media Placements
- Number of people completing educational workshops

Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(I). State Defined Outcome

O. No	Outcome Name
1	Number of people gaining knowledge as a result of participating in educational workshops

Outcome # 1

1. Outcome Target

Number of people gaining knowledge as a result of participating in educational workshops

2. Outcome Type : Change in Knowledge Outcome Measure

2012:3050 2013:3050 2014:3050 2015:3050 2016:3050

3. Associated Knowledge Area(s)

- 703 - Nutrition Education and Behavior
- 724 - Healthy Lifestyle

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension
- 1890 Research

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

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

Description

{NO DATA ENTERED}

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

{NO DATA ENTERED}

V(A). Planned Program (Summary)

Program # 10

1. Name of the Planned Program

Climate Change

2. Brief summary about Planned Program

The planned program in climate change will initially be focused on determining how natural organic matter in coastal environments is impacted by climate changes and the impact of climate changes on coastal marine communities. Research with remote sensing technology in select South Carolina rivers will provide valuable data for gauging the impact of climate change. The research will also address real-time GIS/hydrology flood warning system for first responders in rural areas. This technology will also be applied in the water quality program.

Climate change and global warming will affect food supply. South Carolina is the No. 2 peach-producer in the nation and growers are concerned. Many fruit and nut trees need sufficient chilling hours to make fruit. The trees, also, need to be hardy enough to withstand a late frost. In response to climate change, work is being directed towards improving the economic and environmental sustainability in tree fruit production through changes in rootstock use. The genetic and cellular signals that begin dormancy and the developmental events involved in bud formation and non-growth seasonal phases are being examined. This research is also an integral component of the sustainable agriculture production for horticultural crops.

3. Program existence : Intermediate (One to five years)

4. Program duration : Medium Term (One to five years)

5. Expending formula funds or state-matching funds : Yes

6. Expending other than formula funds or state-matching funds : No

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
101	Appraisal of Soil Resources	0%	0%	40%	0%
132	Weather and Climate	0%	0%	20%	100%
135	Aquatic and Terrestrial Wildlife	0%	0%	40%	0%
	Total	0%	0%	100%	100%

V(C). Planned Program (Situation and Scope)

1. Situation and priorities

The Southeastern states will begin to experience the effects on climate change in their coastal regions, sea level rise, for example, increasing water salinity inland and converting freshwater wetlands into salt marsh.

Also, increases in temperature and frequent rainstorms and hurricanes, due to climate changes, will alter biogeochemical processes in soils. Natural communities of species in coastal regions will also be impacted by climate change.

Priorities will include determining the sources and inputs of halogenated organics to SC coastal ecosystems and identifying "hotspots" and major mechanisms of greenhouse gas and pollutants.

It will also be important to determine if natural communities of species are bound together by strong ecological interactions or if species respond individually to changes in the environment.

The research seeks to integrate readily available hydrology analysis systems with accumulated, in-situ and real-time remotely sensed precipitation data to predict the likelihood that roads, bridges, underpasses, etc. in rural areas are flooded during severe rain events. The U. S. Weather Service NEXRad integrated precipitation products as an input to a GIS compatible hydrology model will be used.

2. Scope of the Program

- In-State Research

V(D). Planned Program (Assumptions and Goals)

1. Assumptions made for the Program

There is now a consensus that global temperatures will likely change more in the next century than they have typically changed over recent geologic history.

Agencies in the Southeastern US need to understand the effects of population growth and climate change on greenhouse gas emissions, carbon cycling and natural communities of species in coastal regions.

The research project will safely and quickly get first responders to an emergency.

2. Ultimate goal(s) of this Program

The goals of this program include:

To provide research based information to federal, state and local agencies about the impacts of sea level rise on biogeochemical processes and the challenges of balancing population growth with water resource needs and environmental quality goals.

To develop an understanding of the latitudinal responses of interacting species in coastal regions to climate change.

