

Joint Plan of Work for Research and Extension at Clemson University and South Carolina State University

Annual Update
Submitted June 27, 2003

TABLE OF CONTENTS

Purpose and Introduction	2
Certification	3
Plan of Work Narrative	4
A. General	4
B. Components of the Plan of Work	5
1. Planned Programs	5
a. Goal 1 An Agricultural System that is Highly Competitive in the Global Economy	6
b. Goal 2 A Safe and Secure Food System	42
c. Goal 3 A Healthy Well Nourished Population	51
d. Goal 4 Greater Harmony between Agriculture and the Environment	56
e. Goal 5 Enhanced Economic Opportunity and Quality of Life for Americans	66
B. Components of the Plan of Work (Continued)	
2. Stakeholder Input Process	86
3. Program Review Process	90
4. Multi-State Research and Extension Initiatives	97
5. Integrated Research and Extension Activities	101

Joint Plan of Work for Research and Extension at Clemson University and South Carolina State University

Annual Update **Submitted June 27, 2003**

Purpose of the Annual Update:

This annual update is being submitted to reflect changes in the Joint Plan of Work for Research and Extension in South Carolina. Both South Carolina State University and Clemson University experienced a series of state budget reductions during the period July 1, 2002 to June 30, 2003 and a significant budget reduction for the period July 1, 2003 to June 30, 2004. In response, South Carolina State instituted mandatory furloughs to compensate for the short fall of state funding for research and Extension activities. Clemson University instituted two incentive programs to encourage faculty and staff to retire and used the savings generated to offset the loss of state research and Extension funding. This modification reflects changes in levels of research and Extension activities in the five goals by key themes at Clemson which were made in response to the retirement of key faculty and staff. The furlough strategy by South Carolina State did not impact planned activities for the last year of this five year plan of work, and the elements of their plan for FFY 2003 were unchanged.

In addition, the narrative describing integrated research and Extension activities at Clemson was supplemented with additional detail, and the composition and operating strategy for the Merit Review Committee was modified to reflect the efforts to reduce costs related to the merit review process while maintaining a high quality of stakeholder input into the review of programs.

Introduction:

South Carolina State University's 1890 Research and Cooperative Extension Service organizations are based in Orangeburg, South Carolina. South Carolina State has a presence in sixteen counties. There are three counties with offices (Orangeburg, Marlboro and Hampton). The three county offices each serve a cluster area. The Orangeburg Cluster consists of Bamberg, Calhoun, Dorchester and Orangeburg Counties. The Marlboro Cluster serves Dillon, Florence, Marion and Marlboro Counties. The Hampton Cluster includes Allendale, Beaufort, Colleton, Hampton and Jasper Counties. Furthermore, South Carolina State 1890 Cooperative Extension shares office space with Clemson in three counties (Anderson, Greenwood and Williamsburg Counties). There is only one agricultural agent in Anderson and Greenwood Counties each. Williamsburg County has the presence of one youth agent. The other cluster areas are housed with a full-time staff. There are no research offices located off the premises of the South Carolina State University campus.

Clemson University's Experiment Station and the Cooperative Extension Service are based at Clemson South Carolina. Five Research and Education Centers are strategically located across South Carolina along with three youth leadership centers. Cooperative Extension offices are located in each county. Research faculty and facilities and Extension specialists are also located on the main campus in Clemson.

The plan of work is a comprehensive statement of the planned research and extension program initiatives at Clemson University and South Carolina State University for the period 2003-2004, as required by the Agricultural Research, Extension and Education Reform Act of 1998 (AREERA), and as allowed under

the USDA's Guidelines for Land Grant Institution Plan of Work. The plan is based in current strategic plans.

The following table presents the national goals for which programs in research and extension at Clemson University and South Carolina State University are planned and conducted.

	Goal 1	Goal 2	Goal 3	Goal 4	Goal 5
1862 CES	X	X	X	X	X
1862 ES	X	X		X	
1890 CES	X	X	X	X	X
1890 AES	X	X			X

CERTIFICATION:

This Joint Plan of Work for the period October 1, 2003 to September 30, 2004 for Research and Extension in South Carolina is respectfully submitted as updated effective July 1, 2003 by:

John W. Kelly, Ph.D. Director Experiment Station Clemson University _____ Date: _____	John W. Kelly, Ph.D. Director Cooperative Extension Service Clemson University _____ Date: _____	Dr. James H. Walker, Jr. Executive Director 1890 Research and Extension South Carolina State University _____ Date: _____
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PLAN OF WORK NARRATIVE FOR

RESEARCH AND EXTENSION IN SOUTH CAROLINA

I. Preface and Authority

Federal Register Vol. 64, No. 74/Monday, April 19, 1999/Notices

II. Annual update of the 5 year plan of work for Research and Extension in South Carolina

A. General

1. Planning Option

The plan of work is a 5 year prospective plan that covers the period of fiscal year 2000 through 2004, with the option to submit annual updates to the 5 year plan of work. The 5 year plan of work may be prepared for an institution's individual functions.

2. Period Covered

The five year plan of work should cover the period from October 1, 1999 through September 30, 2004.

3. Projected Resources

The resources that are allocated for various planned programs in the five year plan of work, in terms of human and fiscal measures, should be included and projected over the next five years.

4. Submission and Due Date

The 5 year plan of work must be submitted by July 15, 1999 to the Partnerships unit of the Cooperative State Research, Education and Extension Service, U. S. Department of Agriculture.
(Bhewitt@reeusda.gov)

5. Certification

The 5 year plan of work has been signed by the 1862 Research and Extension Director and the 1890 Research and Extension Executive Director see page 3.

6. Definitions See Federal Register, Vol. 64, No. 74, Monday April 19, 1999, pp 19245-19246.

B. Components of the Five Year Plan of Work

1. Planned Programs

a. National Goals: The five year plan of work for research and extension at South Carolina State University and Clemson University is based on the five national goals established in the Cooperative State Research Education and Extension Service (CSREES) Agency Strategic Plans and aligned to the five national goals within the Research, Education and Economics (REE) Mission Area of the U.S. Department of Agriculture.

Currently the national goals are:

- Goal 1: An agricultural system that is highly competitive in the global economy.
- Goal 2: A safe and secure food system.
- Goal 3: A healthy, well-nourished population.
- Goal 4: Greater harmony between agriculture and the environment.
- Goal 5: Enhanced economic opportunity and quality of life for Americans.

b. Format: The five year plan of work should be reported in the appropriate matrix format, each cell of which identifies planned programs that fall under one or more of the national program goals.

c. Program Descriptions: Program descriptions presented in a narrative form or in each cell of the matrix for a planned program will be related to one or more of the five national goals. The twelve program initiative areas (PIAs) of Research and Extension are listed below with key themes presented for each PIA.

Major Program Initiative Areas for the Research and Extension Plan of Work in South Carolina

The following program initiative areas reflect the broad categories of program initiatives which are subsets of the USDA, SC State University and Clemson University goals. These contain key themes for reporting and they facilitate the linkages between research and extension program initiatives. A summary of expenditures by Goal areas has been provided.

1. Plant-based agriculture and industries (National Goals 1& 4)
2. Animal-based agriculture industries (National Goal 1)
3. Agrisystems management and profitability (National Goals 1 & 5)
4. Horticulture and home-based plant health management (National Goal 1)
5. Pest control and management (National Goals 1& 4)
6. Food safety and quality (National Goals 1, 2 & 3)
7. Food, nutrition and health (National Goals 2 & 3)
8. Natural resources and the environment (National Goal 4)
9. Community and economic growth, leadership and volunteer development, public policy and social issues (National Goal 5)
10. 4-H, youth development (National Goal 5)
11. Family strengths (National Goal 5)
12. Technology, innovation, and communication (National Goals 1,2,3,4 & 5)

Planned Research and Extension Program Initiatives by Major Program Areas

Goal 1. An Agricultural System that is Highly Competitive in the Global Economy

1. A. Plant Based Agriculture and Industries

Issues to be addressed:

Conventional agricultural practices affect environmental quality through tillage, fertilizer, irrigation, and pesticide use, which impacts watersheds and biodiversity. In addition, the state's population is rapidly expanding and becoming more urban. A result is the continued conversion of agricultural land into industrial use and housing, with declining environmental quality. Society needs an effective system of food and fiber production that sustains the environment and benefits people. A growing number of farmers have begun to adopt viable alternative practices with the goals of reducing input costs, preserving the resource base, and protecting human health. These practices tend to enhance rather than simplify the biological interactions on which productive agriculture depends.

Clemson University Research and Extension and The South Carolina State University 1890 Cooperative Extension promote programs and activities that preserve farmlands, conserve and foster sustainable agricultural policies and practices. Both institutions also encourage efforts that increase and satisfy consumer demand for foods that are grown on farms that employ such practices.

New and more profitable opportunities exist for small-scale farmers in the south who are willing to investigate alternative cropping systems. A recent survey of South Carolina consumers indicated that market opportunities exist for organically-grown crops and that potential markets are not limited to urban areas. Establishment of national organic standards in 2002 under the National Organic Program will create additional consumer demand for organic products and will be an additional incentive for farmers to consider a transition to organic production. Extension agents in South Carolina need training and experience in organic production in order to address the needs of organic and transition farmers. To develop whole farm systems, integrated systems' approaches utilize research findings of several disciplines and the experience of the farmer. A project which focuses on the competitive ability of small-scale farmers to integrate their production activities and target specialty markets for their output is important to South Carolinians.

South Carolina growers are facing low commodity prices and marginal profitability at best for most traditional row crop and horticultural enterprises, even in the presence of increased federal subsidies. The field crop program brings together a multi-disciplinary team of scientists to study all aspects of field crop production. These studies span the full range of field crops that play a major role in South Carolina, such as cotton, soybean, corn, and wheat. In addition, scientists are investigating methods for establishing flax as a new crop with significant economic potential for the state's agricultural and textile industries.

Crop improvement and weed control have been two of the major thrusts in agriculture for ages. An exploration into the role of acidity or alkalinity (pH ranges) that may accomplish crop improvement and weed control, without use of chemicals is needed. The acid rain, organic matter, herbicide and pesticide residues are some of the important factors that alter pH in the soil. The knowledge of soil pH on seed germination is extremely important to the physiology and distribution of plant growth. Nematodes are

serious economic pests of many crops, including peach. Better understanding of their relationships with their hosts and of the genetic basis of host plant resistance may lead to improved plant health and productivity. Development of genomic tools for peach will vastly improve practical use of this knowledge for sustainability of the crop. Data on the incidence of uncharacterized viruses, and on other characterized viruses that infect fruit crops, will be used to provide virus-tested sources of propagation material, to identify sources of infection, and to evaluate and implement IPM procedures for the control of these viral diseases in South Carolina and in the Southeast.

Greenhouse crops accounted for some \$200 million in cash receipts in South Carolina for 1999 and represented the second largest income-producing crop in the state after timber. Ornamental crop production is expected to continue to expand as demand grows for both residential and commercial landscape applications. The ornamental crops program addresses both nursery and greenhouse production systems. Areas of study include irrigation management and water recycling systems to control chemical run-off, the response of nursery crops to water and heat stress, the impact of light on plant growth and development, light management using retractable shade curtains, the use of landscape plants for bioremediation of nutrients and pesticides in run-off water, and the incidence and diversity of *Phytophthora* species in run-off and irrigation water at ornamental crop nurseries.

The Turfgrass Program Initiative at Clemson University is a multi-disciplinary program, involving many research, Extension and teaching personnel working together both on the Clemson campus and throughout the state of South Carolina. Turf production, establishment and maintenance whether on the sod farm, on the athletic field or on the golf course is an agricultural enterprise that is profitable. Turf is routinely supplied with fertilizers, treated with pesticides to control insects, pathogens and weeds, and is subjected to various agronomic tillage practices. Consequently, environmentally sound practices to forestall pollution of nutrients and pesticides in surface and ground water is being researched.

Agriculture continues to be one of the most deadly industries in the US. Not only are hundreds of people killed each year on the farm, thousands more are injured. Prevalence of hearing loss in rural areas is 11.1%, whereas in metropolitan areas it is 7.9%. The increased incident of hearing loss among farmers may in part account for this difference. Occupational hearing loss among agricultural workers and their families has been primarily associated with noise from farm machinery, but exposure to a number of chemicals have been shown to affect hearing loss also. The evaluation of the risks of combined exposure to noise and chemicals on the hearing loss of farmer and their families may help reduce hearing loss among farmers in South Carolina and other states. Extension efforts are focused on preventing these injuries and fatalities among our farmers, farm workers, and farm families. Efforts are being undertaken to both educate and increase awareness to issues associated with safety on the farm as well as health issues associated with farm life.

South Carolina will be conducting activities in the following specific key themes.

- A. Ornamentals
- Field Crops
- Fruit
- Turfgrass
- Sustainable Agricultural Production – Integrated Crop Management
- Organic Production Systems
- Farm Safety

- Sustainable Agriculture: Small Farms
- Farm Safety: Small Farms

- B. Retention of Small/Minority Farms
- C. Clemson University Activities Information Management System (CUAIMS)

Details on each of the key themes are presented below in the following categories:

- Performance Goals
- Outputs
- Outcomes
- Key Program Components
- Internal and External Linkages
- Target Audiences
- Program Duration
- Allocated Resources

Performance Goals:

1862 Research

(Key Theme: Ornamentals)

To improve the profitability of the ornamental horticulture industry, contribute to economic development, while minimizing the negative impact on the environment. Research projects will focus on the following:

1) Efficient water management systems will assist nursery producers to achieve optimum growth and reduce runoff, which is an increasing concern for public policy makers. 2) Understanding the response of nursery crops to water deficits and heat stress will improve success in transplanting trees in urban installations with low-maintenance conditions. 3) Identifying strategies for optimizing the delivery of light to crops grown in commercial greenhouses will enhance profitable operations in South Carolina and in the Southeast. Nursery and greenhouse growers will be able to use photoselective greenhouse covers or shade material to reduce the use of growth-regulating chemicals, thereby reducing production costs and potential risks to human health and environmental quality. 4) New systems utilizing phytoremediation can help remove pesticides and nutrients from run-off water at nurseries and greenhouses. Excess nutrients, pesticide displacement and water movement are environmental problems related to landscape plant production. Pesticides and excessive nutrient levels have been detected in nursery retention basins in the Southeastern US. 5) Integrated management strategies can be developed for diseases caused by *Phytophthora* in nurseries in South Carolina and the Southeast. 6) The most efficient fungicides and herbicides will be identified to improve production and efficiently reduce pesticide use.

(Key Theme: Field Crops)

To investigate aspects of field crop production including: developing new varieties; improving cropping strategies; protecting the environment; managing financial risks; reducing crop losses caused by nematodes, insects and weeds; and identifying the genes that improve natural resistance to damage caused by nematodes, insects and diseases. Enhanced understanding of the genetics of resistance to stressors will facilitate development of soybean germplasm and cultivars with improved seed yield and pest resistance and with the desired seed composition traits.

(Key Theme: Fruit)

Goals are to expand the genetic resources for cultivar development / enhancement through traditional and molecular technologies, to develop environmentally and economically sound production practices and to ensure a high quality, profitable, and marketable product.

(Key Theme: Turfgrass)

Clemson researchers are seeking ways to improve the quality of turfgrass through breeding and management techniques while they protect the environment by reducing the use of pesticides. New diseases and their potential to damage turf grasses will be characterized. Viable control practices for plant-parasitic nematodes in warm-season turfgrasses will compensate for the loss of traditional nematicides.

1862 Extension

(Key Theme: Sustainable Agricultural Production - Integrated Crop Management)

To provide programs that teach management skills to ensure economically and environmentally sustainable agricultural production systems.

(Key Theme: Organic Production Systems)

The overall objective will be to enhance the proficiency of Extension Agents, NRCS and DNR staff, other agricultural educators and professionals through training in areas related to organic production and certification. Participants in this training program will gain the necessary knowledge, skills and confidence that will enable them to guide growers/clients through the process of a transition to organic production, including certification requirements under the National Organic Program.

(Key Theme: Farm Safety)

To provide programs that teach farmers, farm workers, and farm families the hazards and health risk associated with the farm and means of dealing with these issues in a safe manner.

(Key Theme: Sustainable Agriculture)

To reduce off farm input and integrate natural processes such as nutrient cycling, nitrogen fixation, and pest-predator relationships into agricultural production processes. The above must have full participation of farmers and other rural people to ensure a profitable operation. The 1890 Extension Program will implement the following activities and programs which promotes sustainable agriculture practices.

- 1) Build a cooperative network of small farmers that support the development and adoption of sustainable agricultural practices.
- 2) Reduce the amount of pesticides used in agriculture.
- 3) Maintain soil quality, prevent the loss of topsoil, and farmland retention.
- 4) Promote agricultural practices that protect the quality and maintain adequate flows of water in rivers and streams.
- 5) Increase and satisfy consumer demand for foods that are grown through sustainable agricultural practices.

1890 Research

(Key Theme: Sustainable Agriculture)

To improve crops and control weeds by controlling soil pH.

(Key Theme: Sustainable Agriculture- *Small Farms*)

To evaluate the economic and biological feasibility of sustainable, integrated, small-scale Vegetable Farms in South Carolina.

(Key Theme: Farm Safety-*Small Farms*)

To study the levels and duration of farmers' exposure to farm noise, chemicals and solvents, and their possible interactions.

Output Indicators:

1862 Research

(Key Theme: Ornamentals)

The number and types of expertise involved in interdisciplinary research and extension programs to enhance the understanding of science associated with the production and maintenance of ornamental crops.

Amounts and types of resources by source.

Reports of the types of irrigation management protocols developed.

Records quantifying the response of nursery crops to water and heat stress.

Narrative report of the types of strategies developed to manage the light environment in greenhouses using retractable shade curtains.

Reports of the processes of technology developed for the spectral filter technology developed into a commercially acceptable option for greenhouse plant growth regulation through collaborations/partnerships with the plastics industry.

Records indicating the minimization of off-site movement of pesticides and nutrients resulting from the optimization of water collection and recycling systems.

Records indicating the response of nursery crops to water deficits and heat stress.

Evaluate fungicides for effective disease management in ornamentals and the tolerance of ornamental crops.

Reports of the evaluation of herbicides for effective weed management and the tolerance of ornamental crops.

Reports of the evaluation of ornamental crops for water use and water use efficiency.

Reports of the evaluation of ornamentals for remediation of nutrients and pesticides from run-off water from nurseries.

Irrigation management protocols to control nutrient runoff through precision water application.

Minimize off-site movement of pesticides and nutrients by optimizing water collection and recycling systems.

Quantify the response of nursery crops to water and heat stress.

Research reports of the basic mechanisms underlying the control of plant growth and development by spectral composition in light and quantify floricultural crop responses to light.

Reports of strategies to manage the light environment in greenhouses using retractable shade curtains.

Research reports conducted to determine the impact of hanging basket production on the greenhouse light environment.

Published reports of the development of spectral filter technology into a commercially acceptable option for greenhouse plant growth regulation through collaborations/partnerships with the plastics industry.

Research reports conducted to determine the incidence and diversity of *Phytophthora* species in run-off and irrigation water at ornamental crop nurseries and in natural waterways; on cuttings and liners used to propagate ornamental crops in nurseries; and in soils of natural, undisturbed ecosystems.

Reports of the evaluation of micropropagation requirements and protocols for ornamental crops.

(Key Theme: Field Crops)

Number of published research articles in peer-reviewed research journals.

Number of Extension publications based on peer-reviewed journal articles.

Narrative reports of new strategies developed to effectively utilize new technologies in flax harvesting and processing.

Research data sets quantifying the yield enhancement, input requirements, soil quality improvements, and environmental impacts of new cropping practices, precision farming technologies, transgenic varieties, and systems that integrate the three approaches.

Narrative report of the evaluation of grain yield of released varieties and advanced experimental strains of barley, oat, triticale, and wheat in statewide performance trials.

Narrative report of the evaluation of the bushel weight, plant height, maturity, pest resistance, and straw strength of small grains.

Narrative report of studies conducted to determine the feasibility of using transgenic cotton varieties in ultra-narrow row production in South Carolina.

Determine the ability of cotton varieties to recover from different severity levels of hail damage.

Report of the assessment of plant growth regulator effects on cotton plant growth and development.

Narrative reports of strategies developed to effectively utilize new technologies in integrated pest management for cotton and weed management.

Enhance understanding of plant-microbe interactions at the molecular level in order to enhance utilitarian functions performed by microorganisms in the rhizosphere.

Narrative report of the evaluation and identification of cost-effective weed management systems, including herbicides, for agronomic crops.

Narrative report of the evaluation of the potential of non-chemical weed control tactics and herbicide-tolerant crops for reducing herbicide use and input costs associated with weed control.

Reports of the technology developed for the detection and management of nematodes.

Assessment records of soybean cultivars adapted for resistance, tolerance, and high-market yields, indicating a change from baseline/benchmark measurements.

Narrative reports of strategies developed to effectively utilize new technologies in integrated pest management for cotton and weed management.