V(E). Planned Program (Inputs)

1. Estimated Number of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890
2012	0.0	0.0	0.6	0.0
2013	0.0	0.0	0.6	0.0
2014	0.0	0.0	0.6	0.0
2015	0.0	0.0	0.6	0.0
2016	0.0	0.0	0.6	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

Controlled laboratory studies will make it possible to identify the controlling factors in greenhouse gas emissions and pollutants production in different environmental settings. Gas, soil and water samples will be collected for greenhouse gas, natural organic matter and hyocabon analysis.

A multi-species phylogeographic survey of wide taxonomic breadth, will be conducted, highlighting species whose contemporary ecological interactions have been extensively characterized.

A web-based GIS floodwarning system is expected to be developed. Collecting data of selected flood areas. Articles and presentations are planned.

2. Type(s) of methods to be used to reach direct and indirect contacts

Extension	
Direct Methods	Indirect Methods

<ul style="list-style-type: none">● Education Class● Group Discussion● One-on-One Intervention	<ul style="list-style-type: none">● Public Service Announcement● Web sites other than eXtension
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3. Description of targeted audience

The target audience will include regulatory agencies, resource managers, local county and municipal officials and public works staff.

V(G). Planned Program (Outputs)

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
 - Direct Adult Contacts
 - Indirect Adult Contacts
 - Direct Youth Contacts
 - Indirect Youth Contact
- Number of patents submitted
- Number of peer reviewed publications

Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(H). State Defined Outputs

1. Output Measure

- Disclosures
- Licenses

Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(I). State Defined Outcome

O. No	Outcome Name
1	Provide knowledge to policy makers to assist in coping with the effects of climate change, particularly in the coastal region.

Outcome # 1

1. Outcome Target

Provide knowledge to policy makers to assist in coping with the effects of climate change, particularly in the coastal region.

2. Outcome Type : Change in Knowledge Outcome Measure

2012:3	2013:2	2014:3	2015:3	2016:0
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3. Associated Knowledge Area(s)

- 132 - Weather and Climate
- 135 - Aquatic and Terrestrial Wildlife

4. Associated Institute Type(s)

- 1862 Research
- 1890 Research

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

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

Description

{NO DATA ENTERED}

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

{NO DATA ENTERED}

V(A). Planned Program (Summary)

Program # 11

1. Name of the Planned Program

Sustainable Energy

2. Brief summary about Planned Program

Researchers are analyzing over 400 varieties of sorghum grown in South Carolina, seeking the ones most easily converted into fuel. They are also using genetics and bioinformatics to find sorghum genes that maximize sugar release from the whole plant (not just grain and juice) enabling sorghum plant breeders to naturally engineer next-generation bioenergy feedstock to improve the crop-to-fuel conversion process. In addition, discoveries of genetic control in sorghum, such as drought tolerance, pest resistance and improved yields, will aid producers of related crops, including corn, rice and turfgrass.

Processed switchgrass - a biofuel easily grown in South Carolina - is being tested to make bioethanol. The research team focuses on freeing the plant sugars from cellulose, which plants use for cell walls. Champagne yeast, which is more active than other yeasts, and an enzyme is mixed with the glucose and xylose - the two most prevalent plant sugars - to brew bioethanol. Switchgrass is classified as a second-generation biofuel - a non-food crop used to make ethanol. Educational programs will be conducted to teach farmers how to grow crops for bio-fuels.

3. Program existence : Intermediate (One to five years)

4. Program duration : Long-Term (More than five years)

5. Expending formula funds or state-matching funds : Yes

6. Expending other than formula funds or state-matching funds : No

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
101	Appraisal of Soil Resources	0%	0%	40%	0%
201	Plant Genome, Genetics, and Genetic Mechanisms	10%	0%	20%	0%
402	Engineering Systems and Equipment	0%	0%	10%	0%
511	New and Improved Non-Food Products and Processes	90%	0%	30%	0%
	Total	100%	0%	100%	0%

V(C). Planned Program (Situation and Scope)

1. Situation and priorities

Alternative sources for the production of biofuels is a national priority. In South Carolina crops that could serve as a source for biofuel could mean new crops and income for South Carolina farmers. Priorities include identifying alternative sources, optimizing the state's ability to successfully produce the crops and expanding the science and engineering for biobased industries and an economy with a biobased component.