Narrative report containing the characterization of the genes involved in pathogenicity and host range of *Ralstonia solanacearum*.

Narrative report of site-specific management of cotton and soybean nematodes that optimize profits while minimizing the environmental impacts of production practices.

(Key Theme: Fruit)

Refereed journal articles

Number of patents and licenses

Varietal releases, germplasm releases

Narrative reports of research to determine the influence of tree training system, density, and rootstock on tree growth, yield, fruit quality and labor costs for peach trees.

Narrative reports of research trials in commercial peach and apple orchards in South Carolina.

Reports of the processes/technologies developed for the detection and management of nematodes in tomatoes and peaches.

Research reports on the efficacy of chemical and biological control agents to more effectively reduce peach disease.

Narrative reports of the evaluation of the importance of viruses, and the diseases with which they are associated, in crops of economic importance to South Carolina.

The numbers and types of expertise provided in the diagnosis of viral diseases in the entire spectrum of crop species grown in SC.

Narrative reports of the formulation of methods for the control of viral diseases.

(Key Theme: Turfgrass)

Refereed journal articles

Number of patents

Narrative report of the evaluation of new and existing cultivars of warm-season turfgrasses (*e.g.*, bermudagrass, zoysiagrass, centipedegrass, *St. Augustinegrass*, and *seashore paspalum grass*) to determine their susceptibility, tolerance, or resistance to nematodes that attack turfgrasses.

Narrative report of new technologies developed for the detection and management of turfgrass nematodes.

Develop integrated pest management systems and evaluate botanical/natural plant products to control nematodes in warm-season turfgrasses.

Evaluate rhizosphere bacteria as biological control agents for nematodes in warm-season turfgrasses.

Narrative report of the evaluation of the performance of new turfgrass species and cultivars for use in South Carolina.

Reports of studies conducted to determine the influence of diseases on the health of cool-season grass overseedings in commercial turfgrass installations.

Reports of studies conducted to determine the influence of diseases and disease-control strategies on fall establishment of cool-season turfgrass overseeded into bermudagrass and on the spring transition and health of the bermudagrass after transition.

Reports of studies conducted to determine the efficacy and feasibility of utilizing biological control agents to control mole crickets and imported fire ants in turfgrass.

Narrative report of the evaluation of experimental and currently registered insecticides for efficacy against mole crickets and imported fire ants in managed turfgrass.

Narrative report of the evaluation of biofumigation – utilizing soil-incorporated green manure crops and soil solarization – to control nematodes, insects, soil-borne fungi, and weeds in warm-season turfgrasses.

Research studies conducted to investigate the potential benefits of various soil amendments in golf-green construction.

Research studies conducted to investigate the potential benefits of using above- and below-ground air movement to maintain bentgrass (*Agrostis sp.*) in SC.

Reports of studies conducted to identify and minimize soil- and water-related problems that hinder the environmentally sound culture of plants. Specifically: 1) identify nutrient requirements of new plant cultivars and newly utilized species, 2) evaluate new technology for efficient nutrient delivery, 3) determine nutrient losses from plant systems, and 4) quantify the impact of salinity, sodicity, and alkalinity on turfgrass systems.

Narrative report of the development of viable control practices for plant-parasitic nematodes in warm-season turfgrasses to compensate for the loss of traditional nematicides (organophates and carbamates

earlier and methyl biocide in 2005).

Number of studies conducted to Examine the feasibility of using new, biological controls against these pests and of developing better traditional management strategies.

Identify and determine pathogenicity of causal agents of new turfgrass diseases in the Southeast.

1862 Extension

(Key Theme: Sustainable Agricultural Production - Integrated Crop Management)

Number of educational programs and activities conducted.

Number of people completing educational programs.

(Key Theme: Organic Production Systems)

Number of educational programs and activities conducted.

Number of people completing educational programs.

(Key Theme: Farm Safety)

Number of educational programs and activities conducted.

Number of people completing educational programs.

1890 Extension (Key Theme: Sustainable Agriculture)

This will be determined by training conducted with participating farmers, the farmers participating in the training, and the number of farmers adopting the practices.

1890 Research

(Key Theme: Sustainable Agriculture)

- 1) Number of publications in referred and non-referred journals.
- 2) Number of presentations at conferences and meetings
- 3) Number of trainings conducted with participating farmers, and assessment impact.
- 4) The number of farmers adopting pH practices, and their economic impact on farmers' yield and income.
- 5) Number of student involved at the undergraduate and/or graduate level in research and outreach work.

(Key Theme: Sustainable Agriculture - Small Farms)

- 1) Farmers' attitude/perception of involvement, and the economic benefit in establishing a small-scale vegetable production enterprise using various methods and techniques.
- 2) Farmers' interaction with multi-disciplinary team approach to integrated management practices.
- 3) Number of demonstrations and participants' assessment of integrated practices.
- 4) Identification of market locations for farmers to sell their produce.
- 5) Farmers' adoption of practices.
- 6) Number and extent of involvement for undergraduate and graduate students in research and outreach work as a result of this project.

(Key Theme: Farm Safety)

- 1) The number of farmers and their families found to be impacted by hearing loss due to noise or chemicals or both.
- 2) Establishment of a Hearing Health Program for Farmers.
- 3) Students' experiences and relationship to education aspirations.
- 4) Number of publications and presentations.
- 5) Development of on-going hearing health workshops, demonstrations, etc., through Extension Outreach Programming.

Outcome Indicators:

1862 Research

(Key Theme: Ornamentals)

The number of collaborative arrangements.

The number of inter/intra-institutional linkages.

Number of growers adopting practices that use photosensitive greenhouse covers or shade material to reduce the use of growth-regulating chemicals.

Number of new systems utilizing phytoremediation.

The development of new micropropagation requirements and protocols for ornamental crops.

(Key Theme: Field Crops)

Improved technology for field crop production in South Carolina

Improved potential for crop yields and sales values in South Carolina

Percentage increase of crop yields and sales production. Amount of sales due to improved crop yields.

Number of people adopting practices in field crop production.

An unbiased source of small grain variety/strain performance in South Carolina for growers, seedsmen, and Extension personnel will be provided.

The development of computer models used as tools to examine the impact of habitat fragmentation and reductions in pollinator numbers on native plant populations.

Number of published research articles in peer-reviewed research journals.

The weighted list of cotton IPM practices developed for the cotton survey.

(Key Theme: Fruit)

Improved varieties of fruit (% acreage adoption)

Employment of IPM (% acreage adoption)

Development of genomic tools for peach.

Data on the incidence of uncharacterized viruses and characterized viruses that infect fruit crops.

(Key Theme: Turfgrass)

Reported results of feasibility study for using new, biological controls against nematode pests and of developing better management strategies.

Best Management Practices will be available for fungicide use to control disease in creeping bentgrass (*Agrostis stolonifera* Huds.) putting greens appropriate for the southeastern United States.

Research-based Best Management Practices will be available for growing turfgrass in South Carolina, including recommendations for integrated pest management strategies and for effective and environmentally sensitive use of fertilizer, pesticide and water. Optimize disease-management for bentgrass and overseeded-bermudagrass to improve their success rate on Southeastern putting greens. Reports of studies that determine the suitability of new turfgrass cultivars for use in central and coastal South Carolina and develop environmentally sensitive management practices for conditions in this area of the state.

Report the genetic potential of the improved cultivars for efficient use of nutrients and define the performance and limitations of new nutrient delivery systems.

1862 Extension

(Key Theme: Sustainable Agricultural Production - Integrated Crop Management)

Percentage of people reporting increase in knowledge.

Percentage of people adopting recommended practices.

Percentage of acres brought under recommended management practices.

Number of growers adopting (or acres) converted to alternative agricultural enterprises.

(Key Theme: Organic Production Systems)

Percentage of people reporting increased knowledge.

Percentage of persons adopting practices.

Numbers of people completing programs who receive organic certification.

Numbers of people reporting satisfaction with recommended organic practices.

(Key Theme: Farm Safety)

Percentage of people reporting increased knowledge.

Percentage of persons adopting practices.

Percentage of persons reporting satisfaction with recommended organic practices.

1890 Extension (Key Theme: Sustainable Agriculture)

The number of small/minority farmers who integrate sustainable practices into their farming operation and the enhancement of the quality of water.

1890 Research

(Key Theme: Sustainable Agriculture)

Final Research Performance Report and the development of a soil test laboratory for small-scale, minority farmers, integrated with 1890 Extension's agricultural production programming.

(Key Theme: Sustainable Agriculture-*Small Farms*)

Final Research Performance Report and integration of workshops and demonstrations through continued Extension programming development targeted to small-scale farmers.

(Key Theme: Farm Safety)

Final Research Performance Report and Establishment of an on-going Hearing Health Program in collaboration with 1890 Extension Outreach Programming.

Key Program Components:

1862 Research

(Key Theme: Ornamentals)

1. Key program components include the development of interdisciplinary research and Extension programs to enhance the understanding of science associated with the production and maintenance of ornamental crops, improving the production and post-production efficiency of ornamental crops, optimizing water utilization by ornamental crops, improving quality of surface and ground water, developing pest management practices and production strategies that reduce chemical inputs and runoff, protecting the environment, and promoting sustainability.

The following faculty are the primary participants in the ornamental program, and they are listed with their respective research projects. Additional detail on each individual project can be obtained by accessing the project by number in CRIS. These research projects have been peer reviewed.

Bauerle	SC1700208	June 2007	\$127,378	Rajapakse	SC-1700232	June 2008	\$ 90,571
Faust	SC-1700135	June 2005	\$208,669	Whitwell	SC-1700199	June 2007	\$ 41,929
Jeffers	SC-1700177	June 2006	\$ 68,603				

Total \$537,150

(Key Theme: Field Crops)

Research projects related to field crops will focus on: developing strategies for crop production and pest management that enhance both productivity and profitability, identifying cropping methods that improve environmental quality, and examining new crops that could benefit the state's economy.

The following faculty are the primary participants in the field crop program, and they are listed with their respective research projects. Additional detail on each individual project can be obtained by accessing the project by number in CRIS. These research projects have been peer reviewed.

Chapin	SC-1700191	June 2006	\$164,628
Dodd	SC-1700171	June 2006	\$107,774
Edge	SC-1700152	June 2005	\$263,346
Frederick	SC-1700140	June 2003	\$134,179
A Johnson	SC-1700174	June 2006	\$ 22,982
Jones	SC-1700142	June 2004	\$ 74,291
Kluepfel	SC-1700141	June 2005	\$122,482
Knap	SC-1700102	June 2004	\$150,350

Miller	SC-1700201	June 2007	\$ 96,305
Mueller	SC-1700182	June 2006	\$196,608
Norsworthy	SC-1700160	June 2006	\$ 78,510
M. Shepard	SC-1700103	June 2004	\$141,299
E. Shipe	SC-1700197	June 2007	\$159,986
Sullivan	SC-1700222	June 2006	\$236,950
Turnipseed	SC-1700144	June 2005	\$ 236,477
Zehndr	SC-1700218	June 2006	\$ 51,170
Totals			\$2,327,337

(Key Theme: Fruit)

The scientists are developing integrated pest management practices to minimize the use of pesticides; producing chromosome maps to identify important genes in fruit production; and improving post-harvest handling technologies to ensure a high quality, safe product for consumers.

South Carolina is known for its abundant peach crops, but late freezes and a variety of pests can threaten production levels and growers' incomes. The fruit program was formed to address these challenges and to investigate new fruit industries for the state.

Alternate fruit and nut crops are also being evaluated to diversify South Carolina production, including Kaki persimmons, Nashi pears, Chinese chestnuts, and American paw paws. In addition, the researchers are studying integrated pest management practices to minimize the use of pesticides and are developing improved post-harvest handling technologies to ensure a high quality, safe product for consumers.

(Key Program Components, Key Theme: Fruit continued)

Clemson scientists have joined colleagues at North Carolina State University and the University of Georgia to create a Regional Virtual Small Fruit Center. The center will provide growers with production and pest management expertise from scientists at all three universities, via a web page based at Clemson. The following faculty are the primary participants in the fruit program, and they are listed with their respective research projects. Additional detail on each individual project can be obtained by accessing the project by number in CRIS. These research projects have been peer reviewed.

Albert Abbott	SC-1700120	June 2003	\$ 91,574
W.E. Brewer	SC-1700206	June 2006	\$ 23,567
A. Keinath	SC-1700161	June 2006	\$131,741
D. Layne	SC-1700101	June 2003	\$ 92,036
G. Schnabel	SC-1700159	June 2005	\$ 89,652
S. Scott	SC-1700195	June 2007	\$134,163
Total			\$562,733

(Key Theme: Turfgrass)

Innovative management techniques are being studied, including a spray that protects warm season grass from frost damage in winter and a subsoil aeration system that protects cool season grass from heat damage in summer. The scientists are also using genetic engineering to develop a Bermuda grass that stays green year-round.

Other studies are being conducted to control insects, weeds, and diseases in a cost-effective and environmentally sensitive manner. Investigations are being conducted on commercial installations, as

well as on research greens at the university's Pee Dee Research and Education Center in Florence and on the main campus

The following faculty are the primary participants in the turf grass program, and they are listed with their respective research projects. Additional detail on each individual project can be obtained by accessing the project by number in CRIS. These research projects have been peer reviewed.

Jim Camberato	SC-1700211	June 2007	\$129,693
Hale	SC-1700212	June 2007	\$ 79,305
Han	SC-1700185	June 2006	\$ 99,990
Bruce Martin	SC-1700168	June 2004	\$ 69,258
Bert McCarty	SC-1700163	June 2006	\$105,300
Total			\$483,546

1862 Extension

(Key Theme: Sustainable Agricultural Production - Integrated Crop Management)

The program focus will be on development and implementation of best management production practices which increase profitability and reduce environmental impact. Important components include: alternative enterprises, nutrient management, pest management, reduced tillage systems, water quality, and wildlife/biodiversity conservation. Educational techniques will include: field days, production meetings, demonstrations, website development, and workshops.

(Key Theme: Organic Production Systems)

This program will include information and education about organic farming practices.

(Key Theme: Farm Safety)

This program will focus on increasing the awareness of agricultural safety with special emphasis on farm tractors and machinery. These programs will include field days, educational meetings, demonstrations, workshops, and safety day camps.

1890 Extension (Key Theme: Sustainable Agriculture)

Society needs an effective system of food and fiber production that sustains the environment and benefits people. Farmers have begun to adopt viable alternative practices with the goals of reducing input costs, preserving the resource base, and protecting human health. Sustainable agriculture will focus on the following objectives:

- 1)To reduce the cost of livestock production through a grass based system.
- 2)To provide information about alternative farm enterprises to farmers and rural people
- 3)To provide farmers information about nutrient management to reduce cost of production and also minimize the opportunity for ground water pollution.
- 4)To produce all crops with biological insect control as an option.

1890 Research

(Key Theme: Sustainable Agriculture)

"Soil pH and Plant Growth," (SCX-420-18-98)

- 1) To study the pH of the groundwater from the top soil samples from select South Carolina Farmland.
- 2) To determine the optimum pH requirement for accelerating plant growth and yield, and optimum pH range for seed germination for selected plant species.
- 3) To measure the rates of water absorption in germinating seeds.
- 4) To compare the behavior of selected crop species with weed species in a diverse pH range.

(Key Theme: Sustainable Agriculture-Small Farms)

"Economic Evaluation of Sustainable Small-Scale Vegetable Farms in South Carolina," (SCX-522-07-98)

- 1) To evaluate the potential for marketing crops of small-scale farmers in specialty markets in South Carolina.
- 2) To determine the components within crop productions for a full integrated sustainable farm, relative to cost/benefit ratio.
- 3) To determine the economic feasibility for development and operation of a fully, integrated, sustainable, small-scale vegetable farm.
- 4) To determine impacts of sustainable, integrated agricultural management practices on natural resources (water quality, soil fertility) of participating farms.
- 5) To train and assist approximately 10 small-scale farmers and 1890 Cooperative Extension Specialists, on Sustainable Crop.

(Key Theme: Farm Safety)

"Occupational Hearing Loss Among Farmers and their Families: Effect of Combined Exposure to Noise and Chemicals," (SCX -310-02-99).

- 1) To determine the level and duration of exposure to noise and chemicals.
- 2) To determine their combined exposure effect on the hearing of farmers and their families, affecting auditory processing skills.
- 3) To estimate the probability of causing hearing impairment by the most commonly used farm machinery and chemicals.
- 4) To train Extension Agents on the effects of noise and farm chemicals on hearing, and on preventive measures, to help inform farmers of the risks and provide information for referring farmers to a Hearing Health Program.
- 5) To develop distance learning and research opportunities for students involved in a Farmers' Hearing Health Program.

Internal and External Linkages:

1862 Research

(Key Theme: Ornamentals)

Horticulture, Plant Pathology and Physiology, Entomology, Ag Engineering, Ag Economics, SC Department of Agriculture, regulatory agencies, chemical sales and equipment industries.

(Key Theme: Field Crops)

Horticulture, Plant Pathology and Physiology, Entomology, Ag Engineering, Ag Economics, SC Department of Agriculture, regulatory agencies, chemical sales and equipment industries.

(Key Theme: Fruit)

Horticulture, Plant Pathology & Physiology, Entomology, Ag Engineering, Ag Economics, SC Department of Agriculture, Regulatory agencies, processors, Virtual Fruit Center, NC & GA Land Grants, chemical sales and equipment industry, commercial producers, packers, limited resource farmers, hobbyists.

(Key Theme: Turfgrass)

Departments of horticulture, plant pathology, plant physiology, entomology, soils, agronomy, economics and toxicology, as well as the Cooperative Extension Service. State Departments of Health and Environmental control, Parks, Recreation and Tourism, Commerce and Natural Resources, Golf Superintendents Association and the Turf Grass Foundation.

1862 Extension

(Key Theme: Sustainable Agricultural Production - Integrated Crop Management)

Internal: Extension Personnel, South Carolina State faculty

External: Producers, other agency personnel, farmers, Farm Bureau, Farm Credit, Farm Services Agency, Agricultural Businesses, State Conservation Districts, NRCS, SC Dept. of Natural Resources.

(Key Theme: Organic Production Systems)

Organic growers, growers interested in transitioning to organic farming systems, educators, and others interested in organic production.

(Key Theme: Farm Safety)

Farmers, farm families, farm workers, community groups.

1890 Extension (Key Theme: Sustainable Agriculture)

Internal: Extension agents, School of Agribusiness and Economics.

External: The external linkages a relationship with Clemson Extension Service, North Carolina

State University Extension Service, and South Carolina Small Farmers Association and Sustainable Agriculture Research and Education (SARE).

1890 Research

(Key Theme: Sustainable Agriculture)

Internal: This project involves an internal, multi-disciplinary relationship with the Department of Biological Sciences, and the Department of Physical sciences, and the 1890 Extension Program.

External: External linkage involves selected, small minority farms in the testing of soil samples, crop and weed germination, improving test methods and assessing results on plant growth and yield, due to exposure to diverse pH ranges. Findings will be shared with farmers through cooperative relationships (i.e., demonstrations) through Extension Outreach Programming.

(Key Theme: Sustainable Agriculture - Small Farms)

Internal: This project involves internal, multi disciplinary linkages with the Department of Agribusiness and Economics, Department of Business Administration and Marketing, Department of Physical Sciences, Department of Biological Sciences, and 1890 Cooperative Extension.

External: Externally, the project involves multi-institutional cooperation with Clemson University's Department of Forestry and Resources, and participating small-scale farmers in select areas of South Carolina.

(Key Theme: Farm Safety)

Internal: This project involves an internal, multi-disciplinary linkage within the Departments of Speech Pathology and Audiology, Agribusiness and Economics and the 1890 Extension Program Component.

External: External linkages involves CSREES Specialists, relative to the effect of agricultural chemicals on health.

Target Audiences:

1862 Research

(Key Theme: Ornamentals)

Homeowners, commercial producers, equipment and chemical providers.

(Key Theme: Field Crops)

Producers, state agencies

(Key Theme: Fruit)

Urban and rural homeowners, commercial producers, the processing industry, packing houses.

(Key Theme: Turfgrass)

Urban and rural homeowners, commercial lawn care firms, golf course superintendents and owners, and growers.

1862 Extension

(Key Theme: Sustainable Agricultural Production - Integrated Crop Management)

Producers, Extension Personnel, farmers, farm firms, agriculture businesses, conservation districts, and the Department of Natural Resources.

(Key Theme: Organic Production Systems)

Organic growers, growers interested in transitioning to organic farming systems, educators, and others interested in organic production.

(Key Theme: Farm Safety)

Farmers, farm families, farm workers, community groups.

1890 Extension (Key Theme: Sustainable Agriculture)

Small and limited resource farms.

1890 Research

(Key Theme: Sustainable Agriculture)

Small-Scale, Minority Farmers.

(Key Theme: Sustainable Agriculture- *Small Farms*)

Small-Scale Farmers in South Carolina

(Key Theme: Farm Safety)

South Carolina Farmers and their families.