2. Scope of the Program

- In-State Extension
- In-State Research
- Multistate Research

V(D). Planned Program (Assumptions and Goals)

1. Assumptions made for the Program

New sources for biofuels will provide income for South Carolina farmers, and help to lessen the state and national dependence on oil and oil based products, particularly for energy. Forestry and crops for bioenergy production can contribute to the goal of energy independence for the country.

2. Ultimate goal(s) of this Program

The goal of the program is to identify new options for producing cost effective options to petroleum based fuels and to teach farmers to grow and market these sources.

V(E). Planned Program (Inputs)

1. Estimated Number of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890
2012	2.0	0.0	2.1	0.0
2013	2.0	0.0	2.1	0.0
2014	2.0	0.0	2.1	0.0
2015	2.0	0.0	2.1	0.0
2016	2.0	0.0	2.1	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

The following activities will be implemented:

1. Introduce sorghum feedstock as a source of material for the SC biofuel industry.
2. Identify ways to optimize switchgrass growth in the Southeastern coastal plain.
3. Identify ways to enhance the conversion of switchgrass to biofuels using cellulose systems in microbes.

4. Develop and conduct workshops to teach sustainable forestry principles.
5. Produce media programs on forest management.
6. Inform landowners of the economic and environmental benefits of using BMPs in all forest management operations.
7. Work with established groups within the forestry community to support and promote appropriate training and outreach programs related to sustainable forest management.
8. Utilize the TOP Logger and other logger education programs to train loggers on sustainable forestry and alternative silvicultural systems.

2. Type(s) of methods to be used to reach direct and indirect contacts

Extension

Direct Methods	Indirect Methods
<ul style="list-style-type: none"> ● Education Class ● Workshop ● Group Discussion ● One-on-One Intervention ● Demonstrations 	<ul style="list-style-type: none"> ● Public Service Announcement ● Billboards ● Newsletters ● TV Media Programs ● Web sites other than eXtension

3. Description of targeted audience

All consumers in the state will benefit from research and education programs related to lower cost energy options.

V(G). Planned Program (Outputs)

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
 - Direct Adult Contacts
 - Indirect Adult Contacts
 - Direct Youth Contacts
 - Indirect Youth Contact
- Number of patents submitted
- Number of peer reviewed publications

Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(H). State Defined Outputs

1. Output Measure

- Disclosures
 - License agreements
 - Number of people completing educational workshops.
- Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(I). State Defined Outcome

O. No	Outcome Name
1	Number of people participating gaining knowledge as a result of participating in educational workshops

Outcome # 1

1. Outcome Target

Number of people participating gaining knowledge as a result of participating in educational workshops

2. Outcome Type : Change in Knowledge Outcome Measure

2012:2000

2013:2000

2014:2000

2015:2000

2016:2000

3. Associated Knowledge Area(s)

- 511 - New and Improved Non-Food Products and Processes

4. Associated Institute Type(s)

- 1862 Extension

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

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

Description

{NO DATA ENTERED}

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

{NO DATA ENTERED}

V(A). Planned Program (Summary)

Program # 12

1. Name of the Planned Program

Global Food Security and Hunger

2. Brief summary about Planned Program

Extension will conduct educational programs to develop and implement agricultural production systems that are economically sustainable and environmentally sound. Objectives include improving profitability and reducing negative environmental impacts of horticultural cropping systems, increasing efficiency of production, and increasing the supply and dissemination of information and knowledge about integrated pest management strategies and systems that are available to growers. Educational programs and field trials will be conducted and sound agriculture practices and policies will be promoted.

The program of research will have a focus on improving the quality and nutritional value of various foods, improving production techniques and managing pests and disease. All of these will increase global food security and make more food available in developing countries who are able to utilize the knowledge developed. The program for global food security and hunger will range from enhancing the fatty acid composition of ruminant animal products to determining the genetic bases for resistance and immunity to avian diseases on the animal side to irrigation management for humid and sub-humid areas and integrated management strategies for honey bee pests and diseases.