Program Duration:

1862 Research

(Key Theme: Ornamentals)

Five years

(Key Theme: Field Crops)

Five years

Key T(heme: Fruit)

Five years

(Key Theme: Turfgrass)

Five years

1862 Extension

(Key Theme: Sustainable Agricultural Production - Integrated Crop Management)

Short and Intermediate Term

(Key Theme: Organic Production Systems)

Short term and Intermediate term

(Key Theme: Farm Safety)

Intermediate term

1890 Extension (Key Theme: Sustainable Agriculture)

Long term program; 2004

1890 Research

(Key Theme: Sustainable Agriculture)

Short term: Expiration Date – May 15, 2003

(Key Theme: Sustainable Agriculture- *Small Farms*)

Intermediate: Expiration Date – May 30, 2003

(Key Theme: Farm Safety)

Intermediate: Expiration Date – September 30, 2004.

Allocated Resources:

1862 Research

Key Themes	FFY 2004	FTE's Faculty	FTE's Technical
Ornamentals	537,150	3.14	1.0
Field Crops	\$2,237,337	9.61	9.0
Fruit	\$562,733	2.71	5.0
Turfgrass	\$483,546	2.62	2.2

Allocated Resources for 1862 Extension Program Initiative 1 are summarized on page 30.

Allocated Resources for 1890 Research and Extension are listed by Goal areas on page 86.

B. 1890 Research and Extension (Key Theme: Retention of Small/Minority Farms)

Statement of the Issue:

The overall goal of this program is to assist socially disadvantaged farmers in reversing their economic decline through educational and technical assistance.

Presently, the decline of socially disadvantaged minority farmer's can be attributed to various social, economic and political conditions within the state. Chief among these are land loss, discrimination in access to credit, the insensitivity of government at the state and federal levels to effectively address the root causes impacting them, and the commitment to put into place the necessary impact plans that can provide comprehensive, yet prescriptive solutions. According to the 1997 Census, South Carolina has approximately 1,488 black operated farms compared to the 20,000 black-operated farms in 1964. Nationally, there were 900,000 black-operated farms in the United States in 1920 compared to approximately 23,000 today.

Thus, the latter figure represents about one percent or less of the total farm population in America. Research data continue to point to negative impacts that the farm crisis has had on socially disadvantaged farmers. This information indicates the need to not only improve their economic viability, but also to develop an effective outreach infrastructure that can continually assess, pinpoint, measure, evaluate and prescribe strategies to improve the plight of socially disadvantaged farmers.

Past studies on NAFTA analyzed its effects on a national level in participating countries and have largely ignored important possible effects of NAFTA on specific states or regions within countries. A South Carolina agricultural system that is highly competitive in the global market needs to assess NAFTA's affect across South Carolina and the Southeast region, relative to the fruit and vegetable trade impact. According to Census Data on export, South Carolina exported \$.685 billion worth of commodities to Mexico in 1996, with food products accounting for 65.5% of sales. The same year, South Carolina exported over \$1.27 billion worth of commodities to Canada. Given the high tariff imposed by Mexico, NAFTA is expected to have a significant increase in food product trade flows from South Carolina into Mexico and output and employment creation in the state. Of the four states in the southeast region, South Carolina has the highest exports of food products to Mexico.

Performance Goals:

1890 Extension

To reverse the trend of economic decline of small/minority farmers' and assist them with the retention of their farm land. To accomplish this goal, the plan seeks to:

- 1) encourage and assist socially disadvantaged farmers with owning and operating successful farm businesses,
- 2) enhance their access to effective agricultural programs, services and resources,
- 3) become recognized as integral parts of the economic development and sustainable forces that shape their communities. Specific focus will be given to the crisis of socially disadvantaged minority farmers in South Carolina, especially since the limited resources of these farmers appear to be rapidly declining.

1890 Research

To Compare the Impact of NAFTA on South Carolina and the Southeast Region.

Output Indicators:**1890 Extension**

- 1) Number of workshops, demonstrations, and tours conducted .
- 2) Number of farms adopting knowledge transfer.
- 3) Adoption of recommending practices.

1890 Research

- 1) Number of publications in referred and non-referred journals.
- 2) Number of presentations at conferences and meetings.
- 3) Number of training seminars/ workshops conducted to targeted audiences, and assessment impact.
- 4) The adoption of policy and/or trade options by Fruit and Vegetable Farmers in South Carolina, based upon findings, and their economic impact, as compared to the Southeast Region.
- 5) Course development in international trade.
- 6) Number of graduate students' graduating with a thesis, as a result of the project.

Outcome Indicators:**1890 Extension**

- 1) Farmers reporting increase income.
- 2) Farmers able to retain farms.
- 3) Number of farms adopting the record keeping and monthly cash flow plans.
- 4) Number who adopt information and integrate into their farming operation.

1890 Research

Final Research Performance Report and programmatic recommendations for development in Extension Outreach Activity to Fruit and Vegetable Farmers.

Key Program Components:**1890 Extension**

The delivery of information on following programs to small/minority groups and individually: marketing techniques, crop and livestock production education, risk management education, and farm safety.

1890 Research

"A Comparative Study on the Impact of NAFTA on South Carolina and the Southeast Region," (SCX-522-08-99).

- 1) To estimate the NAFTA dollar volume, output and employment trade creation in South Carolina's Vegetable and Fruit Industries.

2) To assess alternative trade policy options, and compare South Carolina's trade position in the Southeast Region.

Internal and External Linkages:

1890 Extension

Internal: Extension agents, and the School of Agribusiness and Economics.

External: SC Department of Agriculture, Clemson University, Natural Resource Conservation Service, Farm Service Agency, USDA Rural and Economic Development, USDA Department of Defense/School Lunch Program, SC Forestry Commission, and USDA Forestry Service. The following Governmental Agencies have joined a consortium to assist with a marketing initiative to assist small/minority farmers market fresh vegetables. The US Department of Defense, the US Department of Agriculture, the Office of Food & Nutrition, the SC Department of Education - Office of Food Service, and the SC Department of Agriculture - Marketing Division. US Department of Agriculture (NRCS) is providing office space and use of equipment. US Department of Agriculture (Rural Development) will provide some funds to assist with cooperative development, and the US Department of Agriculture Office of Farm Service Agency will provide training for staff.

(Internal and External Linkages continued)

1890 Research

Internal: This project involves internal linkage with the Department of Agribusiness and Economics, involving faculty development, curriculum development in international trade, graduate student practical training and outreach, and opportunities to promote thesis development at the graduate level.

External: External linkages with the South Carolina Department of Agriculture, in the area of the impacts of NAFTA on South Carolina food products and specialty crops, and support endorsed through collaboration with state agricultural departmental personnel in the areas of marketing and promotion, and export.

Target Audiences:

1890 Extension

Small and minority farmers

1890 Research

South Carolina Fruit and Vegetable Farmers; NAFTA Trade Officials at the State and Regional Level.

Program Duration:

1890 Extension

Long term program; 2004.

1890 Research

Short Term: Expiration Date - April 30, 2002.

Allocated Resources:

1890 Extension

Allocated Resources for 1890 Research and Extension are listed by Goal areas on page 86.

C. 1862 Research (Key Theme: Clemson University Activities Information Management System)

Issue to be addressed:

CU-AIMS, Clemson University Activities Information Management System, is a comprehensive, Internet-based, computerized information system that serves both research and extension. This system delivers pertinent information to all levels of the organization and to the general public. By delivering customized web pages and reports, CU-AIMS assists the faculty and staff in their research and Extension duties, delivers information so that administrators in both the Experiment Station and Extension Service can make better decisions affecting their areas and informs the public about the activities we and services of our organization.

Performance Goals:

The Internet-based system of CU-AIMS consists of three distinctive products – Information Management System (IMS), Professional Home Page (PHP), and South Carolina Growing (SCG). These three products have a unique mission that not only supports the administrative requirements of research and extension but also the faculty and our stakeholders. Like all three systems, IMS uses both university data and CRIS information to better summarize and report the activities associated with Public Service and Agriculture. Initially a system designed toward research data, IMS is slowly including extension data as part of its reporting capabilities.

Outputs:

Once the University's data warehouse has been completed, fully integrate CU-AIMS into this data source (estimated time of completion – January 2004).

Incorporate the departmental/program spreadsheets into CU-AIMS (estimated time of completion – 3rd Quarter 2003).

Expand “South Carolina Growing!” to include all established programs (estimated time of completion – on going project).

Fully develop and incorporate a performance measurement system for IMS to measure the performance of programs and faculty (estimated time of completion – 1st to 2nd Quarter 2004).

Outcomes:

Once completed, CU-AIMS, in conjunction with the acceptance and implementation of the

“program concept” of managing both research and extension activities, will be primary tool for reporting and managing all PSA activities (estimated time of completion – January 2004).

Once completed, CU-AIMS will be the benchmark for information management systems at land-grant universities (estimated time of completion – January 2004).

Key Program Components:

The following are the primary participants in the CUAIMS program and they are listed with their respective research projects. Additional detail on each project can be obtained by assessing the project by number in CRIS.

J. Clemens	State 1000176	June 2006	\$173,733
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(Key Program Components CUAIMS Continued)

The information management system, known as CU-AIMS, is well into its 2nd year of existence. All three components of CU-AIMS, the Professional Home Page (PHP), South Carolina Growing, and the Information Management System (IMS) are active and are on the web for use. PHP, the first product developed in the CU-AIMS suite of products, is being used by a number of faculty even though it has not been widely promoted. There is still some interest from the non-Ag colleges and departments across campus to have this system available for their use but as of this date, the details for such a move have not been finalized. A major hindrance for such a move is the development of a University-wide data warehouse. Currently, much of the data needed for many of the components within in CU-AIMS relies heavily on access to University data. With the University moving toward building a data warehouse, much of the help we have been getting from our campus data sources are being redirected toward data warehouse project. Although a data warehouse will be of tremendous help to us in the long term, we are suffering in this period of development.

In the year that South Carolina Growing has been under development, many changes have taken place. Our first attempt to develop South Carolina Growing via our contract with DCIT failed to live up to expectations. After several instances of fruitless undertakings with the contractor and after consulting the project leader of South Carolina Growing, it was decided to drop South Carolina Growing from the DCIT contract. This sent South Carolina Growing into a whole new direction and development process. The project leader, Debbie Dalhouse, developed a new prototype that was accepted. Although the new prototype was not as dynamic as the first SCG model, it was much easier to maintain and update. Presently, SCG is supplying information on six programs with more in the works.

The third product in the CU-AIMS family is the Information Management System. Although less than a year in development, the IMS has had the greatest impact on our organization and on Clemson. The IMS has successfully linked to the University’s financial and HR databases to supply our IMS users with up-to-date information. The design and methodology has been hailed as a tremendous asset to the Agriculture administration. Our success with this system has spurred the University to look at our system for possible use at other colleges within the University and

ultimately spurred the University to pursue the development of the university-wide data warehouse. IMS currently has over 50 users with interest growing daily. It has been taunted as a national model for land-grant universities using information management systems. Many other land-grant universities have expressed interest in the system for possible use at their institutions.

Internal and External linkages:

By design, CU-AIMS promotes the sharing and collaboration of data and processes. If not for this design and philosophy, CU-AIMS could not deliver the information it was designed to deliver.

CU-AIMS works very closely with the University to gather data and deliver this data via our trio of systems

CU-AIMS works with the faculty and staff of the newly established programs to foster collaboration with South Carolina Growing to promote the accomplishments of the programs and the faculty.

CU-AIMS collaborates with various levels of the administration to insure that the system is delivering the type of information needed to make informed and rational decisions.

CU-AIMS collaborates with various levels of CSREES to insure that this data is accurate and is properly represented in our system.

CU-AIMS joins forces with other state and federal agencies to acquire data for our systems.

Target Audiences:

The Professional Home Page helps bring in the needs of faculty. By giving them much of the information from within the administrators Information Management System, the faculty can now better understand the complexities associated with both research and extension. It also “opens the books” to all parties which help encourage collaborative efforts and cooperation. Other capabilities within PHP assist the faculty in many of the research and extension needs. New capabilities will be added as needed with the hope that this system will grow as their “one stop shop” for PSA research and extension.

“South Carolina Growing!” is the marketing component of CU-AIMS. Inspired by “Oregon Invests”, “South Carolina Growing!” takes the concept a step further in that it organizes our activities, both research and extension, into programs that are better understood by our stakeholders. Again, SCG uses the same databases as the other components and thus all the information throughout the system is uniform.

The Information Management System is specifically designed for administrators of Research and Extension activities. It can be used at various administrative levels of the organization from the Vice President level on down to the department chair, program manager, or county/region director. The IMS is the primary link to all the data sources used in CU-AIMS.

Program Duration: Five Years

Allocated Resources: Clemson University Activities Information Management System:

2003			
CUAIMS	\$173,733	1	1.5

Grant funds, revenue, and gifts will be expended for graduate students, technicians and equipment to address critical issues targeted by this planned program.

Summary of Allocated Resources for Program Initiative 1.

1862-Research:

Key Themes	FFY 2004	FTE's Faculty	FTE's Technical
Ornamentals	537,150	3.14	1.0
Field Crops	\$2,237,337	9.61	9.0
Fruit	\$562,733	2.71	5.0
Turfgrass	\$483,536	2.62	2.2
CUAIMS	\$173,733	1	1.5

Grant funds, revenue, and gifts will be expended for graduate students, technicians and equipment to address critical issues targeted by this planned program.

1862 Extension

Program Initiative Area 1:	FY 2003	FY 2004	FTE's
Plant Based Agriculture and Industries	\$1,879,897	\$1,879,897	28.61

Allocated Resources for 1890 Research and Extension Key Themes for Program Initiative Area 1 are listed on page 83.

2. Animal-Based Agriculture Industries

Issue to be addressed:

Agricultural technology advances have the potential to seriously alter the structure of agriculture in South Carolina. All segments of production agriculture are coming under increasing scrutiny by government regulatory agencies and the general public. One of the important emphases for the agricultural industry is the selection of appropriate technology to support a viable South Carolina agricultural system.

Specific projects will involve studies on animal health, environmental physiology, mechanical engineering, water quality management, alternative production approaches and production economics. Extension livestock programs focus on management options and practices to increase productivity, efficiency and profitability. Some production strategies include increasing the efficiency of forest utilization, using farm by-products/wastes for livestock feed, utilizing livestock, municipal or industrial wastes for pasture fertilization, and improving reproductive efficiency of livestock

The aquaculture program is a multidimensional effort to develop and disseminate information concerning the commercial production of aquatic species appropriate or potentially appropriate for production in South Carolina. Research is conducted on freshwater, estuaries and marine species (both fishes and invertebrates). In addition, small-scale farmers may be able to increase their income and provide pertinent information to evaluate the impacts of sustainable practices in aquaculture production.

South Carolina will be conducting activities in the following key theme areas:

- Aquaculture
- Animal Production Systems

Details on each of the key themes are presented below in the following categories:

- Performance Goals
- Outputs
- Outcomes
- Key Program Components
- Internal and External Linkages
- Target Audiences
- Program Duration
- Allocated Resources

Performance Goals:

1862 Research (Key Theme: Aquaculture)

To develop systems which will increase the economic viability of fish production and increase competitive margins, enhance water quality and reduce water quantity utilized in production systems, and enhance the design of systems which will enable landowners to profitably engage in aquaculture enterprises.

1862 Extension (Key Theme: Animal Production Systems)

Agricultural producers will be expected to be better stewards of the land and natural resources they utilize for production systems.

1890 Extension (Key Theme: Animal Production Systems)

Build a cooperative network of small farmers that support the development and adoption of sustainable agricultural practices.

1890 Research (Key Theme: Aquaculture)

To evaluate the economic and biological feasibility of a sustainable, integrated, small-scale Aquaculture Farm in South Carolina.

Output Indicators:

1862 Research (Key Theme: Aquaculture)

Research published in peer-reviewed research journals

Extension publications based on peer-reviewed journal articles

Design, construct and evaluate a salt-water version of the Partitioned Aquaculture System (PAS) for culture of marine species, including shrimp. This system will be enclosed in a greenhouse structure so that salinity and temperature can be maintained to simulate a tropical climate.

Develop a mechanical method of harvesting algae so that consistent control can be obtained. Apply this method to both fresh-water and salt-water aquaculture species, including shrimp.

Design and incorporate the PAS for improved control of water quality and automatic activation of emergency standby systems.

Install an automated data collection system.

Determine the filtration kinetics of tilapia and selected bivalves.

Determine the effects of filter feeders on the phytoplankton community and water quality in the PAS.

Determine the growth and survival of the filter feeders.

Assist cooperating research team members with an economic evaluation and the transfer of PAS technology.

Investigate the impact of columnaris disease on catfish culture and investigate methods of control.

Evaluate antimicrobial treatment options for columnaris disease.

1862 Extension (Key Theme: Animal Production Systems)

Number of educational programs and activities conducted.

Number of people completing educational programs.

1890 Extension (Key Theme: Animal Production Systems)

This will be determined by training conducted with participating farmers, the farmers participating in the training, and the number of farmers adopting the practices.

1890 Research (Key Theme: Aquaculture)

Farmers' attitude/perception of involvement, and the economic benefit in establishing a small-scale aquaculture production enterprise using various methods and techniques.

Identification of market locations for farmers to sell their fish.

Outcome Indicators:

1862 Research (Key Theme: Aquaculture)

Improved technology for aquaculture in South Carolina

Improved potential and expanded aquaculture industry in South Carolina.

Develop and offer the PAS concept as a modular, high-yield sustainable aquaculture practice for widespread application in the U.S. Previous work has demonstrated the feasibility of this technology in both research and commercial size units.

The PAS research program offers the potential to completely eliminate water discharge from shrimp culture and the potential threats to coastal water quality. It also allows increased aquaculture production for both fresh-water and salt-water species while simultaneously increasing the profitability of such

operations.

1862 Extension (Key Theme: Animal Production Systems)

- Percentage of people reporting increased knowledge.
- Number of participants adopting improved livestock health and reproduction programs
- Percentage of people adopting recommended grazing management systems.
- Percentage of producers improving their breeding programs by utilizing EPD's in sire selection and crossbreeding using breed complementary.
- Percent of acres brought under recommended grazing management practices
- Percent of acres with animal, municipal and industrial wastes applied
- Number of participants in the South Carolina Pride/Quest and other managed marketing programs

1890 Extension (Key Theme: Animal Production Systems)

The number of small/minority farmers who integrate sustainable practices into their farming operation and the enhancement of the quality of water.

1890 Research (Key Theme: Aquaculture)

Final Research Performance Report and integration of workshops and demonstrations through continued Extension programming development targeted to small-scale farmers.

Key Program Components

1862 Research (Key Theme: Aquaculture)

The researchers are investigating economically viable production systems for species, such as crayfish, tilapia, red drum, and southern flounder, and control of infectious disease in intensive aquaculture systems. Their research uses laboratory facilities, as well as the state's waterways, to study aquaculture, fisheries management, and environmental protection.

The following faculty are the primary participants in the aquaculture program, and they are listed with their respective research projects. Additional detail on each individual project can be obtained by accessing the project by number in CRIS. These research projects have been peer reviewed.

Arnold Eversole	SC- 1700189	June 2006	\$ 84,535
M Hammig	SC-1700092	June 2006	\$ 76,810
Tom Schwedler	SC- 1700193	June 2006	\$ 88,429
Joe Tomasso	SC- 1700187	June 2005	\$ 89,134
Total			\$338,908

1862 Extension: (Key Theme: Animal Production Systems)

The program will focus on (1) improving the production efficiency of animal systems, (2) improving marketing of livestock and (3) improving the utilization of residue, waste, and by-products for the development and implementation of agricultural production systems that are economically sustainable and environmentally sound.

1890 Extension (Key Theme: Animal Production Systems)

To reduce the cost of livestock production through grass based system.

1890 Research (Key Theme: Aquaculture)

- 1) To evaluate the potential for marketing fish of small-scale farmers in specialty markets in South Carolina.
- 2) To determine the components within aquaculture for a full integrated sustainable farm, relative to cost/benefit ratio.
- 3) To determine the economic feasibility for development and operation of a fully, integrated, sustainable, small-scale aquaculture farm.

Internal and External Linkages:

1862 Research (Key Theme: Aquaculture)

Department of Aquaculture, Fisheries and Wildlife, Department of Agricultural and Biological Engineering, Department of Agricultural and Applied Economics, South Carolina Department of Natural Resources, South Carolina Sea Grant Consortium, industry.

1862 Extension (Key Theme: Animal Production Systems)

Internal: Extension Personnel

External: Livestock and Commodity Groups, Environmental Action Groups. Producers, other agency personnel

Target Audiences:

1862 Research (Key Theme: Aquaculture)

Aquaculture industry, commercial producers, landowners, farmers, and the processing industry.

1862 Extension (Key Theme: Animal Production Systems)

Producers, Youth, City planners, county zoning boards, DHEC, Dept. of Natural Resources

1890 Extension (Key Theme: Animal Production Systems)

Small and limited resource farms.

1890 Research (Key Theme: Aquaculture)

Small-Scale Farmers in South Carolina

Program Duration:

1862 Research (Key Theme: Aquaculture)

Five Years

1862 Extension (Key Theme: Animal Production Systems)

Short and Intermediate Term

1890 Extension (Key Theme: Animal Production Systems)

Long term program; 2004

1890 Research (Key Theme: Aquaculture)

Intermediate: Expiration Date – May 30, 2003

Allocated Resources:

1862 Research

Key Theme	FFY 2004	Faculty FTE's	Technical FTE
Aquaculture	\$338,908	2.04	1.0

Grant funds, revenue, and gifts will be expended for graduate students, technicians and equipment to address critical issues targeted by this planned program.

1862-Extension

Program Initiative	FY 2003	FY 2004	FTE's
Area 2: Animal Production Systems	\$782,029	\$782,029	11.44

Allocated Resources for 1890 Research and Extension are listed by Goal areas on page 83.

3. Agrisystems Management and Profitability

1862-Extension (Key Theme: Risk Management Systems for Agricultural Firms)

Issue to be addressed:

A number of simultaneously occurring events combine to make carefully planned management of farms, agribusiness and the entire agricultural sector critical to continued growth and stability. These events include: 1) agricultural income growth which is almost entirely dependent on global markets, 2) an explosion of new technology that is reaching the marketplace, 3) the public is demanding a cleaner environment and increasingly concerned with maintaining a safe and nutritious food supply, 4) industrialization of the agricultural sector is proceeding rapidly: large and medium sized farms are growing and developing stronger vertical links to supply and to marketing firms, whereas small farms are struggling to survive, and 5) the federal government is drastically reducing its role of supporting and stabilizing the agricultural sector.

Changes in government regulations and the economic environment have increased the risks of farming in South Carolina. Agricultural firms today are forced to consider greater markets, financial, production, and environmental risks than in the past. These risks will require a significant change in farm management philosophy and also provide a challenge to develop risk-oriented educational programs. South Carolina will be conducting activities in Risk Management Systems for Agricultural Firms.

Performance Goals:

Teach management skills that ensure long-term profitability and sustainability for the farm business. Specifically, the focus will be on: 1) providing timely commodity situation and outlook information to assist in choosing appropriate market risk management strategies, 2) to provide educational programs to farm firms, agribusiness, and extension personnel on market assessment and appropriate marketing strategy selection of agricultural commodities, and 3) to develop, distribute, and educate in the use of computer-based market risk management tools, 4) to develop the “Executive Farmer” program to teach farmers business and financial planning, 5) to advance the “Farm Business Management Association” program to provide financial accounting, financial and business planning for member farmers, 6) to educate farmers on decision making and specifically how to use financial information to guide business decisions, and 7) how to ‘manage’ their businesses.

Output Indicators:

Number of activities/programs conducted
Number of people completing educational programs
Number reporting increased knowledge after completing programs
Number of programs conducted to number planned
Program completion and increased knowledge ratio
Specific indicators include: a) number of firms reduced losses, b) number of small farmers who avoided risks, c) number of farmers who have a business enterprise plan

Outcome Indicators:

Percent increase in levels of confidence in farm economic performance and family stability
Percent of farmers reporting increased income from previous year’s business
Percent of farmers that were able to retain land despite economic uncertainties
Percent satisfied with the services provided
Increased participation in future extension programs

Key Program Components:

Educational programs will be directed at teaching management skills that ensure long-term profitability and stability of farm business. These programs include: 1) business planning, creative problem solving, assessing business combinations and technologies for profitability while managing market and financial risks and maintaining the integrity of the environment, 2) economic analysis of enterprises and technologies, 3) business and financial management systems, and 4) develop and deliver “Executive Farmer” program.

Under this initiative, three projects are planned and these include Agricultural Market Risk Management, Economic Analysis of Enterprises and Technologies, and Business and Financial Management Systems. The Agricultural Market Risk Management project is designed to provide: 1) farm firms and agribusinesses timely commodity situation and outlook information to assist in choosing appropriate market risk management strategies, 2) farm firms and agribusinesses educational programs on market assessment and appropriate marketing strategy selection for agricultural commodities, 3) in service educational programs to extension personnel on market assessment and appropriate marketing strategy selection for agricultural commodities, and 4) develop, distribute and educate extension personnel, farm firms and agribusinesses in the use of computer-based market risk management tools.

The Economic Analysis of Enterprises and Technologies Project will help extension staff analyze alternative enterprises and technologies. Farmers and extension personnel will be provided training and experience on how to develop and evaluate the profitability of emerging agricultural technology, enterprises and production systems so that they can make informed decisions about the profitability of their farm businesses.

The Business and Financial Management Systems (BFMS) project will help commercial farmers to develop business and financial management systems suitable to their farms. A program called "Executive Farmer" has been developed to assist the farmers. In addition, extension agents will be taught the process and importance of business management systems under the "Executive Farmer" program. Agribusiness professionals will be able to help their customers about the importance of BFMS for business success.

Strategies to achieve this business, financial, and risk management initiative are to develop and deliver curriculum-based, holistic management educational programs. Delivery for these programs will be achieved through workshops, agent in-service training, regional meetings, video conferences and publications. Focus areas will include business planning, crop insurance, futures and options, financial

management, marketing and human resource management. Management skills and technical practices will be taught through curriculum-based programs, such as DairyMax, the Cow College, Southeastern Agricultural Lenders School, Computerized and Record Keeping.

Internal and External Linkages:

Internal: Extension agents, faculty and specialists

External: Farmers, Commodity groups, Agriculture Service Industry, Farm Management Association, SC Farm Bureau, Agricultural Lenders, Large and small agribusiness firms, and cooperatives.

Target Audiences:

Farm firms and agribusiness extension personnel, farmers, agriculture service industry, small farmers, and small farm families.

Program Duration:

Short Term and Intermediate Term

Allocated Resources:

1862 Extension

Program Initiative Area 3.	FY 2003	FY 2004	FTE's
Agri-systems Management and Profitability	\$627,015	\$627,015	5.04

4. Horticulture and Home Based Plant Health Management

1862-Extension Key Theme: Environmental Horticulture Education

Statement of the Issue:

Homeowners and communities can have difficulties in safely managing plant health to improve economic value of their homes and neighborhoods in a socially acceptable manner that does not contaminate the environment with excess fertilizer, inappropriate pesticides, or poisonous plants that would place human and environmental health at risk. Urban landscapes should be aesthetically pleasing, diverse, sustainable and environmentally friendly. The demand for information about this issue consumes an excessive amount of county resources/time. As the demand for home horticulture information continues to grow, new delivery systems must be developed to help a reduced Extension work force meet the needs. South Carolina will be conducting programs in Environmental Horticulture Education.

Performance Goals:

Extension will provide education to horticulture service providers (i.e. arborists, landscape designers, private and public grounds workers, urban foresters, and employees of landscape maintenance companies, landscape installation companies, tree service companies, and garden centers), Master Gardeners, and consumers on environmentally sound horticultural practices (i.e. plant identification, selection, culture, pest identification, and integrated pest management). The focus will be on extending environmental horticulture information through: (1) educating 3,500 horticulture service providers as multipliers to consumers, (2) training 150 Master Gardeners to contribute 2,500 hours of volunteer service to educate consumers, and (3) educate 85,000 consumers directly through communications technologies and mass media.

Output Indicators:

Output indicators will include the following:

- 1) Number of programs/activities conducted
- 2) Number completing educational programs
- 3) Number reporting increased knowledge

Outcome Indicators:

Outcome indicators will include the following:

- 1) Percent reporting increased knowledge
- 2) Percent adopting recommended practices in areas of pesticide record keeping, proper disposal of pesticide containers, etc.

3) Percent increase in knowledge regarding calibration of pesticide equipment

Key Program Component(s):

Key program components will be to train horticulture service providers and Master Gardeners to disseminate environmental horticulture information directly to consumers. Delivery systems include programs, activities, urban horticulture centers, diagnostic services and mass media including the WWW. Resulting education will impact quality of life, environmental health, and economic development.

Internal and External Linkages:

Internal: Extension specialists in Entomology, Horticulture, and Plant Pathology & Physiology and county faculty; demonstration sites at Sandhill and Pee Dee Research & Education Centers

External: South Carolina Nursery & Landscape Association, South Carolina Landscape & Turfgrass Association, International Society of Arboriculture, South Carolina Department of Agriculture Farmers Market Program, State Technical College System and local horticulture professional organizations

Target Audiences:

The primary audience is the South Carolina consumer with secondary audiences of horticulture service professionals and Master Gardeners that will serve as multipliers of educational efforts.

Program Duration:

Long Term

Allocated Resources:

1862 Extension

Program Initiative Area 4.	FY 2003	FY 2004	FTE's
Horticulture and Home-based Plant Health Management	\$1,257,751	\$1,257,751	24.81

5. Pest Control and Management

1862-Extension (Key Theme: Integrated Pest Management (IPM))

Issue to be addressed:

The purpose of the CUIPM Program is to facilitate the adoption of environmentally sound pest management practices by South Carolina farmers, rural and urban pest managers, and homeowners. South Carolina will be conducting programs in Pest Control Management.

Performance Goals:

Develop programs leading to the increased adoption and utilization of environmentally sound integrated

pest management practices among South Carolina agricultural producers and among producers of landscape and ornamental plants. The IPM programs for agricultural producers will center on Collard, Peach, Cotton, and Ornamental Landscape Pest Management.

Output Indicators:

- Number of educational programs and activities conducted.
- Number of people completing educational programs.
- Number of newly validated IPM-based production services, tactics, or practices available for use.

Outcome Indicators:

- Percentage of people reporting increased knowledge.
- Percentage of persons adopting practices.
- Number of acres where IPM strategies and systems are utilized.

Key Program Components:

These programs will focus on dissemination of information and knowledge about IPM strategies and systems. The South Carolina IPM programs will be Collard, Peach, Cotton, and Landscape and Ornamental Plant Pest Management. Environmentally sound IPM practices will be emphasized in all four program areas.

Internal and External Linkages:

- Internal: Extension Agents, USDA CSREES IPM Program
- External: Pest Management Specialists, Southern Region Pest Management Center

Target Audiences:

Agricultural Producers, pest managers, nursery owners, agricultural consultants and educators

Program Duration:

Intermediate Term

Allocated Resources:

Program Initiative Area 5.	FY 2003	FY 2004	FTE's
Pest Control and Management	\$70,105	\$70,105	.091

Allocated Resources for all 1862 Extension program initiatives in Goal 1 are listed below:

Program Initiative	FY 2003	FY 2004	FTE's 2003-04
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Areas (Goal 1)			
Plant Based Agriculture and Industries	\$1,879,897	\$1,879,897	28.61
Animal based Agriculture Industries	\$782,029	\$782,029	11.44
Agri-systems Management and Profitability	\$627,015	\$627,015	5.04
Horticulture and home-based Plant Health Management	\$1,257,751	\$1,257,751	24.81
Pest Control and Management	\$70,105	\$70,105	.091
Total	\$4,616,797	\$4,616,797	143.27

Goal 2. A Safe and Secure Food System

6. Food Safety and Quality

Issue to be addressed:

Foodborne illnesses in the United States has led to a major cause of economic burden, human suffering, and death (Healthy People 2000 Food Safety Objectives, 1995). While foodborne diseases, their causes and effects are better understood today, emerging risks need to be monitored for several reasons: 1) First, the food supply of the United States is changing dramatically, the conditions under which animals are raised have changed greatly. 2) Second, consumers are changing; there are an increasing numbers of elderly or immunosuppressed persons who are at higher risk of severe illness; an increase in eating food prepared away from home, the public's desire to consume raw, minimally processed, organic or exotic foods, children preparing snacks or part of the family's evening meal, the public's fear of technology, a more mobile population taking food with them and bringing food back from remote destinations or trying to duplicate a food consumed in another part of the world, and the desire to market and sell food products. Finally, new and emerging foodborne pathogens have been identified, which can cause diseases unrecognized 50 years ago. Each year, an estimated 6.5 to 33 million people become ill from microorganisms in food, and an estimated 9,000 of these individuals die.

Consumers are concerned about the safety of their food and only a limited number of them understand the process involved in safe handling and distribution of food. Such limited understanding can lead to hazardous food handling practices. According to the United States Department of Agriculture (1998), foodborne illnesses from meat and poultry alone account for \$5.2 to \$28.2 billion. Less than 5% reported and only 41% of the organisms are identified. During the fiscal year 1998-1999 South Carolina had an estimate of 150 cases of foodborne illnesses which also included complaints of symptoms related to foodborne illnesses.

A July 1997 United States Department of Agriculture (USDA) study showed that 96 billion pounds -over one quarter of the 356 billion pounds of food produced for human consumption in this country each year- is lost at the retail and food service level. Food security indicates the availability of food, while famine and hunger refer to the effects of the non-availability of food. Famine and hunger are the result of food insecurity. According to the World Bank in 1986, the availability and accessibility of food to meet individual food needs should also be sustainable.

Because of the reduced impact on human health and environmental quality, insect pest management techniques that include use of the insect's own chemical communication signals (pheromones) offer significant advantages over techniques using pesticides alone. Short-term results of pheromone-based control measures have been positive, and the damage caused by pests have been reduced. However, the long-term use of pheromone-based measures has received little attention. Using genetic analyses in identifying the chromosomal location of genes involved in the regulation of pheromones in fruit flies should be pursued. Information about the fruit fly may provide a basis for understanding the pheromone systems of economically important Dipterans and the identification of specific protein sequences involved in pheromone production and perception. As a result, researchers may be able to design specific inhibitors to these proteins that could be manufactured and used to disrupt mating in target species.

South Carolina will be conducting work in the following key theme areas:

- Food Safety Education for Consumers and Retail
- Food Safety and nutraceuticals
- Food Safety, Security and Quality

Details on each of the key themes is presented below in the following categories:

- Performance Goals
- Outputs
- Outcomes
- Key Program Components
- Internal and External Linkages
- Target Audiences
- Program Duration
- Allocated Resources

Performance Goals:

1862 Extension (Key Theme: Food Safety Education for Consumers and Retail)

To provide effective educational programs and training to South Carolina citizens and industries which increase knowledge and behavior toward safe food handling practices. Consumers and commercial food handlers in South Carolina are brought together to learn more about the quality and safety of the food supply. Commercial food handlers will be provided with technical assistance, which enhances food safety and quality for food industries. Instructors will be certified to train food handlers in safe food handling techniques. Extension agents will be trained on safe food storage, handling and preservation. Extension clientele will improve their understanding of risks and responsibilities in relation to food and health through increased knowledge.

1862 Research (Key Theme: Food Safety and Nutraceuticals)

The goal of the Food Safety Program Initiative is to develop or improve strategies for controlling or eliminating microbial pathogens (such as E. coli, Listeria and Salmonella) in foods, to apply those strategies to improve the safety and extend the safe shelf-life of food systems, to transfer the knowledge and technology to food industry professionals, and to significantly reduce food borne illness in South Carolina and the world.

In the area of Nutraceuticals, Clemson scientists are linking agriculture with medicine as they study plants used for herbal medicines. These dietary supplements merge the benefits of nutrition with pharmaceuticals and are known as nutraceuticals.

1890 Extension (Key Theme: Food Safety, Security and Quality)

Over the years, much emphasis has been placed on making sure that food is safe for consumption. Food security is needed to protect and prevent individuals from various germs that may affect foods. Also, preparation and care of food is significant to the well-being of the people we serve. The following objectives will be addressed:

- 1) Determine the program participants' knowledge and understanding of food safety and foodborne illnesses and intoxications.
- 2) Examine the program participants' perception of the nutrition health risks associated with foodborne illnesses and cross-contamination.
- 3) Design a Food Safety service activity for the 1890 Extension program.
- 4) Provide consumer education information to the program participants and general public regarding food affordability and accessibility, food recovery, and public policy issues affecting food access, and recovery.

1890 Research (Key Theme: Food Safety, Security and Quality)

To identify the chromosomal location of genes involved in pheromone production and mating selection of fruit flies.

Output Indicators:

1862 Extension (Key Theme: Food Safety Education for Consumers and Retail)

- Number of educational programs and activities conducted.
- Education of food handlers:
 - Number of instructors certified.
 - Number of food handlers completing an educational program and receiving a Certificate.
- Master volunteers food safety:
 - Number of volunteers completing training
 - Number of hours master volunteers spend teaching food preservation and safety.
 - Number of consumers reached by master volunteers
- Consumer food safety education
 - Number of consumers contacting Home and Garden Information Center
- Commercial food handling, processing, and packaging
 - Number of facilities advised of regulatory compliance changes

Number of participants completing programs on value-added commodities

1862 Research (Key Theme: Food Safety and Nutraceuticals)

Numbers of refereed journal articles, presentations abstracts, and awards.

Numbers of patents

Numbers and types of workshops, symposia, training sessions conducted.

Number of submitted and funded grant proposals targeting food safety.

Research reports on the improvement of meat-to-film sealant adhesion during meat and poultry product cooking.

Research reports of increased fresh meat and poultry color stability while reducing purge loss.

Research conducted to investigate light intensity, processing-packaging systems, and pigment concentrations for enhancing cured meat color retention and product shelf life.

Research reporting the measure effectiveness of antimicrobial packaging materials in food and non-food systems. Develop new packaging materials that can deliver an antimicrobial additive to the food surface to protect consumers from foodborne diseases and extend shelf life. Biopolymers or combinations of biopolymers with synthetic packaging films will be used.

Reports of the development of packaging systems and processing techniques to increase the safety and quality of poultry products.

Reports of research conducted to determine the efficacy of ozone to reduce biochemical oxygen demand (BOD5) and chemical oxygen demand (COD) in food processing plant wastewater that has high concentrations of fat, protein, starch or locust bean gum. (These chemical moieties represent different nutritional or additive families commonly used in the food industry.)

Reports of research conducted to determine the prevalence of E. coli O157:H7 and Salmonella on beef cattle farms in South Carolina.

Survey beef cattle farm water troughs in each county of South Carolina for E. coli O157:H7 and Salmonella. Determine the viability of these organisms during the four seasons.

Descriptions of partnerships established to develop natural antimicrobial (bacterocin) applications for acid whey by-products in the dairy industry for clinical use. Investigations include an antimicrobial food coating material, a flexible film material produced by a heat extrusion process, and a natural antioxidant containing flexible film material also produced by heat extrusion.

Numbers and types of communication of food safety information and food safety education to consumers, retailers, food handlers, industry and to other appropriate groups.

1890 Extension (Key Theme: Food Safety, Security and Quality)

1) Number of planned programs; number of participants, and programs' impact.

2) Comparative assessment of Food Safety and Food Security data by the state and national level.

3) Number of Food Safety Initiatives occurring in the county, state, and Cooperative Extension Organization.

1890 Research (Key Theme: Food Safety, Security and Quality)

1) The mapping of genes' location and pheromone variations.

2) The extent of resistance to pheromone-based control measures.

3) Number of conferences/meetings attended for information exchange.

4) Number of publications and presentations

Outcome Indicators:

1862 Extension (Key Theme: Food Safety Education for Consumers and Retail)

Percentage of people reporting increased knowledge of safe food handling practices.
Percent increase in adoption of recommended practices in food safety and handling
Percent facilities meeting HACCP requirements
Percent reduction in food-borne illnesses

1862 Research (Key Theme: Food Safety and Nutraceuticals)

Marinating fresh chicken is a value-added process and may offer a means of controlling yields and flavor impact in ready-to-serve products. When coupled with precooking prior to freezing, additional advantages may exist in ready-to-reheat and eat products.

Sensory analysis will provide key data to support marinating fresh chicken. Quantitative reflectance analysis of fresh ground poultry meat color, which differs from that of ground beef, may lead to packaging methods that will enhance the maintenance of visually acceptable product color.

Research reports of the development of an effective antimicrobial packaging film that can extend the shelf life and reduce growth of pathogenic bacteria in food.

Research reports of the development of a plan to reduce the presence of E. coli O157:H7 and Salmonella in beef cattle by establishing baseline data on their distribution throughout the state. These organisms infect beef cattle without visible symptoms and cause food-borne diseases in humans.

Research reports of the increased utilization of acid whey, a by-product of the U.S. cheese industry, and increase understanding of heat-induced reactions in protein-based packaging films.

Laboratory studies are analyzing the medically active ingredients in plants such as feverfew, ginkgo, echinacea, goldenseal, common mullein, black cohosh, and St. John's wort. Field studies are testing the commercial possibilities for South Carolina farmers to grow and process the herbs as a new product.

1890 Extension (Key Theme: Food Safety, Security and Quality)

- 1) Percent increase of program participants knowledge about Food Safety, Security, and Quality.
- 2) Percent of program participants demonstrating proper food safety and sanitation practices.
- 3) Percent of program participants promoting positive food safety practices within the community.

1890 Research (Focus Area: Food Safety, Security and Quality)

Final Research Performance Report.