Another research element of the program for improving productivity and profitability of the SC peach industry includes developing and improving pome and stonefruit rootstocks through breeding and genetic engineering, focused on resistant gene candidates. The eradication, containment and/or management of Plum Pox disease and other viruses in peaches is another major component of the program, as is acquiring new rootstocks from worldwide sources. Providing expertise in the diagnosis of viral diseases and formulating methods for the control of viral diseases, nepoviruses and other viruses associated with virus like symptoms seen in SC melons, and watermelon mosaics virus and other viruses found in cucurbits. A third research element of the program will facilitate the development of virus control programs by identifying the pathogens associated with the disease, determining epidemiological properties, developing strategies and assist in their implementation. The research program will have several other activities underway paralleling the three elements focusing on improving productivity and profitability. These include rapid screening of pesticide residues in fruits, biological control of soil-borne plant pathogens and characterizing causal agents associated with graft-transmissible diseases of unknown etiology to facilitate the development of rapid diagnostics and appropriate control measures.

Food security and hunger are issues that are found at the state and national levels as well as globally. Research in South Carolina to develop methodologies and processes to enhance food security in the state will be applicable in most parts of the world where food security is an issue. South Carolina's work to develop new varieties and new production techniques can have a direct application to increasing food production in developing countries. Work on animal disease, irrigation, pest management, honeybees and managing plant-parasitic nematodes in sustainable agroecosystems can all contribute to the management of world hunger.

Priorities include methodologies to increase food security and the development of new varieties and production techniques to increase yields in plant and animal food production.

An intensive, high-input agricultural production system has put stress on the environment and on our rural communities. Intensive agricultural production has contributed to depletion of soil resources and

contamination of groundwater. It has also increased the cost of production, putting economic stress on farm families and rural communities. In response to problems there has been an increasing emphasis on development of sustainable agricultural production systems. Integrated Crop Management (ICM) is an approach to farming which aims to balance production with sound economic and environmental strategies, such as crop rotation, cultivations techniques, appropriate crop varieties and careful use of inputs.

3. Program existence : Intermediate (One to five years)

4. Program duration : Long-Term (More than five years)

5. Expending formula funds or state-matching funds : Yes

6. Expending other than formula funds or state-matching funds : No

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants	0%	10%	10%	0%
204	Plant Product Quality and Utility (Preharvest)	25%	25%	10%	0%
205	Plant Management Systems	25%	25%	5%	0%
212	Pathogens and Nematodes Affecting Plants	25%	0%	10%	0%
213	Weeds Affecting Plants	10%	0%	0%	0%
216	Integrated Pest Management Systems	5%	0%	0%	0%
301	Reproductive Performance of Animals	0%	10%	10%	0%
302	Nutrient Utilization in Animals	0%	0%	5%	0%
303	Genetic Improvement of Animals	0%	5%	10%	0%
304	Animal Genome	0%	0%	10%	0%
305	Animal Physiological Processes	0%	0%	5%	0%
307	Animal Management Systems	0%	0%	10%	0%
311	Animal Diseases	0%	0%	10%	0%
601	Economics of Agricultural Production and Farm Management	5%	25%	0%	0%
604	Marketing and Distribution Practices	5%	0%	0%	0%
701	Nutrient Composition of Food	0%	0%	5%	0%
	Total	100%	100%	100%	0%

V(C). Planned Program (Situation and Scope)

1. Situation and priorities

Agricultural firms today are forced to consider greater market, financial, production, and environmental risks than in the past, which require a significant change in agribusiness management philosophy. In addition, US agriculture is a \$1 trillion-per-year industry, responsible for 1/6 of the gross national production. Reducing South Carolina's vulnerability to terrorism and responding rapidly to suspected activity is more important now than ever. As South Carolina faces major concerns of emerging disease outbreaks, invasive plant species introduction, exotic plant pest and disease introduction, food safety, and other agroterrorism issues, the roles of state/county emergency officers and first responders are rapidly expanding.