Key Program Components:

1862 Extension (Key Theme: Food Safety Education for Consumers and Retail)

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. Special emphasis will be placed on Food Safety - Farm to Processing, including Biotechnology. Delivery of food safety information via volunteer and train-the-trainer efforts is an important extender of resources. Attention will be given to providing consumers with scientifically based, reasonable food safety information via the Making It Healthy media program.

1862 Research (Key Theme: Food Safety and Nutraceuticals)

Clemson scientists are investigating more effective safety measures in food production and processing. Their studies include using antimicrobial rinses to inhibit disease-causing bacteria in fresh meats and using proteins called bacteriocins that can kill bacteria and prolong shelf life in a variety of foods.

One bacteriocin being studied may inhibit spoilage in plant crops while they are in the field; another could protect food products against staphylococcus bacteria. The scientists are also investigating the genetic sequence of bacteriocins to determine exactly how these proteins work to inhibit bacteria.

Another area of study is a small pasteurization system for apple cider. If this system proves effective and economical, it could make roadside cider sales much safer by eliminating bacteria in the cider that can cause illnesses.

Food packaging films that fight bacteria and that are edible are among the innovations being developed by Clemson scientists. One study is testing the digestibility of heat-pressed films made from soy and corn protein that could be recycled as animal feed instead of being sent to landfills. Another study is testing a food packaging film that contains natural antimicrobial ingredients, which protect consumers against common meat-borne bacteria, such as *E. coli*, salmonella and listeria.

The scientists are investigating packaging films made from shrimp and crab shells that may also have medical applications, such as treating burns or wounds.

In another study, the researchers are seeking ways to improve the packaging used to ship fresh fruits and vegetables for distribution to grocery stores or as gifts to consumers.

To apply science to the popular herbal medicine movement, Clemson scientists are studying the growth and medically active ingredients in ginkgo, echinacea, goldenseal, common mullein and St. John's Wort. They are also investigating the possibility of producing these plants and extracting their useful ingredients for potential commercial applications by South Carolina growers.

Other studies are being conducted in cooperation with the Medical University of South Carolina to seek the specific compounds in raspberries, strawberries, grapes, and walnuts that inhibit tumor growth.

Laboratory studies are analyzing the medically active ingredients in plants such as feverfew, ginkgo, echinacea, goldenseal, common mullein, black cohosh, and St. John's wort. Field studies are testing the commercial possibilities for South Carolina farmers to grow and process the herbs as a new product.

In other studies, Clemson scientists are investigating methods of producing herbal plants in field plantings and using advanced micropropagation technology.

They are also working with colleagues at the Medical University of South Carolina to examine the ability of certain plant compounds to inhibit the growth of cancer cells in laboratory tests. These compounds are found in raspberries, strawberries, and blueberries that inhibit tumor growth.

The following faculty are the primary participants in the food safety and nutraceuticals program, and they

are listed with their respective research projects. Additional detail on each individual project can be obtained by accessing the project by number in CRIS. These research projects have been peer reviewed.

Kay Cooksey	SC-1700121	June 2004	\$ 22,527
Paul Dawson	SC-1700069	June 2003	\$ 44,271
R. Galyean	SC-1700166	June 2004	\$ 7,344
T. Hughes	SC-1700234	June 2008	\$ 49,633
J. McGregor	SC-1700165	June 2006	\$ 33,268
Ron Thomas	SC-1700237	June 2008	\$ 50,708
Total			\$207,751

Nutraceuticals

J. Adelberg	SC-1700158	June 2006	\$62,238
D. Camper	SC-1700225	June 2006	\$44,700
V. Haley-Zitlin	SC-1700104	June 2004	\$77,039
J. Rushing	SC-1700124	June 2005	\$122,671
Total			\$306,738

1890 Extension (Key Theme: Food Safety, Security and Quality)

- 1) Consumer education for safe food handling and food security
- 2) Food Safety Education for farmers, food service workers
- 3) Understanding foodborne illnesses & intoxications
- 4) Interrelationship of nutrition and foodborne illnesses
- 5) Certification training for food handlers (component of 1890 service activity)

1890 Research (Key Theme: Food Safety, Security and Quality)

"Genetic Evaluation of Insect Responses to Integrated Pest Management Techniques," (SCX-420-17-98).

- 1) To introgress Ta-Y into a Canton-S background.
- 2) To extend the genetic analysis of pheromones by males to recombination.
- 3) To link relationships between production of 7-tricosene by males and perception by females.

Internal and External Linkages:

1862 Extension (Key Theme: Food Safety Education for Consumers and Retail)

Internal: University PSA Personnel, USDA
 External: State Interagency Food Safety Advisory Committee
 Food Service and Food Processing Industry
 FDA

1862 Research (Key Theme: Food Safety and Nutracueticals)

Internal: Departments of Food Science/Human Nutrition, Packaging Science, Microbiology and Molecular Medicine, Animal and Veterinary Sciences, Chemical Engineering, Biological Engineering, Environmental Toxicology

External: SC Department of Health and Environmental Control, SC Department of Agriculture, Food Industry Association of South Carolina, North Carolina State University, University of Georgia, Auburn University, Alabama A&M, Texas A&M, and the Greenville Hospital System.

1890 Extension (Key Theme: Food Safety, Security and Quality)

Internal: Program Coordinator, Registered Dietitian, Microbiologist, Home Economists, Extension County Staff, Professor of Nutrition and Doctor of Veterinary Medicine, University Interns (Department of Family and Consumer Sciences), Small Farm Agent, Evaluation Specialist, and Clerical Support. Program Coordinator will oversee the entire program; Registered Dietitian will provide the nutrition consultation and staff training in food service management and nutrition; Home Economists will be trained as food safety and nutrition peer educators and will conduct the outreach educational programs; University interns will assist with conducting the food safety and nutrition education sessions, collect participation data, prepare reports and serve as a resource staff for the Home Economist; Small farm agent will serve as a resource staff for all the project personnel, and conduct workshops on small farmers; Clerical support will provide clerical assistance to the program coordinator in support of the food safety program; Microbiologist will provide staff training/workshops in the area of microbiology that relates to bacteria, viruses, parasites, and molds that may contaminate food; and the Professor of Nutrition and Doctor of Veterinary Medicine will provide curriculum implementation guidance and training support in the area of veterinary medicine and nutrition.

External: Department of Social Services, Department of Health and Environmental Control, and South Carolina Department of Agriculture.

1890 Research (Key Theme: Food Safety, Security and Quality)

Internal: This project is primarily a basic research effort involving internal linkages within the Department of Biological Sciences.

External: No external linkages are proposed during the project's duration, relative to involvement in the research effort.

Target Audiences:

1862 Extension (Key Theme: Food Safety Education for Consumers and Retail)

Food service managers and supervisors, food handlers, consumers and volunteer food handlers. Producers, Commercial food handlers, processing and packaging industry, consumers, youth, and media.

1862 Research (Key Theme: Food Safety and Nutraceuticals)

Food processors, food service operators, food handlers, food regulatory agencies, food packaging suppliers, food production personnel, consumers.

1890 Extension (Key Theme: Food Safety, Security and Quality)

- 1) Limited Resource Families (Orangeburg, Marlboro, Hampton, Williamsburg Counties)
- 2) Elderly (Orangeburg, Marlboro, and Hampton Counties)
- 3) Small Farmers (Orangeburg, Marlboro, and Hampton Counties)
- 4) FFNEWS eligible families and youth (Barnwell, Calhoun, and Orangeburg Counties)

1890 Research (Key Theme: Food Safety, Security and Quality)

Pesticide management researchers and applicators using genetic methods of pest control.

Program Duration:

1862 Extension (Key Theme: Food Safety Education for Consumers and Retail)

Medium Term to Long Term

1862 Research (Key Theme: Food Safety and Nutraceuticals)

Five years

1890 Extension (Key Theme: Food Safety, Security and Quality)

Food Safety Plan of Work Grant -Pending funding

- 1) Short term: 1 year based on annual federal funds
- 2) Program will be built off of a federal program already implemented

FFNEWS Program

- 1) Food Safety, Security, and Quality
- 2) Long-term: 5 years (1999-2004) on going during the entire time of the plan of work.

1890 Research (Key Theme: Food Safety, Security and Quality)

Short-term: Expiration Date – May 30, 2003.

Allocated Resources:

1862-Extension

Program Initiative Area 6.	FY 2003	FY 2004	FTE's
Food Safety and Quality	\$685,364	\$685,364	11.08

1862-Research

Key Theme	FFY 2004	Faculty FTE's	Technical FTE
Food Safety and Nutraceuticals	\$514,489	3.68	1.5

Grant funds, revenue, and gifts will be expended for graduate students, technicians and equipment to address critical issues targeted by this planned program.

Allocated Resources for 1890 Research and Extension are listed by Goal areas on page 83.

Goal 3. A Healthy Well-Nourished Population

7. Food, Nutrition and Health

Issue to be addressed:

The American Dietetic Association has stated that the dietary patterns of Americans differ widely, but most Americans eat a diet that could best be described as "in need of improvement." Research indicates that in 1998, Americans spent 51% of their food dollars in food consumed away from home. This is up from 25% of the food dollar in 1995. The vast majority of these dollars are spent at fast food restaurants where the meal choices are usually high in fat and sodium. A nationwide survey showed that 44% of Americans bring home a prepared meal at least once a week. A Gallup poll estimates that 1/3 of the US population will not know how to cook by the year 2005.

Americans are lacking knowledge in their basic nutrient needs and the skills needed in meal planning and food selection to meet these nutrient needs. The relationship of the risk of contracting of certain chronic diseases, such as coronary heart disease, stroke, diabetes, cancer and poor nutritional status is well documented. South Carolina has dismal health statistics. Heart disease, cancer, and stroke, accounts for nearly 2/3 of all deaths in the state. The heart disease death rate is 10% higher than the national rate and the minority heart disease death rate is 50% higher than the white death rate. Cancer death rates exceed the national average and the minority death rate is 40% higher than the white death rate. Stroke deaths in SC are considerably higher than the national average and the minority deaths are twice the rate for whites. The SC Department of Health has identified four at risk groups: African Americans, blue collar workers, youth, and lower-income groups. This department has stated that 80% of all cancers, 50% of heart disease deaths, and 50% of all stroke deaths are due to lifestyle habits.

According to the National Health and Nutrition Examination Survey (NHANES), 33% of adults in the United States are obese. Obesity-related medical conditions are the second leading cause of death in America (after smoking-related illnesses), resulting in 300,000 lives lost each year. The estimated annual health care cost due to obesity in the United States is about \$70 billion. Old eating habits and food preparation methods are hard to change. A much easier task is to establish sound dietary practices at an early age. Educational programs for youth and those people who affect the eating patterns of youth are essential, if the risk factors for chronic disease are to be avoided and if the SC health statistics are to improve.

South Carolina will be conducting work in the following key themes in Food, Nutrition and Health:

Food and Nutrition Education
Nutrition Education, Diet, and Health

Details on each of the key themes is presented below in the following categories:

- Performance Goals
- Outputs
- Outcomes
- Key Program Components
- Internal and External Linkages
- Target Audiences
- Program Duration
- Allocated Resources

Performance Goals:

1862 Extension (Key Theme: Food and Nutrition Education)

Provide food and nutrition educational programs for preschoolers and youth ages 5 - 19 which will improve their nutritional status, 2) provide educational programs to young adults/families which will improve their skills in choosing, preparing, and consuming a nutritionally adequate diet, and 3) work with food and nutrition related agencies and organizations to coordinate food and nutrition educational efforts.

1890 Extension (Key Theme: Nutrition Education, Diet, and Health)

A healthy mind may be developed through healthy eating habits. One has to nourish the mind as well as the body. To keep an individual healthy and wise, nutrition education is needed. The Nutrition Education, Diet and Health focus examines the following objectives:

- 1) Provide food and nutrition educational programs for families which will improve their overall health.
- 2) Provide nutrition education intervention that improves the utilization of foods commonly available in traditional recipes.
- 3) Enhance nutritional education through assessment practices.

Output Indicators:

1862 Extension (Key Theme: Food and Nutrition Education)

Number of programs delivered and audiences reached.
Number of people completing educational programs.
State summaries of food and nutrition program evaluations used in the county/cluster.
State summaries of telephone interviews concerning food and nutrition programs conducted by county staff.

1890 Extension (Key Theme: Nutrition Education, Diet, and Health)

Comparative assessment of Food and Nutrition program data by county and state.
Number of planned programs; number of participants, and programs' impact.

Outcome Indicators:

1862 Extension (Key Theme: Food and Nutrition Education)

- Percent increase in 4-H food and nutrition programs and events.
- Percent of program participants demonstrating knowledge gained.
- Percent of program participants reporting an increase in skills in choosing food.
- Percent of program participants demonstrating skill development in meal planning, food purchasing, and food preparation.
- Percent of program participants reporting behavior changes (telephone interviews).

1890 Extension (Key Theme: Nutrition Education, Diet, and Health)

- 1) Percent increase of program participants knowledge about Nutrition, Diet, and Health.
- 2) Percent of program participants adopting healthy lifestyle practices.
- 3) Percent of program participants adopting dietary analysis and nutritional assessment plans.

Key Program Components:

1862 Extension (Key Theme: Food and Nutrition Education)

Nutrition education programs will include Food and Nutrition Education and First Steps. These programs will focus on the Food Guide Pyramid and the Dietary Guidelines for Healthy Americans. Special focus needs to be given to programming in the prevention of childhood obesity, increasing physical activity in all ages, and the development of food preparation skills, which fit current nutritional needs and lifestyle. In addition, the delivery of nutrition information via volunteer efforts will continue as it is an important extender of resources.

1890 Extension (Key Theme: Nutrition Education, Diet, and Health)

- 1) Healthy Lifestyle Practices
- 2) Food Buying Practices/Enhancing Management Skills
- 3) Dietary Analysis and Nutritional Assessments
- 4) Food Preparation Demonstrations
- 5) Understanding Food & Culture

Internal and External Linkages:

1862 Extension (Key Theme: Food and Nutrition Education)

Internal: Extension Specialists, Extension County staff, College of Agriculture, Forestry and Life Sciences, College of Health, Education, and Human Development

External: SC Department of Education - Office of School Food Services, SC Department of Social Services - Child and Adult Care Feeding Program, SC Department of Health and Environmental Control - Office of Nutrition and Office of Health Promotion, private health and food related organizations requesting food and nutrition education assistance.

1890 Extension (Key Theme: Nutrition Education, Diet, and Health)

Internal: Extension County Staff, Program Assistants, Volunteers, Department of Family and Consumer Sciences and the Department of Biological Sciences. Extension County Staff will provide the outreach education programming for Nutrition, Diet and Health; Program Assistants from the FFNEWS Project will be trained as Nutrition Peer Educator for selected counties; Volunteers will assist the County Staff and the Program Assistants with their programs and/or workshops; Department of Family and Consumer Sciences will provide two (2) graduate students in the area of Nutritional Sciences will provide administrative duties, nutrition knowledge, and conduct classes that may lead to a potential Thesis topic, provide facility and equipment usage, and undergraduate FCS and Nutrition majors for internship experience ; and the Department of Biological Sciences will provide the staff training in the area of laboratory sciences as it relates to nutrition.

External: Department of Social Services, Council On Aging, Orangeburg Calhoun Technical College (Women Center) and a Multi-state effort between University of Arkansas-Pine Bluff, Prairie View A&M, South Carolina State University, Langston University, Lincoln University, and Southern University. Department of Social Services will identify potential individuals and/or families for the educational programming; Council On Aging will provide the senior citizen client and facility usage; and the Multi-states will provide quarterly newsletters and fact sheets; exchange of resource materials, standard curriculum among the consortium, conferences, and workshops for the FFNEWS Project. Orangeburg Calhoun Technical College (Women's Center) will provide facility usage, participants, recruitment, and staff assistance.

Target Audiences

1862 Extension (Key Theme: Food and Nutrition Education)

Preschoolers 0-4, Youth ages 5 - 19 years, and those people who affect the dietary habits of youth, i.e. child care providers, school food service staffs, teachers, young adults, consumers, families, EFNEP eligible families and youth, agencies and organizations associated with food and nutrition, the general public, and the media

1890 Extension (Key Theme: Nutrition Education, Diet, and Health)

- 1) Limited Resource Families (Hampton, Marlboro, Orangeburg, Williamsburg)
- 2) FFNEWS eligible families and youth (Barnwell, Calhoun, and Orangeburg Counties)
- 3) Senior Citizens (All the above counties)
- 4) Children: birth-5 years old (All the above counties)

Program Duration:

1862 Extension (Key Theme: Food and Nutrition Education)

The majority of programs will be long term; these programs should continue throughout the duration of the five-year Plan of Work.

1890 Extension (Key Theme: Nutrition Education, Diet, and Health)

FFNEWS Project: Short term: 1 year based on annual federal funds

Nutrition Education, Diet and Health: Long term: These programs should continue throughout the duration of the five years (1999-20004) Plan of Work.

Allocated Resources:

1862 Extension

Program Initiative Area 7.	FY 2003	FY 2004	FTE'S
Food, Nutrition, and Health	\$813,962	\$813,962	15.77

Allocated Resources for 1890 Research and Extension are listed by Goal areas on page 83.

Goal 4. Greater Harmony Between Agriculture and the Environment

8. A. Natural Resources and the Environment

Issue to be Addressed:

South Carolina has a wide variety of natural resources. However, the availability and the quality of these vast resources are constantly being diminished by the increasing demands of an expanding population. Based on state reports to the Environmental Protection Agency (EPA) about 49 % of the nation’s surveyed rivers, lakes, and estuaries are not clean enough for fishing or swimming (Allen 1995). Although Americans have made tremendous strides in the reduction of point source pollution, nonpoint source (NPS) remains as the greatest concern for impairment to our water resources. Future use and management of natural resources will require public education on water quality, wildlife, forestry, and other environmental issues.

Runoff from agricultural land is the biggest source of pollution of water resources. It is estimated that agriculture sources are responsible for 46 % of the sediment, 47% of the total phosphorus and 52 % of total nitrogen discharged into our waterways (Gianessi et al.,1986).

South Carolina has a total land area of 19.3 million acres. Of this, 4.6 million acres is in farmland. Croplands represent 2.5 million acres (53.6 %); woodlands represent 1.46 million acres (35.3 %); pasturelands represent .2 million acres (5.3 %); farmlands in Conservation Reserve and Wetland Reserve represent .2 million acres (4.8%); other lands in farms represent .3 million acres (5.8%).

Small Farms in South Carolina (1-99 acres in size) represent approximately 54.5 % of the total farm population. Educational programs, activities, and demonstrations will target natural resource concerns by addressing small and limited resource farms and farm families.

Changes in land use patterns are impacting the state’s resources in unplanned ways. 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. Environmental issues of land, wildlife and water will be addressed.

South Carolina will be conducting work in the following key themes in Natural Resources and the Environment

- A. Water Quality
Natural Resources and the Environment
- B. Sustainable Forest Management and Environmental Enhancement
- C. Reducing the Impact of Animal Agriculture on the Environment
- D. Household and Structural Pest Control and Pesticide Training

Details on each of the key themes is presented below in the following categories:

- Performance Goals
- Outputs
- Outcomes
- Key Program Components
- Internal and External Linkages
- Target Audiences
- Program Duration
- Allocated Resources

Performance Goals:

1862 Research (Key Theme: Water Quality)

The goal of the water quality program initiative is to develop strategies by which economically viable land use can coexist with good water quality. In order to accomplish this goal it is critical to characterize processes that control contaminant movement, contaminant bio-availability and toxicity, and contaminant degradation and assimilation by natural biogeochemical processes. The water quality program will have several research areas composed of related projects. Two such examples are Turbidity and toxicity. Turbidity is a measure of light penetration through water and in bodies of water. High turbidity levels generally indicate poor water clarity, and conditions are considered to be undesirable aesthetically. Some states are revising water quality laws to restrict sediment, leaving sites and use turbidity as an indicator of their impact. Toxicity of metals and pesticides information will assist environmental regulators to develop site specific water quality criterion for metals in surface waters.

1862 Extension (Key Theme: Natural Resources and the Environment)

Educate landowners to accept and use practices that promote sustainable use and management of natural resources. Specifically, the goal is to increase acceptance and use of current Best Management Practices. To provide educational programs to landowners on impacts of land management on water quality and on fish and wildlife resources. To provide educational programs to private land owners on wildlife damage management.

1890 Extension (Key Theme: Natural Resources and the Environment)

To increase the awareness, educate, and involve underserved communities, farmers and farm families,

the 1890 Extension Program will utilize and implement the following programs and activities which promote sustainability and management of natural resources:

- 1.) Utilize the 1890 Extension Program's "Demonstration of Forest Management Alternatives" to promote forest management to minority and non-minority landowners.
- 2.) To further expand opportunities for youth, ages 11-14, to learn about natural resources and the environment. An "Environmental Nature Trail" will be developed.
- 3.) Provide educational programs and demonstrations on Farm-A-Syst · Home-A-Syst: Develop Safe Drinking Water and Outreach materials and activities.
- 4.) Will develop an on-farm demonstration of Best Management Practices to provide educational workshops and tours on streamside management, soil nutrient management, and forage management.

Output Indicators:

1862 Research (Key Theme: Water Quality)

1. Measure the eroded size distributions for at least 24 soil series commonly found in the Southeastern U.S. using both a mobile rainfall simulator and a laboratory rainfall simulator. Compare the measured eroded size distributions with estimates obtained using equations.
2. Measure turbidity as a function of total suspended solids and soil series for soils common to the coastal plain, sandhill, and piedmont regions of the Southeastern U.S.
3. Characterize the toxicity of metals and pesticides in South Carolina surface waters.
4. Characterize the influence of natural dissolved organic matter on metal toxicity.
5. Characterize the influence of soil physical and chemical properties on nutrient transport.
6. Evaluate the influence of soil organic matter on contaminant degradation.

1862 Extension (Key Theme: Natural Resources and the Environment)

Number completing educational programs
Number reporting increased knowledge after completing programs
Number of programs conducted
Number of publications completed
Number of demonstrations completed

1890 Extension (Key Theme: Natural Resources and the Environment)

- 1) Number participants attending and completing workshops and demonstrations.
- 2) Number of training's and workshops, tours conducted to targeted audience.
- 3) The number of participants reporting adoption of practices.
- 4) The number of Publications completed.

Outcome Indicators:

1862 Research (Key Theme: Water Quality)

1. Design engineers and regulators will use better estimates of eroded size distributions when they design, model and evaluate sediment control structures such as sediment ponds to meet requirements of state and federal law.

2. Research relating turbidity to sediment concentration and source, illustrating some of the relationships that exist between sediment and turbidity.
3. Narrative reports on the relationship between dissolved organic matter and metal toxicity will allow state regulators to extrapolate national water quality criterion to S.C. surface waters.
4. Site specific water quality criterion for metals in surface waters.
5. Narrative description of information distributed to state regulators for use in recommending scientifically defensible animal waste management practices.
6. Narrative description of relationships established with regulators and land use planners to develop contaminant management and containment strategies.
7. Research published in peer-reviewed research journals
8. Extension publications based on peer-reviewed journal articles

1862 Extension (Key Theme: Natural Resources and the Environment)

Percent increase in use of BMP's
 Percent increase in use of water quality practices
 Percent increase in use of wise land management practices
 Percent increase in use of sound practices to limit wildlife damage
 Percent satisfied with services provided

1890 Extension (Key Theme: Natural Resources and the Environment)

Percentage increase in water quality practices among underserved communities.
 Percent increase of small and limited resource farmers in use of BMPs.
 Percent increase in forestry management plans.

Key Program Components:

1862 Research (Key Theme: Water Quality)

Scientists are working to balance economically viable development with good water quality in South Carolina. The researchers are studying the ways that housing developments, golf courses, agriculture, and urban development can cause movement of fertilizers, pesticides, and other contaminants into surface and ground waters.

They are also investigating the use of natural and man-made wetlands to remove and process these contaminants before they enter the state's waterways. These low-cost, low-energy, and low-maintenance best management practices will preserve the quality of our water resources and allow continued economic development throughout the state.

Ozone is being considered for disinfecting food processing wastewater. More specifically, work is underway to determine the efficacy of ozone to reduce biochemical oxygen demand (BOD5) and chemical oxygen demand (COD) in food processing plant wastewater that has high concentrations of fat, protein, starch or locust bean gum. These chemical moieties represent different nutritional or additive families commonly used in the food industry. This information is important for determining the resistance of certain microorganisms in food matrices when ozone is employed as a disinfecting agent.

The following faculty are the primary participants in the water quality program, and they are listed with

their respective research projects. Additional detail on each individual project can be obtained by accessing the project by number in CRIS. These research projects have been peer reviewed.

A. Greene	SC-1700219	June 2005	44,582
A. Khalilian	SC-1700242	June 2008	198,837
Steve Klaine	SC-1700106	June 2006	\$85,746
Steve Klanie	SC-1700179	June 2006	\$37,732
V. Quisenberry	SC-1700204	June 2007	\$65,633
Mark Schlautman	SC-1700133	June 2005	\$73,541
Total			\$506,071

1862 Extension (Key Theme: Natural Resources and the Environment)

Programs will include Water Quality and Quantity, Alternative Income Opportunities for Landowners, Recreation and Tourism, Master Wildlife/Master Naturalist, Urban Wildlife, Nuisance Species, and Coastal Natural Hazards. Special emphasis will be placed on education and implementation of Farm-A-Syst, Coast-A-Syst and Home-A-Syst programs, development of BMP's for shoreline business and recreation managers, development of water quality volunteer groups, development of Center for Wildlife Damage Control and Management, aquatic weed identification programs, and wildlife habitat evaluation.

1890 Extension (Key Theme: Natural Resources and the Environment)

- 1) Water Quality Education and Outreach. for Underserved Communities and Limited Resource Farm and Farm Families: " Safe Drinking Water Outreach and Education Program and Development and Demonstration of BMP's for Limited Resource Livestock Producers."
- 2) Development and Demonstration of BMP's for Limited Resource Forestry Landowners.
- 3) Natural Resource Education and Water Quality Education for Youth.
- 4) Environmental Justice: Targets water quality concerns and issues to address low income and underserved communities and families.
- 5) Forestry and Wildlife Management and Education.

Internal and External Linkages:

1862 Research (Key Theme: Water Quality)

SC Departments of Health and Environmental Control, Natural Resources, Parks, Recreation and Tourism, the Forestry Commission, Forestry Association, industry, growers.

1862 Extension (Key Theme: Natural Resources and the Environment)

Internal: Extension staff, faculty and specialists

External: South Carolina Department of Natural Resources

1890 Extension (Key Theme: Natural Resources and the Environment)

Internal: This program involves an internal, multi disciplinary relationship with the 1890 Extension Program, Department of Biological Sciences, Department of Agribusiness and Economics, and

Department of Natural Sciences.

External Linkages: South Carolina Forestry Commission, South Carolina Department of Natural Resources, USDA Forestry Service, South Carolina State Association of Small Farms, South Carolina Department of Health and Environmental Control: Source Water Protection and Education Program, USDA/Natural Resource Conservation Service, and Clemson University, School of Agriculture, Forestry, Natural Resources.

Target Audiences:

1862 Research (Key Theme: Water Quality)

Commercial producers, developers, golf course superintendents, land use planners, sludge and waste applicators, regulators, rural landowners, and forest industry.

1862 Extension (Key Theme: Natural Resources and the Environment)

Extension agents; urban and rural homeowners; private landowners, with small to large holdings; farmers; ranchers; poultry and swine producers; foresters; urban, suburban, and rural residents; farm and forest landowners; industrial landowners; shoreline business and recreation managers; resource managers; and home and garden clubs; youth and youth educators; volunteers; engineers; architects; agency personnel; wildlife specialists; government officials; recreation and tourism industry; and the general public.

1890 Extension (Key Theme: Natural Resources and the Environment)

South Carolina's underserved urban and rural communities and landowners, limited resource farms and farm families, youth (ages 11 – 14), and Extension Agents will comprise the target audience.

Program Duration:

1862 Research (Key Theme: Water Quality)

Five years

1862 Extension (Key Theme: Natural Resources and the Environment)

Short, Medium and Long Term

1890 Extension (Key Theme: Natural Resources and the Environment)

Both short and long term.

Allocated Resources:

1862 Research (Focus Area: Water Quality)

Key Theme	FFY 2004	Faculty FTE's	Technical FTE
Water Quality	\$506,071	2.86	.5

Grant funds, revenue, and gifts will be expended for graduate students, technicians and

equipment to address critical issues targeted by this planned program.

Allocated Resources for Key Themes in this Program Initiative Area for 1862 Extension are listed on page 66.

Allocated Resources for 1890 Research and Extension are listed by Goal areas on page 86.

B. 1862 Extension (Key Theme: Sustainable Forest Management and Environmental Enhancement)

Issue to be addressed:

Sustainable forest management and protection of ecosystems are critical to the economic and environmental well-being of the state of South Carolina. Forests cover two-thirds of the total land area of the state and provide resources for considerable economic activity. Annual value of forest products is nearly \$6 billion and the forest industry ranks fourth in total wages paid among all manufacturing segments in the state. While the economic aspect of forest productivity is extremely important, so are environmental concerns such as air and water quality, recreational resources, wildlife and protection of endangered species and the ecosystems that support them. With population growth, increased demand for production is seemingly at odds with preservation of environmental values. The challenge of providing increased wood and fiber production along with environmental quality will depend upon implementation of sustainable forest management practices by both private landowners and industry. Education and training will be necessary in order to develop a broad understanding of current problems and management options compatible with solutions.

Performance Goals:

Teach sustainable forest management concepts and practices to private landowners and industry in order to broaden these practices on all forest lands. The focus on private landowners will be to: 1) Provide landowners with information on alternative silvicultural systems that are compatible with sustainable forestry and will meet a broad array of landowner objectives, 2) provide landowners with forest management training and utilize them as volunteers to promote sustainable management among their peers, and 3) provide programming on the economic and environmental significance of ecosystem restoration and preservation. The focus on industry will be to develop and conduct training programs that improve the professionalism of logging and other timber operations businesses, and that promotes sustainable forestry principles.

Output Indicators:

- Number of educational programs and activities conducted.
- Number of people (landowners and professional resource managers) completing educational programs.

Outcome Indicators:

- Percentage of people reporting increased knowledge.
- Percentage of persons adopting practices.
- Acres with 25% increase in productivity. (Number of increased acres impacted by program practices)

Number of dollars earned or saved through adoption of program practices

Key Program Components:

The major programs under this initiative will be Alternative Silvicultural Systems, Restoration and Management of Longleaf Pine, Master Tree Farmer/Master Woodland Owner, and Broadening the Practice of Sustainable Forestry on all Forest Land. These programs will emphasize: 1) educational efforts to develop landowner understanding of even-age and uneven-age pine management, mixed pine-hardwood management and natural regeneration systems. Formal training on these subjects will also be given to forestry consultants and professional foresters that manages forest lands for private landowners, 2) the economic and ecological significance of restoring and managing the longleaf pine ecosystem, 3) expansions of “A Master Tree Farmer” program both within South Carolina and the southeast region, and 4) logger education and training on “A Best Management Practice,” and principles of sustainable forest management.

Internal and External Linkages:

Internal: Extension Faculty, teaching and research faculty

External: South Carolina Forestry Commission, South Carolina Forestry Association, Consulting foresters, Industry, landowners, and other cooperating universities in the southeast region

Target Audiences:

Non-industrial private forest landowners, consulting foresters and other forest resource managers, professional foresters, resource managers, general public.

Program Duration:

Intermediate Term and Long Term

Allocated Resources for Key Themes in this Program Initiative Area for 1862 Extension are listed.

C. 1862 Extension (Program Initiative: Reducing the Impact of Animal Agriculture on the Environment)

Issue to be addressed:

The greatest factor limiting the development of new and the continuation of existing animal enterprises in South Carolina is the impact they have on the environment. Concerns, both real and perceived exist relative to the ultimate disposition of nutrients in animal manure in the environment and the nuisance created from improper management of animals and animal manure. In addition, there are several other concerns that need to be addressed. These include land and water-based concerns such as nitrogen, phosphorus, and metals; nuisance concerns such as flies and odor; and political and social concerns such as property values, property rights, and local government.

Changes in government policy and the demands of environmental activists have increased training and record keeping requirements of animal producers. Modern production systems have resulted in the concentration of feed nutrients into small geographic areas. Care must be taken to prevent these nutrients from affecting the quality of air, water and soils of the state. To facilitate the growth of animal

agriculture and allow it to become vital to the economy of South Carolina, the issues involved around animal manure management must be resolved.

Performance Goals:

To increase the adoption of environmentally sound animal waste handling and utilization systems. The result will be a decrease in animal agriculture's impact on the environment, resulting in reduced public concern over the expansion of confined animal production.

Output Indicators:

Number of programs and activities conducted.

Number of people completing educational programs.

Outcome Indicators:

Percent of acres with animal wastes applied

Percent of acres with municipal/industrial wastes applied

Key Program Components:

Programs will focus on the increase in the adoption of practices that reduce nuisance and environmental impacts through the educational process. The topics addressed could include: control odors and vectors, protection of water quality, nutrient management, siting of facilities, and alternative waste handling practices. Emphasis will be on confined animal production facilities. However, development and demonstration of grazing systems to protect water quality are also of interest. The program will target training and certification of animal facility operators.

Internal and External Linkages:

Internal: Extension staff, both Clemson and S. C. State, including faculty from many departments

External: USDA-NRCS, SC-DHEC, SC Department of Agriculture, Farm Bureau, independent farmers and large integrated production units

Target Audiences:

Integrator related as well as individually owned and operated farm units, Agricultural Extension Agents, USDA-NRCS and SC DHEC Field Agents

Program Duration:

Short Term and Medium Term

Allocated Resources for Key Themes in this Program Initiative Area for 1862 Extension are listed on page 64.

D. 1862 Extension (Key Theme: Household and Structural Pest Control and Pesticide Training)

Issue to be addressed:

Changes in federal and state regulations and increased public environmental concerns, and concerns for human health have resulted in increased demands and expectations for

maintaining, if not increasing, the quality of our total environment. Those in agriculture and forestry, as well as the industries and individuals involved in constructing and protecting our nation's residential housing, industrial and storage structures, require a better understanding of regulations and management practices designed to protect the natural environment as well as the commercial and residential physical environments and human health.

Performance Goals:

The goal of this initiative is to increase the awareness and knowledge of a diverse clientele of safe and effective management practices that protect the natural and human altered and constructed environments. Specifically the focus will be on: 1) increasing clientele knowledge and implementation of safe pesticide application and responsibilities under pesticide regulations through Extension training and educational programs, 2) knowledge of structural design that is conducive to pest damage, 3) increase knowledge of wood destroying insect control alternatives, and 4) increased awareness of integrated approaches to pest management practices in human environments.

Output Indicators:

Number of educational programs and activities conducted.
Number of people completing educational programs.

Outcome Indicators:

Percentage of people reporting increased knowledge.
Percentage of persons reporting satisfaction with services provided (training, school, other.
Percentage of people better prepared to comply with regulations (regulations affecting specific clientele.)

Key Program Components:

These programs will center on Pest Control/Management Practices in human environments, wood-destroying insects pest control, and pesticide applicator training and education. These programs will include: 1) effective and safe pest control/management practices in human environments, 2) identification, prevention, and control of wood destroying insects, and 3) certification and re-certification training and education of pesticide applicators.

Internal and External Linkages:

Internal: County Extension Agents, Extension specialists, researchers, Department of Pesticide Regulation, and selected others
External linkages: State and municipal building inspectors, private inspectors, SCDHEC, SC Pest Control Association, farmers and grower organizations, and others

Target Audiences:

County Extension agents, Extension assistants, public and private building industry inspectors, builders and building industry contractors, building industry financial loaners, pest control operators, farmers and

growers, pesticide applicators, and others

Program Duration: Short term and medium term

Allocated Resources for Key Themes in this Program Initiative Area for 1862 Extension are listed below.

Allocated Resources: 1862 Extension (Program Initiative: Natural Resources and the Environment)

Program Initiative 8.	FY 2003	FY 2004	FTE's
Natural Resources and the Environment	\$1,456,264	\$1,456,264	22.06

Allocated Resources for 1890 Research and Extension are listed by Goal areas on page 86.

Goal 5. Enhanced Economic Opportunity and Quality of Life for Americans

9. Community and Economic Growth, Leadership, and Volunteer Development, Public Policy, and Social Issues

Issue to be addressed:

This program initiative addresses the need for increased leadership training and development in South Carolina's rural, transitional, and inner city areas. Transitional areas include counties at the fringes of metropolitan sprawls where the transition from agricultural to residential and industrial uses is taking place. Rural areas and inner city neighborhoods are frequently overlooked, ignored, or isolated from the benefits of sustained economic development in other nearby regions of the state. These areas characterized by flux or deprivation often lack progressive leadership which can foster a sense of teamwork and regionalism to address the locale's economic and quality of life concerns effectively.

Thinking is often dominated by turf related concerns and rigidity. A major component of the initiative addresses Business Retention and Expansion (BRE) needs in rural counties. The state is undergoing a major transformation from an agricultural and commodity-driven economy to a standard of living based on tourism, industrial expansion, and commercial development. Seventeen counties are classified by the state Department of Commerce as "Least Developed." Fifteen additional counties are considered as "Under Developed." These counties have large numbers of limited resource populations and many lie beyond easy commuting range to industrial areas. The BR&E approach to existing businesses in small towns meets a special need in rural areas. The probability of attracting a large international or national corporation to a remote location is low. The need is to keep existing industries and agribusiness enterprises satisfied and create an environment where expansion is a viable option. Many family and locally owned businesses in rural areas are experiencing increased competition from larger enterprises. To ensure that South Carolina stays competitive, greater emphasis will be placed on building the economic infrastructure of all counties within the state. This will require stronger collaborations and creative partnerships.

Public issues' education is tied to another important need at the county and regional level. A major need in the state is the formation and implementation of a countywide comprehensive plan which addresses utility infrastructure, land use, and environmentally compatible economic development. Public issues education and skilled facilitation of public meetings where conflicts often emerge among parties with different value systems and different objectives are an important need. As rural and transitional counties undergo the

transformation from agricultural to industrial and commercial economies, the resolution of public issue disputes become most important.

The Strom Thurmond Institute strives to be a recognized leader in providing information and assistance to citizen groups, business and special interest groups and governmental organizations at the local and regional level. The Institute sponsors research and public service programs to enhance civic awareness of public policy issues and improve the quality of national, state, and local government. The Institute is a non-profit, nonpartisan, tax-exempt public policy research organization. The Institute supports two of the Public Service Activities goals: Economic and Community Development and Environmental Conservation.

Another important issue for this goal area is welfare reform. Welfare reform efforts have required welfare recipients to work or engage in work-related activity as a condition for receiving assistance. The Personal Responsibility and Work Opportunity Reconciliation Act of 1996 is the most comprehensive welfare reform since the Social Security Act of the 1930's. An investigation of the impact of this Act on the material well-being of welfare recipients in South Carolina may find help those moving from welfare to work. According to this Act, a family's cash assistance may be reduced by 25% or terminated if a parent fails to cooperate in establishing or enforcing a child support order. It allows families to receive four months of transitional Medicaid if they lose eligibility for cash assistance due to increase child support and receive 12 months of Medicaid if the loss is due to increased earnings. States can deny assistance to additional children born or conceived while the parent is receiving assistance and to unmarried teen parents and their children.

South Carolina will be conducting work in key themes in Community, Leadership, and Economic Development. Details on each of the key themes is presented below in the following categories:

- Performance Goals
- Outputs
- Outcomes
- Key Program Components
- Internal and External Linkages
- Target Audiences
- Program Duration
- Allocated Resources

Performance Goals:

1862 Extension (Key Theme: Community, Leadership, and Economic Development)

A cross-section of local leaders is brought together to work on concerns at the county and regional level. Appropriate leadership training can create a "safe environment" where conflicting interests can be addressed constructively. A leadership development forum provides an opportunity where policies are addressed and action plans are formed. Local official and unofficial leaders must become educated about leadership and team building skills and new planning approaches with citizen participation to address community issues, concerns, and policies through Task Group structures. A major option is the implementation of the BR&E program. This entails using participants from the leadership program to survey existing locally owned and managed businesses to determine needs and concerns related to retention and expansion. The interview process could identify key public issue concerns and potential conflicts before they become pervasive in the community or county.

1890 Extension (Key Theme: Community, Leadership, and Economic Development)

The key to successful rural development is leadership. The decisions that are made are based on the type of leadership provided, whether it is good or bad. Communities are in need of good leadership. Community outreach is extended to limited resource individuals/groups within the various target populations. All programs and services are made available and accessible to increase knowledge and understanding. Communities, especially the rural areas, are helped to raise their standard of living through entrepreneurial and economic education. By working together, many ideas and resources are shared. Stronger collaborations and creative partnerships are needed to sustain economic stability.

1. To enhance the economic viability of rural and urban communities.
2. South Carolina communities will be afforded opportunities to grow through activities designed to facilitate leadership development and advancement. Toward that aim, specific goals are:
 - a) The provision of strategic planning for communities and community leaders in a minimum of 24 counties which will facilitate the development of specific action plans to counter identified problems;
 - b) The creation of new community-based organizations in a minimum of 24 counties; with approved incorporation and IRS 501(c)93) status;
 - c) The facilitation of growth and advancement in communities in a minimum of 24 counties through the action plans;
 - d) The provision of increased capabilities for internet access, e-mail, literacy, and entrepreneurship through technological, telecommunications programs

1890 Research (Key Theme: Community, Leadership, and Economic Development)

To help improve the quality of life of welfare recipients' movement from welfare to work.