Research is being focused on field crops which have experienced substantial production increases in the state to include, wheat, cotton, peanuts and soybeans. The program seeks to develop high yielding high test weight wheat populations with improved disease resistance and insect resistance levels that could lead to the release of wheat varieties or germplasm adapted to the Southeastern US; compare the performance of newer cotton cultivars to older established cultivars and assessing the differences in yield, maturity and fiber quality among newly developed transgenic siblings and their recurrent parents; improve the economic and environmental sustainability of peanut crop management systems; identifying novel gene targets for improvement of stress responses in soybeans; determine the effects of narrow vs. wide row soybean production systems on yield losses due to Columbia lance and soybean cyst nematodes, and develop damage thresholds; develop high yielding soybean cultivars, both conventional and glyphosate tolerant, adapted to SC and other areas of the Southeast, and cultivars and/or germplasm with resistance/tolerance to Soybean Cyst and the Columbia Lance Nematodes. Identifying superior soybean competitive cultivars and associated morphological and phenological characteristics for wide and narrow row soybeans.

Extension will conduct educational programs to develop and implement agricultural production systems that are economically sustainable and environmentally sound. In addition, changes in government regulations and the economic environment have increased the risk of farming in South Carolina. Both large scale and small and limited resource firms are forced to consider greater market, financial, production, and environmental risks than in the past. The risks will require a significant change in agribusiness management philosophy and also provide a challenge to develop risk-oriented educational programs. Crops such as wheat, cotton peanuts and soybeans have experienced substantial production increases in South Carolina.

2. Scope of the Program

- In-State Extension
- In-State Research
- Multistate Research

V(D). Planned Program (Assumptions and Goals)

1. Assumptions made for the Program

Educational programs can provide growers with information so that they can make informed decisions to improve profitability and reduce the negative environmental impacts of horticultural cropping systems. In addition, it is assumed that there is market demand for forage-fed beef, improved nutritional value in milk, and that producers need every advantage and the latest knowledge to remain competitive in their businesses. It is also assumed that disease resistance in poultry flocks is an area of critical importance and of great interest to the poultry industry in South Carolina and in neighboring states. Educational programs can teach producers best management practices that lead to production and economic efficiency.

Research in plants and animals which leads to increased health and yields can be applied to a variety of different geographic locations. Irrigation management for humid and sub-humid areas in South Carolina will be valid in different parts of the world with similar climatic conditions.

2. Ultimate goal(s) of this Program

Educational programs will provide growers with information so that they can make informed decisions to improve profitability and reduce the negative environmental impacts of agronomic and horticultural cropping systems, to increase efficiency of production, and increase the supply and dissemination of information and knowledge about IPM strategies and systems that are available to growers. The goal is to reduce costs, negative environmental impacts, and increase profitability for producers. In addition, the program will encourage growers to adopt new horticultural production practices.

The program will encourage growers to adopt new agronomic and horticultural production practices. The program will help to simplify farm record keeping, which encourages participants to maintain farm records on a continuous basis and improve financial management; educate farmers on ways to implement production systems that require the application of low off-farm input and provide opportunities for farmers to grow crops that satisfy consumer demand within environmentally safe conditions. The program will support the development of niche markets for beef, dairy and poultry producers, allow farmers in the state to diversify their operations and make local products available to the citizens of the state, develop and implement animal production systems that are economically sustainable and environmentally sound, and provide training that will increase herd management skills and assist producers in making informed business decisions.

There will be a focus on the development of new processes to enhance food security on the local, state, national and global levels. A combination of new varieties, new methodologies for plant and animal management, refined integrated pest management approaches and new innovations through genomics will assist in dealing with world hunger issues.

V(E). Planned Program (Inputs)

1. Estimated Number of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890
2012	30.0	3.0	12.9	0.0
2013	30.0	3.0	12.9	0.0
2014	30.0	3.0	12.9	0.0

Year	Extension		Research	
	1862	1890	1862	1890
2015	30.0	3.0	12.9	0.0
2016	30.0	0.0	12.9	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

Educational workshops will be conducted focused on programs and activities related to integrated crop management, integrated pest management, water resources, risk management, and marketing. Field trials will be conducted and sound agriculture practices and policies will be promoted.