Output Indicators:

1862 Extension (Key Theme: Community, Leadership, and Economic Development)

Number of people completing leadership program
Number of community leaders who have gained knowledge and skills related to leadership development
Number of people completing leadership program who acquired knowledge and skills regarding community and economic development principles
Number of people completing leadership program who plan to participate in a Task Group to address a community issue or concern
Number of people completing leadership program who collaborate with others in the region to address an issue or concern
Number of people surveyed in the BR&E visitation (survey) program
Number of participants in the PIMS (Public Issues Management School)

1890 Extension (Key Theme: Community, Leadership, and Economic Development)

- 1 a) Number of educational and training workshops and the impact of the workshops and training on the participants
- b) Number of strategic plans developed annually and the types of assistance requested and

provided

- c) Number of businesses provided assistance and the impact of the assistance to businesses
- d) Number of collaborations, partnerships and type of assistance provided

2 a) The development and maintenance of the communities assets database.

- b) A 10% increase in community volunteers in community programs
- c) A meaningful increase in diversity, gender, race, ethnicity, religion, age, socio-economic status) in participation and involvement in community projects
- d) An increase in collaboration and partnerships among the local community leadership and internal and external organizations.
- e) An increase in the financial support of community-based efforts.

1890 Research (Key Theme: Community, Leadership, and Economic Development)

- 1) The rate of human capital investment of welfare recipients.
- 2) The extent of welfare to work recipients' movement from welfare to work.
- 3) Impact of county level policy and implementation of welfare to work programs, and welfare recipients' successful transition.
- 4) Number of publications and presentations.
- 5) The number and extent of undergraduate and graduate students' involvement in research and outreach work with the project.

Outcome Indicators:

1862 Extension (Key Theme: Community, Leadership, and Economic Development)

Leadership programs will graduate 200 persons per year

Fifty percent of leadership program participants will engage in Task Group activities to address community issues and concerns

Leadership program Task Groups will formulate formal action plans and policies

Two news releases per year will be prepared per leadership program offering (class) at the county level

One hundred BR&E participants will be surveyed per year

Ten successful linkages will be established per year among BR&E participants and resource agencies.

PIMS will graduate 20 participants (Certified Facilitators in Public Issue Management)

1890 Extension (Key Theme: Community, Leadership, and Economic Development)

- 1. Outcome indicators will include quarterly and annual reports on program components' progress and impact.
- 2. It is desired that the community leadership program will yield successful strategic planning in each of the 24 counties. Evidence of this success shall be revealed in the following:
 - a) 10% increase community volunteers.
 - b) 12% of participants demonstrating knowledge gained through this process by providing leadership and capability to replicate the strategic planning process.
 - c) 12% increase in the number of community-based organizations with 501(c) (3) designations.
 - d) 12% increase in the number of community-based organizations generating external funding of

\$10,000 or more.

e) 12% increase in the degree of satisfaction with community leadership component.

1890 Research (Key Theme: Community, Leadership, and Economic Development)

Final Research Performance Report and recommendations based upon project findings that may lead to supporting extension programming educational activity in targeted counties.

Key Program Components:

1862 Extension (Key Theme: Community, Leadership, and Economic Development)

Community Leadership Development and its derivative programs provide training on group process skills. Components include leadership and team building skills, communication, group facilitation, group decision-making, conflict management, and problem solving skills. Technical strategic planning process skills include needs assessment, asset mapping, priority setting, tactical planning, public policy formation, and program implementation. Substantive data include information on statistical county socioeconomic profiles, trend analysis, economic development, education improvement, local government, public safety, health care, land use planning, growth management, recreation, tourism, and community cultural features.

Economic Development addresses small and locally owned or managed businesses. Much of the emphasis is on family owned business surveying and limited problem solving. The program activity includes: data collection, analysis of results, presentation of results, and facilitation of linkages to match business needs and resources located at public and private agencies from the local to the federal level.

Public Issue Education, through the Public Issues Management School, provides training on alternative dispute resolution approaches. Graduates qualify as Certified Facilitators. Extension must remain in the position of a neutral third party in public disputes involving land use, economic development, and environmental protection issues.

Community Enhancement and Improvement will emphasize improvement linked to community image, sustainable economic development, and improved quality of life, through tourism development, clean-up and beautification, and the identification of historical sites.

1890 Extension (Key Theme: Community, Leadership, and Economic Development)

1.

- a) Conducting educational and training workshops
- b) Strategic Planning
- c) Business development and management
- d) Community Outreach

2.

- a) A program of community betterment through the analysis of community assets and facilitating support for community asset-building: community involvement, community-based organizations, needs assessments, and action plans.
- b) A program module especially developed for community leaders;

- c) An economic development program that examines and subsequently works to facilitate the removal of barriers that negatively impact jobs, business development, entrepreneurship, and attendant programs;
- d) A technological/telecommunications arm that works to foster delivery of the other resources; universal internet and e-mail access, literacy, and economic development.

1890 Research (Key Theme: Community, Leadership, and Economic Development)

"Impact of the Personal Responsibility and Work Opportunity Reconciliation Act on Welfare Recipients," (SCX-121-01-98).

- 1) To determine the major factors involved in the implementation of the Personal Responsibility and Work Opportunity Reconciliation Act of 1996.
- 2) To examine the degree of program success at the county level.
- 3) To examine the impact of the act on the material well-being of welfare recipients.
- 4) To examine how welfare recipients cope with termination of public assistance.
- 5) To document the experiences of welfare recipients with public and private institutions.
- 6) To examine the human capital of welfare recipients.

Internal and External Linkages:

1862 Extension (Key Theme: Community, Leadership, and Economic Development)

Internal Linkages. The leadership program is operated through a departmental and extension service administration. Resources and interdisciplinary support are provided by staff and faculty in the Community and Economic Development Program at the Strom Thurmond Institute of Government and Public Affairs. Palmetto Leadership is a part of the Clemson University Public Service Activities special purpose unit, Economic and Community Development Initiative. Faculty in landscape architecture, accounting, secondary education, economics, applied economics, political science, sociology, planning, recreation and tourism, agriculture, and a number of other disciplines contribute to the program and serve on a speaker's bureau.

External Linkages. Sponsorship of the program occurs with local chambers of commerce, economic development agencies, and businesses. Speakers represent state, regional, and local agencies engaged in strategic planning, economic development, and human services. Links include the S.C. Departments of Commerce, Natural Resources, Health and Environmental Control, and Agriculture; USDA-Rural Development, Natural Resources Conservation Service, US Forest Service; S.C. Downtown Development Association, SC Association of Counties, S.C. Municipal Association; Councils of Governments; Strom Thurmond Institute, County Councils, Municipal Councils, Chambers of Commerce, and County Economic Development Offices, SC Arts Commission.

1890-Extension Program Initiative: Community, Leadership, and Economic Development

- 1. Internal:
 - a) Extension staff - expertise in helping to conduct educational and training workshops.
 - b) School of Business and Small Business Development Center - faculty and staff expertise in technical assistance and management.

External:

- a) Rural Development/USDA - partnership and outreach on housing issues, loan applications, and technical assistance to community organizations and local government officials
 - b) SC Department of Commerce/Community and Rural Development Division - partnership in conducting community strategic planning and technical assistance to community organizations and local government officials
 - c) Northeastern Corridor of Orangeburg Community Development Corporation - partnership in promoting community development in the areas of housing and community outreach.
 - d) Small Business Administration (SBA) - technical expertise in loan packaging and financial matters relating to small businesses.
 - e) Banks - partnership and community outreach related to home buyer's programs, Individual Development Accounts (IDA's) and loan packaging.
2. Internal: Extension Specialists, Extension county staff, SCSU Small Farmers Project, SCSU School of Business, SCSU Small Business Development Center
 External: USDA- Rural Development, USDA? Rural Business-Cooperative Service, U.S. Department of Housing, SEEDCO, South Carolina Office of Information Resources, County of Orangeburg, City of Orangeburg. First National Bank, First Union National Bank.

1890 Research (Key Theme: Community, Leadership, and Economic Development)

Internal: This project involves internal linkages within the Department of Political Science and History.

External: Externally, the project involves interaction with the South Carolina Department of Social Services and Welfare recipients identified as Welfare to Work Participants, and Social Services' State and County Level Officials.

Target Audiences:

1862 Extension (Key Theme: Community, Leadership, and Economic Development)

Community leaders, neighborhood leaders, elected and appointed public officials, interested citizens, and representatives of public and private institutions make up the audience for the leadership programs. Audiences are selected by an advisory committee and follow Extension Service audience selection criteria in terms of race, gender, and geographic distribution. Specialized programs may be designed to focus on limited resource audiences.

The BR&E program targets small, family-owned or managed businesses. Many of these business operators have less than 20 employees. Most are not able to leave their place of business to participate in educational programs, therefore, the service providers go on premises to interact with key personnel.

The public issues education program targets community leaders as well as interest groups in conflict, or citizens needing guidance with public policy formation objectives. Citizen interest groups often need to become educated on how public policy is formed and changed in a constructive and sustained manner.

1890 Extension (Key Theme: Community, Leadership, and Economic Development)

- 1.

- a) Small limited resource and minority businesses
- b) Rural and urban local government officials and administrators
- c) Limited resource and minority youth
- d) Community Development Corporations
- e) Community Leaders

2.

The intended audiences of this component are community leaders (both current and emerging), community volunteers, concerned citizens, local elected officials, and Extension staff.

1890 Research (Key Theme: Community, Leadership, and Economic Development)

Welfare to Work Participants and State and County Social Services' Officials.

Program Duration:

1862 Extension (Key Theme: Community, Leadership, and Economic Development)

Long Term

Community Leadership Development and its derivative, youth and specialized leadership programs designed for special audiences at the community and neighborhood level, have been in place for eleven years. The program is expected to continue for the next five years or more. The program curriculum and resource based is continuously updated in order to maintain its relevance. BR&E and PIMS have both been initiated in the past year and are expected to be continued for the next five years or more.

1890 Extension (Key Theme: Community, Leadership, and Economic Development)

1: The program will be long term.

2: 5 Years

1890 Research (Key Theme: Community, Leadership, and Economic Development)

Short-term: Expiration Date – December 31, 2002.

Allocated Resources:

1862 Extension (Key Theme: Community, Leadership, and Economic Development)

Leadership development staff includes one extension specialist, one extension associate, seven lead community development agents, and thirteen agents with a portion of planned time allocated to community development focusing on leadership and economic development activities.

1862 Extension Allocated Resources

Program Initiative Area 9.	FY 2003	FY 2004	FTE's
Community and Economic Growth, Leadership and Volunteer Development, Public Policy and Social Issues	\$717,927	\$717,927	11.50

1890 Research and Extension (Key Theme: Community, Leadership, and Economic Development)

Allocated Resources for 1890 Research and Extension are listed on page 83.

10. 4-H, Youth Development

Issue to be addressed:

Today's families are increasingly diverse, in that: Approximately one-half of all marriages end in divorce; the number of single-parent homes is increasing; the father is absent in 24% of homes of families with children; jobs may not provide adequate income to meet basic needs; children too often are left on their own without parental supervision, and; our elderly population is growing. On the national level, South Carolina ranks 48th for the percent low birth-weight babies; 47th in infant mortality rate (death per 1,000 live births); 43rd in child death rate (deaths per 100,000 children ages 1-14); 40th in teen birth rate (births per 1,000 females ages 15-17); 30th in juvenile violent crime arrest rate (arrests per 100,000 youths ages 10-17); 41st in the percent of teens who are high school dropouts (16-19); 44th in the percent of families with children headed by a single parent, and; 45th in the percent of children in poverty.

The State of South Carolina is in the process of examining the schools that serve students in urban and rural areas in general, and African-Americans in rural areas in particular. By comparing the perceptions of teachers in urban and rural areas as to teacher expectations, school climate and community involvement, pertinent information can be gathered that may be useful in teacher preparation programs, selection of teachers by school systems, professional development of teachers, and impact of teachers on school climate, student performance and community (parent) involvement.

Violence is a serious problem in American society. In South Carolina, it occurs with alarming and increasing intensity in all socio-economic levels and ethnic groups. Children and youth are demonstrating violent behavior to such an extent that safety has become questionable wherever they go- to school, in their neighborhoods, and even at home. Numerous factors account for violence, but the specific causes are non-definitive. A focus on the various factors that influence or determine adolescent violence or acting-out make help reduce this increasing problem. In 1987, it was estimated that 14% of 8th graders and 45% of 10th graders carried a knife to school, while 44% of 8th graders and 34% of 10th graders were involved in a physical fight. Today, these statistics may be staggering given the incident of violence in public schools in the United States.

South Carolina families and youth have basic life skills and developmental educational needs that can and should be addressed by educational programs offered by the Clemson University Cooperative Extension Service. The 4-H youth development programs offer a wide variety of programs and activities that can provide experiential learning opportunities for youth ages 5-19. Adults and family members can benefit from the youth's involvement in 4-H and may become involved as volunteers.

The Youth Learning Institute uses experiential education and natural settings to create innovative programs that assist in the healthy development of young people and adults. The Institute uses a variety of program models to teach valuable life skills to its participants. Programs range from planetarium visits to schools to two-week long residential camp experiences that provide students the ability to see and develop practical applications for the subject matter being taught.

Research in South Carolina has identified ten common family strengths in South Carolina families. Programs that enhance and help to develop these strengths are critical factors in the well being of families in South Carolina.

- There will be an estimated 979,500 children under age 18 by 2005.
- In 1995, it was reported that 57,000 children less than 18 live in poverty.
- South Carolina continues to produce more low birth weight babies.
- State juvenile violent crime has increased 220% since 1985.
- Teen birth rate has increased by 20% since 1985.
- Single parent families in South Carolina has increased by 15% since 1985

South Carolina will be conducting activities in 4-H, Youth Development.

4-H, Youth Development

Details on this key theme are presented below in the following categories:

- Performance Goals
- Outputs
- Outcomes
- Key Program Components
- Internal and External Linkages
- Target Audiences
- Program Duration
- Allocated Resources

Performance Goals:

1862 Extension (Key Theme: 4H, Youth Development)

To conduct educational programs to strengthen families and youth in South Carolina.

To provide materials and promote 4-H activities that strengthen and enrich life skill development of youth ages 5-19 years.

To recruit, train, recognize, promote, and value volunteers/ cooperators of Extension.

To develop and deliver innovative experiential learning programs that use outdoor settings and/or residential environments to educate young people in a variety of subject areas.

1890 Extension (Key Theme: 4-H, Youth Development)

Too many children are at-risk of not growing up to become self-supporting adults, good family members, and responsible citizens. Children are our future and they need to be nurtured and taught how to become respectable citizens of society.

- 1) Survey community based youth groups to determine level of assistance needed to strengthen organizational structure.
- 2) Plan programs for the youth groups that will serve as a recruitment tool and an opportunity to distribute information on improved well being.
- 3) Recruit and train volunteers to deliver programs on youth empowerment.
- 4) Assist community based organizations in creating partnerships and collaborations with local businesses and other social service agencies.
- 5) Coordinate frequent regional and statewide training sessions to reinforce skills for youth empowerment.
- 6) Provide opportunities for cultural enrichment and awareness of diversity and awareness of diversity

Output Indicators:

1862 Extension (Key Theme: 4H, Youth Development)

- Number of programs/activities conducted
- Number of people completing programs in the eight curriculum areas
- Number reporting increased knowledge as a result of participation
- Number of volunteers in various 4-H and youth projects
- Number of people participating in youth camping programs.

1890 Extension (Key Theme: 4H, Youth Development)

Number of planned programs, number of participants, program's impact as documented by accumulated data.

Outcome indicators:

1862 Extension (Key Theme: 4H, Youth Development)

- 1) Percent increase in knowledge gain
- 2) Percent adopting or practicing skills
- 3) Awards won in state and national 4-H programs
- 4) Percent increase in volunteers utilized in 4-H programming.

1890 Extension (Key Theme: 4H, Youth Development)

- 1) Percent decrease in the "at-risk" data among youth participants as compared to youth who do not participate in the programs.
- 2) Survey of community, parents and school officials on the observed behavior of participants

Key Program Components:

1862 Extension (Key Theme: 4H, Youth Development)

Programs, training and curriculum development in areas of Building Family Strengths will be conducted for Clemson Extension professionals, social service providers, counselors, teachers and other educators. 4-H programs, activities, and events will be conducted in support of the eight 4-H curriculum areas: 1) Communication and Expressive Arts, 2) Healthy Lifestyles, 3) Personal Development and Leadership, 4) Consumer and Family Science, 5) Plants and Animals, 6) Citizenship and Civic Education,

7) Environmental Education and Earth Science, and 8) Science and Technology. In addition, Teaching KATE (Kids About the Environment), Youth Leadership, Family, and Special Needs Camping are also major programs for youth.

The training and utilization of lay volunteers to work with Extension agents in implementing educational projects have long been a major program emphasis. Volunteers help maximize the work of Extension. They can also speak for Extension in public relations efforts.

1890 Extension (Key Theme: 4H, Youth Development)

- 1) Leadership development that will include goal setting, self esteem development and conflict resolution within community based settings utilizing the STAR program.
- 2) Academic enrichment and remediation through tutorial programs in after-school and Saturday programs.
- 3) Mentoring and counseling by college students for positive role models in the communities, on the college campus and via telephone and internet.
- 4) Culturally enriching programs and events on the campus and in locations across the state
- 5) Opportunities to interact with diverse cultures through the Association for Extension Administrators' Greater Racial/Ethnic Participation in 4-H Initiative.
- 6) Field trips to locations and events in the state
- 7) "Go for the Goal" to emphasize strategic planning for life success
- 8) "Citizenship Public Adventures" to reinforce skills needed for community participation

Internal and External Linkages:

1862 Extension (Key Theme: 4H, Youth Development)

Internal: Extension staff, faculty, specialists, EFNEP staff, South Carolina State University Cooperative Extension, College of Health, Education and Human Development, and Clemson Dropout Prevention Center

External: Citizens--youth and adult, Department of Social Services, Teen companions, Department of Juvenile Justice, Area Colleges, and Department of Education.

1890 Extension (Key Theme: 4H, Youth Development)

Internal Linkages: Youth program coordinator, Extension Associate for 4-H and youth, School of Education-Pre-Service teachers, County youth agents, Office of summer programs, Athletic department, Office of Admissions and Recruitment

External Linkages: County school districts, Department of Juvenile Justice, Department of Social Services, Local law enforcement agencies, community based organizations, youth groups, businesses, social organizations

Target Audiences:

1862 Extension (Key Theme: 4H, Youth Development)

4-H, youth, and families in South Carolina and Cooperative Extension Staff

1890 Extension (Key Theme: 4H, Youth Development)

Limited resource youth between the ages of 5-19 in 20 counties.

Program Duration:

1862 Extension (Key Theme: 4H, Youth Development)

Long Term

1890 Extension (Key Theme: 4H, Youth Development)

All programs will be designed for sustainability throughout the five year plan.

Allocated Resources:

1862 Extension

Program Initiative Area 10.	FY 2003	FY 2004	FTE's
4-H, Youth Development	\$1,639,531	\$1,639,531	30.80

11. Family Strengths

Issue to be addressed:

Dramatic social, demographic and economic changes have deeply affected individuals and families in this country. Extension will focus on strengthening individuals and families while addressing current issues facing children, youth, and families across the lifecycle. South Carolina families at all income levels need educational information that improves human relationships and helps them manage their resources more effectively. Family resource management programs will focus on increasing the knowledge, attitudes, skills, and confidence to apply effective and successful financial management and wise consumer strategies thus increasing the financial stability and security of families across the life cycle. Creating caring families and communities through collaborative efforts is a MUST if we are to meet the challenges today and beyond. This approach demands a team approach to programming that focuses on the needs of

the total family. Strong families provide children with a sense of belonging and identity and create hope for the future. In addition, utilizing effective volunteer management systems for working with volunteers is crucial to extending educational information to people and families to meet the challenges facing them and their communities.

South Carolina will be conducting work in the key theme area of families:

Details on each of the key themes is presented below in the following categories:

- Performance Goals
- Outputs
- Outcomes
- Key Program Components
- Internal and External Linkages
- Target Audiences
- Program Duration
- Allocated Resources

Performance Goals:

1862 Extension (Key Theme: Families)

To promote activities to which will help to strengthen family units, and to 2) increase the capacity of families to enhance their own economic well-being. Volunteer programs will focus on: 1) training and utilizing effective management systems for collaboration with agents, partners and clientele, 2) outreaching to non-Extension personnel and establishing linkages with non-Extension agencies and groups, 3) marketing the value of volunteer programs in Extension and with non-Extension agencies and groups, and 4) improving the cooperative relationship with South Carolina Family and Community Leaders and its volunteer leadership through the utilization of effective volunteer management systems.

1890 Extension (Key Theme: Families)

- 1) Provide family development and resource management educational programs to improve the well-being of the family structure.
- 2) Enhance parenting skills, managing resources, caring for children and dependent elderly family members through assessment skills.
- 3) Build partnerships within the community with public and private organizations.