Research will be conducted to improve global capacity to meet growing food demand, address problems related to childhood obesity, maintain high agricultural productivity in the face of climate change, and focus on the development of biomass for sustainable energy.

Stink bugs, feed on some of the region's most important crops, including cotton, corn, peanuts, soybeans, tobacco and wheat. Clemson researchers are working to develop methods to control the pests, particularly in cotton. The work will also help to elucidate the ecology and spatial dynamics of stink bugs and their natural enemies. Stink bugs were once considered secondary pests in the United States, but Stink bugs are going to be or already are the No. 1 insect pest of cotton in the Southeast.

Cotton crop losses caused by stink bug damage were estimated at \$60 million in 2002, with losses of more than 151,000 cotton bales in 2006. Research could lead to substantial reductions of insecticides and a more targeted approach for control of stink bugs in cotton.

Researchers are developing and testing technologies for site-specific detection and control of plant-parasitic nematodes either to lower the use of high-risk pesticides, such as carbamates and soil fumigants, or to optimize nematicide utilization in cotton production in the southern U.S. Every year, about 10 percent of U.S. cotton production is lost to nematodes. Yield losses in individual fields may reach 50 percent.

2. Type(s) of methods to be used to reach direct and indirect contacts

Extension

Direct Methods	Indirect Methods
<ul style="list-style-type: none"> ● Education Class ● Workshop ● Group Discussion ● One-on-One Intervention ● Demonstrations 	<ul style="list-style-type: none"> ● Public Service Announcement ● Billboards ● Newsletters ● TV Media Programs ● Web sites other than eXtension

3. Description of targeted audience

Research in this program has the potential to benefit growers, state, federal and international agencies dealing with food production and distribution and with end users in countries around the world.

The target audience includes producers, Limited-Resource Farmers and Extension personnel, agency personnel.

V(G). Planned Program (Outputs)

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
 - Direct Adult Contacts
 - Indirect Adult Contacts
 - Direct Youth Contacts
 - Indirect Youth Contact
- Number of patents submitted
- Number of peer reviewed publications

Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(H). State Defined Outputs

1. Output Measure

- Disclosures
- Licenses
- Number of people completing educational workshops
- New Variety Releases

Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(I). State Defined Outcome

O. No	Outcome Name
1	Number of people reporting increased knowledge
2	Number of publications authored or co-authored (fact sheets, papers presented at national meetings, etc.)
3	Number of acres affected by Integrated Crop Management and Integrated Pest Management programs.

Outcome # 1

1. Outcome Target

Number of people reporting increased knowledge

2. Outcome Type : Change in Knowledge Outcome Measure

2012:13000 2013:13500 2014:14000 2015:14500 2016:14500

3. Associated Knowledge Area(s)

- 205 - Plant Management Systems
- 212 - Pathogens and Nematodes Affecting Plants
- 213 - Weeds Affecting Plants
- 302 - Nutrient Utilization in Animals
- 303 - Genetic Improvement of Animals
- 307 - Animal Management Systems
- 311 - Animal Diseases
- 601 - Economics of Agricultural Production and Farm Management

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

Outcome # 2

1. Outcome Target

Number of publications authored or co-authored (fact sheets, papers presented at national meetings, etc.)

2. Outcome Type : Change in Knowledge Outcome Measure

2012:2 2013:2 2014:2 2015:2 2016:2

3. Associated Knowledge Area(s)

- 302 - Nutrient Utilization in Animals
- 303 - Genetic Improvement of Animals
- 307 - Animal Management Systems
- 601 - Economics of Agricultural Production and Farm Management

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 3

1. Outcome Target

Number of acres affected by Integrated Crop Management and Integrated Pest Management programs.

2. Outcome Type : Change in Action Outcome Measure

2012:30200 2013:40200 2014:45200 2015:50200 2016:50200

3. Associated Knowledge Area(s)

- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 212 - Pathogens and Nematodes Affecting Plants
- 213 - Weeds Affecting Plants
- 601 - Economics of Agricultural Production and Farm Management

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

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

Description

{NO DATA ENTERED}

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

{NO DATA ENTERED}