1890 Research (Key Theme: Families)

To study the factors that influence the perceptions of teachers in rural and urban schools in South Carolina.

To study the various factors that influence or determine adolescent violence or acting out

To identify the variables associated with the dysfunctional levels of Single Teen Mothers and establish alternatives wherein they may become functional adults within society.

Output Indicators:

1862 Extension (Key Theme: Families)

Number of programs and activities conducted

Number of people completing Building Family Strengths programs.
Number of people completing Financial Security in Later Life programs.
Number of people completing Children Youth and Families At Risk programs.
Number of volunteers conducting programs.
Number of people reached by program volunteers.
Number of youth in resource management programs.
Number of youth in Building Family Strengths programs.

1890 Extension (Key Theme: Families)

- 1) Number of planned programs; number of participants, number of home visitations, and programs' impact.
- 2) Comparative assessment of Family development and resource management program data by national, county, and state.

1890 Research (Key Theme: Families)

RES1:

- 1) Comparative assessment of pre-service and in-service teachers and impact on targeted rural and urban schools, relative to students' ability to learn, school environments and community involvement.
- 2) Number of publications and presentations.
- 3) Development of methods for training pre-service and in-service teachers to meet special needs of rural and urban schools.
- 4) Number and extent of graduate and undergraduate student involvement.

- RES2:
- 1) The effects of mentoring in the earlier years and over time.
 - 2) The extent of decrease violence and acting-out behavior among participating mentees.
 - 3) The effect of mentoring by college-age mentors.
 - 4) Number of publication and presentations.
 - 5) Long-term benefit to children engaged in mentoring experience.
 - 6) The effect of mentoring to college-age mentors' educational goals and aspirations.

- RES3:
- 1) The effect of values, attitudes and beliefs of teen mothers on their quality of life.
 - 2) The impact of social and family support systems on teen mothers.
 - 3) Number of publications and presentations.
 - 4) Development of a pilot program for improving the quality and variety of social support to single teen mothers, during their transition to adulthood.

Outcome Indicators:

1862 Extension (Key Theme: Families)

Number of people reporting increased knowledge in Building Family Strengths Programs.
Number of people reporting increased knowledge in Financial Security in Later Life programs.
Number of people reporting increased knowledge in CYFAR programs.
Number of people adopting practices Building Family Strengths Programs.
Number of people adopting practices Financial Security in Later Life programs.

Number of people adopting practices in CYFAR programs.

1890 Extension (Key Theme: Families)

- 1) Percent increase of program participants knowledge about family development resource management.
- 2) Percent of program participants adopting resource management practices.
3. Percent of program participants understanding the ways in which community involvement can support the family structure.

1890 Research (Key Theme: Families)

Res. 1: Final Research Performance Report and development of training methods for pre-service and in-service teachers in rural and urban schools.

RES 2: The Final Research Performance Report and recommendations to Middle School Counselors, Teachers and Administrators for program development in addressing violence and acting-out behavior in the early adolescent years. Also, integration of recommendations with 1890 Extension Programming for modeling with youths involved in Extension Youth Programming.

RES 3: The Final Research Performance Report and development of a pilot program for single teen mothers, and recommendations for Extension Educational Programming involving single teen mothers.

Key Program Components:

1862 Extension (Key Theme: Families)

Emphasis will be placed on the following programs: Building Family Strengths, Financial Security and Stability, Resource Management for Youth, Volunteer Management and Leadership Development, and Children Youth and Families at Risk.

1890 Extension (Key Theme: Families)

- 1) Parenting skills
- 2) Management of Resources
- 3) Strengthening individual and family relationships
- 4) Providing quality care for children and elderly

1890 Research (Key Theme: Families)

RES1: "Comparison of Teachers' Perceptions of Academic Indicators in Rural and Urban Schools in South Carolina," (SCX-206-01-96).

- 1) To determine the perceptions of pre-service and in-service teachers in rural and urban schools in South Carolina.
- 2) To compare perceptions of pre-service and in-service teachers relative to students' ability to learn community involvement and school environment.
- 3) To develop methods for training pre-service and in-service teachers that address the special needs

of rural and urban schools and the communities they serve.

RES2: "Adolescent Violence and Acting-Out After a College Student Mentoring Experience in 5th and 6th Grades," (SCX-318-01-96).

- 1) To determine the impact of a mentoring experience with college-age mentors.
- 2) To determine the effects of mentoring in the earlier years on adolescents.
- 3) To assess the longitudinal effect of mentoring on adolescents in their later years in high school.

RES3: "Determinants of Perceptions, Aspirations and Goal Attainments Between Rural and Urban Single Teen Mothers," (SCX-824-03-95).

- 1) To examine values, attitudes and beliefs in relationship to goal setting/goal attainment and assess the impact of "Significant Others" on Single Teen Mothers.
- 2) To examine the structure of the social support system and its impact on the quality of life of single teen mothers.
- 3) To measure the impact of family support on the psycho-sociological well-being of single teen mothers, relative to the transition to adulthood.
- 4) To develop a pilot program for improving the quality and variety of social support to single teen mothers, during their transition to adulthood.

Internal and External Linkages:

1862 Extension (Key Theme: Families)

Internal: Extension Staff, faculty, specialists, CSREES

External: Consumer Federation of America, American Savings Education Council, AARP Legal Services Network.

1890 Extension (Key Theme: Families)

Internal: Extension County Staff, Department of Family and Consumer Sciences, Department of Psychology and Sociology. Extension County Staff will provide the outreach education programming; Department of Family and Consumer Sciences will serve as a liaison to the extension staff to provide training in the area of family life; and the Department of Psychology and Sociology will conduct workshop as it relate to human behavior and the family.

External: Department of Social Services, Department of Health and Environmental Control (DHEC), Department of Mental Health, Methodist Oak Home (independent and non-independent elderly) and Council On Aging. All the above agencies will assist with recruitment and recommendations of families based on their target audiences.

1890 Research (Key Theme: Families)

RES1: Internal: This project involves multi disciplinary internal linkages to the Department of Teacher Education and Counselor Education and Psychological Foundations.

External: Externally, linkages are established with teachers in rural and urban schools in four South Carolina counties.

RES2:

Internal: This project involves internal linkages with the Department of Nursing.

External: External linkages with a school district's middle school. The project staff is multi-disciplinary in skills involving counseling education and human service professionals.

RES3: Internal: This project involves internal linkages with 1890 Research and Cooperative Extension, representing a multi-disciplinary team approach, which includes rural sociology, counselor education and human service.

External: Externally, the project involves linkages with an area high school's Counseling Office and Counseling Professionals, and participating teen mothers.

Target Audiences:

1862 Extension (Key Theme: Families)

Families, adults, youth

1890 Extension (Key Theme: Families)

- 1) Limited Resource Families (Hampton, Marlboro, Orangeburg, Williamsburg Counties)
- 2) Senior Citizens (All the above counties)
- 3) Youth (All the above counties)

1890 Research (Key Theme: Families)

Rural and Urban School Teachers and Administrators.
Middle school students in early adolescence, middle school counselors, teachers and administrators.
Teenage mothers.

Program Duration:

1862 Extension (Key Theme: Families)

Long Term

1890 Extension (Key Theme: Families)

Long term: These programs should continue throughout the duration of the five year Plan of Work (1999-2004).

1890 Research (Key Theme: Families)

RES1: Short-term: Expiration Date – August 31, 2001.
 RES2: Short-term: Expiration Date – September 30, 2001.
 RES3: Short-term: Expiration Date – January 31, 2001.

Allocated Resources:

1862 Extension

Program Initiative Area 11.	FY 2003	FY 2004	FTE'S
Family Strengths	\$841,057	\$841,057	16.47

The following chart displays the allocated dollar resources for 1862 Extension Program Initiatives for Goal 5.

Program Initiative Areas for Goal 5.	FY 2003	FY 2004	FTE's
Community and Economic Growth, Leadership and Volunteer Development, Public Policy and Social Issues	\$ 717,927	\$ 717,927	11.50
4-H, Youth Development	\$1,639,531	\$1,639,531	30.80
Family Strengths	\$ 841,057	\$ 841,057	16.47
Total	\$3,198,515	\$3,198,515	58.77

Allocated Resources for 1890 Research and Extension are listed by Goal areas on page 83.

12. Technology, Innovation, and Communication (National Goals 1,2,3,4 & 5)

There are no Program Initiatives in this area.

Summary of Expenditures and FTE by Goal

Planned Expenditures

	Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Total
1862 CES	\$4,616,797	\$685,364	\$813,962	\$1,456,264	\$3,198,515	\$10,770,902
1862 AES	\$4,333,407	\$514,289		\$ 506,071		\$ 5,353,767
1890 CES	\$ 122,734	\$261,320	\$ 99,899	\$ 39,150	\$ 227,647	\$ 750,750
1890 AES	\$ 390,077	\$123,117		\$ 223,240	\$ 175,087	\$ 911,521

Planned Faculty FTEs

	Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Total
1862 CES	70.81	11.08	15.77	22.06	58.77	178.49
1862 AES	13.54	2.43		1.58		17.55
1890 CES	4.50	0.50	2.50	1.00	6.70	15.20
1890 AES SY's for Faculty and Staff	10.70	6.10	1.40	4.90	4.70	27.80

B. Components of the Five Year Plan of Work (Continued)

2. Stakeholder Input Process

1862 Research

The Experiment Station continues to participate in a constant exchange of information with commodity and environmental groups as well as foundations, the South Carolina General Assembly and collaborations with private firms. This information sharing network provides insight on a wide range of issues impacting the state and it is used in making program decisions on research initiatives.

1862 Extension

Section 102© of the AREERA Act of 1998 requires that land grant institutions provide information related to stakeholder input. The Act specifies that information on 1) actions taken to seek stakeholder input that encourages their participation and 2) a statement of process used by institutions to identify individuals and groups who are stakeholders and to collect input from them. At Clemson University, stakeholder input is key to successful extension programs. Clemson has a long history and tradition of seeking stakeholder input into the plan of work process. The process involved in seeking stakeholder input include: 1) identification of stakeholders—internal and external that should have input in the plan of work process, 2) process used in seeking stakeholder input, 3) plan of work questions for stakeholders, and 4) profile of external stakeholders.

Identification of Stakeholders—Internal and External:

Internal: Internal stakeholders include extension administrators, program administrators, county extension directors, extension agents, agent associations, specialists, faculty, department chairs, school directors, and faculty and administrators from Experiment Stations (Research).

External: Extension advisory boards, commodity groups, community leaders, human service providers, business/industry, and collaborators such as Farm Bureau, Chamber of Commerce, Farm Service Agencies, etc.

Process Used to Seek Stakeholder Input and Questions

Nominal group technique (NGT) was used to garner stakeholder input to the POW process. NGT is a process where groups of people come up with 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, all of the 46 counties were asked to conduct a NGT in their respective counties. 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 to get a cross-section of people that represent the local community. Fourth, a set of rules and procedures were established for smooth conduct of NGT. Fifth, a series of questions were identified for stakeholders to respond. Questions included: 1) What are the five most critical issues facing your communities in the next five years? 2) Is Extension addressing any of these issues? and 3) What partnerships do you think might be formed with Extension to address the issues or concerns? The responses to these questions were summarized by county, by cluster and by state as a whole. The sixteen initiatives and 70 projects are a result of this process which were later included in the strategic goals of Public Service and Agriculture (PSA) in South Carolina.

Profile of Stakeholders

Of all the external stakeholders, extension advisory boards play a significant role in the POW. Extension advisory board members constantly provide input to Cooperative Extension in South Carolina. A profile of advisory board members would help address the diversity issue. Of the 237 advisory board members who provided input, 48% were male, 52% female; 81% Caucasian, 15% African-American, and 4% other. Regarding age, 5% were less than 35 years of age, 46% between ages 36 and 55 years, and 49% more than 55 years. Eighty-four percent were married and living with a partner. Regarding education, 15% had completed high school, 18% some college, 35% were college graduates, while the remaining 32% held masters or professional degrees.

A study conducted by Dukes (1999) on the Expectations of Public Service at Land Grant Institutions for the 21st Century by traditional and non-traditional audiences in South Carolina found that important issues facing communities in South Carolina are: 1) growth and population, environment, community and economic development, agriculture productivity, family issues, and food, health and nutrition.

1890 Research and Extension

Section 102(c) of the AREERA Act of 1998 requires that land grant institutions gather and provide information related to stakeholders. The Act specifies that information on 1) actions taken to seek stakeholder input that encourages their participation and 2) a statement of process used by institutions to identify individuals and groups who are stakeholders and to collect input from them.

South Carolina State University 1890 Research and Cooperative Extension sought stakeholder input from 1) the community at-large, 2) County Advisory Committee Members, 3) Research and Extension administrators, 4) Extension Agents, and 5) 1890 Research and Cooperative Extension staff.

A portion of the 1890 Research and Cooperative Extension Summer Retreat served as training for all 1890 Research and Cooperative Extension Administrators, Agents and staff to become facilitators in public stakeholder input forums. During the training, all attendees completed the process of identifying what they felt were needs and concerns within South Carolina communities.

The Community at-large and County Advisory Committee Members:

Public Forums were planned and implemented for 16 sites throughout the state of South Carolina. The sites covered each of the 6 South Carolina congressional districts in at least two locations. The County Advisory Committee Members were to receive a special invitation to attend one Forum from their local Extension Agent. Community members were asked to attend through flyers placed in local community businesses, churches, and area Extension Offices, through local newspaper ads, and through radio public announcement spots. Of those 56 community members who attended the Public Forum meetings, 96% were African-American, 4% Caucasian, 45% male and 55% female.

The community identified Children & Youth, Education, Housing (Living and Working Environment), Community Leadership and Development, Access to Information, Economic Development, Land Ownership & Other Agricultural Issues, Health & Nutrition, Transportation and Job Skills as the top ten needs and concerns of South Carolina citizens.

A second source of community stakeholder input considered were the results of a dissertation by a South Carolina State University doctoral student, Dr. Geraldine Dukes. Over 1900 persons from traditional and non-traditional audiences were surveyed to identify the most important community concerns for the 21st Century. Results indicated that the important issues facing South Carolinians in the 21st Century were population growth, environmental concerns, community and economic development, agricultural productivity, family issues, and education.

Extension Administrators, Agents, and staff

Forty-seven Extension Administrators, Agents, and staff participated in the community needs and concerns input session. Ninety Six Percent of those participating were African-American, 4% Caucasian and 70% were female and 30% male.

The Extension Administrators, Agents, and staff identified Children & Youth, Housing (Living & Work Environment), Education, Health & Nutrition, Job Skills, Land Ownership & Agricultural Issues, Transportation, Finances, Economic Development and Community Leadership and Development as their top ten issues and concerns for South Carolinians.

Stakeholder Summary Results

When data were aggregated (combining the community results with the Extension Administrators, Agents, and staff results), the top ten issues for South Carolinians in the 21st Century were: Children and Youth, Housing (Living & Work Environment), Education, Health & Nutrition, Community Leadership and Development, Economic Development, Land Ownership and Agricultural Issues, Access to Information, Job Skills, and Transportation.

Environmental Scan

An environmental scan was completed prior to Staff training and Public Forums. The environmental scan seems to verify the identification of significant issues identified by the community. The environmental scan noted the following developmental trends:

Population growth and shifting demographics will continue to cause structural changes between urban and rural areas. As such, rural areas will become more urbanized and their needs will become more urban based. The diversity of population shift will create multi-cultural challenges and more demand for collaborating, networking, and partnering. Clientele-base will be come more diversified, with special needs.

Industrial growth and development will continue to expand the rural-urban mix. As such, emphasis on education preparedness will increase, as more employment opportunities are made available. Workforce preparation will become more critical and opportunities for a skilled labor force will be more and more in demand. Rural infrastructure will change measurably and the use of land other than agriculture will continue to increase.

Economic stability or sustainability will continue to be the major focus of South Carolina leaders and policy makers. How well they address or capture this issue will depend largely on the competitiveness of South Carolina in today's global market economy; and also, on the success of building the economic infrastructure of all counties within the state, having regional and global market potential.

Education preparedness and skill training to meet the labor demands of business and industry will continue to be a major focus of educational development in South Carolina. The state's emphasis on education from Pre-K to 12th grade, and the desire to increase South Carolina's ranking in education nationwide, bear witness to these issues' importance to the state.

Family structure and youth development will continue to show problems across South Carolina. In 1996, more than one-third of the children born in South Carolina were born to single mothers, and in rural areas that figure was as high as 72 percent. School achievement data reveal that South Carolina children are not doing well when compared to the national average. In rural areas, school achievement tests and four-year high school graduation rates generally fell below the state average of 73 percent. Also, children in those areas were more likely to be underweight at birth and mothers were less likely to get adequate prenatal care during the first three months of pregnancy. Moreover, while the ratio of youth referred for criminal prosecution was lower in rural areas, the crimes tended to be more serious than in urban areas. Overall, rural counties were worse off than the rest of the state in all areas except drug and alcohol use.

Consumer demand for quality and safety of the food supply will continue to increase. Concerns relative to pesticide residues, biotechnology implications regarding the altering of food supplies, to the transmission of disease from animals to humans will remain a critical focus.

Focus on service agencies' accountability will continue to be increased. Customers, stakeholders, leaders, and decision-makers' involvement in planning service delivery will be required to plan together to meet needs which will call for stronger collaborations and new types of public-private partnerships.

From these sources of data, the Projected Program Focus Areas and their accompanying activities were identified for the South Carolina State University 1890 Research and Cooperative Extension Plan of Work.

3. Program Review Process

Merit Review

The AREERA Act of 1998 specifies that land grant universities establish a process for merit review of program initiatives. The composition and organization of the South Carolina Merit Review Committee which will be put in place in the 2004 Federal Fiscal year is presented below:

- 2 members from the industry sector
- 2 members representing state and local government
- 1 member from organizations representing the public interest
- 1 member from the service sector
- 1 member from organizations representing underserved populations
- 1 member from community advisory organizations

8 members

The committee chair will rotate each year between the Director of Research and Extension at Clemson, and the Director of Research and Extension, South Carolina State University. The director not serving as committee chair will serve as an ex-officio member.

Initial appointments to the committee will be divided equally between 1, 2 and 3 year terms. Thereafter, terms will be for 3 years.

Programs to be reviewed will be sent by mail or e-mail to the members. The mailing will include a description of the new program to be considered along with a set of questions to be addressed regarding the program. The results will be returned to the chair and the results will be tabulated and the results shared with the membership and others. This facilitates sending new proposals out anytime during the year, and significantly reduces costs and time commitments by the directors and staff.

Three evaluation criteria will be used by the Merit Committee to perform a merit review of programs; relevance, capacity and impact.

Relevance refers to the appropriateness/applicability of program initiatives to address critical issues facing South Carolina.

Capacity is the ability of faculty and staff to develop, implement and evaluate program initiatives.

Impact refers to the effectiveness of program initiatives in accomplishing the established goals.

Relevance will be rated at 40%, capacity at 40% and impact at 20% in each program initiative review.

A. 1862 Extension Program Initiative Review

Three evaluation criteria are being used to establish the merit review process for extension program initiatives. These include relevance, capacity, and impact. Relevance refers to the appropriateness/applicability of programs to address the critical issues facing South Carolina. It examines the project's consistency with university and unit mission, the needs of the stakeholders, and the appropriateness of expertise, methodology, and resources. Capacity is the ability of extension professionals to develop, implement, and evaluate extension programs. Impact refers to the effectiveness of extension programs in accomplishing the goals. Each initiative/project was assessed against these three criteria. A brief description of each of the criteria and the corresponding weight given to each in the total merit review process is given below:

Relevance (40%)

- Does the project demonstrate sensitivity to diverse audiences and interests?
- Does the project recognize the relevance of ethical standards?
- Does the project use an appropriate methodology and evaluation plan?
- What plan is in place to determine if the project should continue?
- If goals are accomplished, will there be a significant consequence or impact?
Will value be added?
- Is this an innovative extension program initiative dealing with critical issues and concerns facing South Carolina, region and nation?
- Have stakeholders and other groups identified this program initiative as being important to the state?
- Are program initiative components based on recent, up-to-date research-based information?
- Does the program initiative address the strategic goals of Clemson PSA?
- What are other states or land-grant universities doing relative to this extension program initiative?
- Is this extension program initiative unique to Clemson University or South Carolina?
- Does the program initiative have stakeholder input?

Capacity (40%)

- Is there sufficient expertise specialists, agents, external sources to implement the program initiative?
- Are facilities in terms of space, equipment, and other resources available?
- Are there enough educational materials available?
- Is the curriculum for the existing program initiative available or should a new curriculum be developed, or can curricula from other states be used?
- Are there resources, both human and financial, to assess program initiative outcomes and impact?
- Is there support and commitment from administrative and other stakeholders?
- Is there sufficient staff support (clerical, technical, and other) available for this program initiative?

Impact (20%)

- Will the program initiative bring about desirable behavior changes in the participants?
- Will the program initiative increase participant's knowledge, skills, attitudes, and aspirations to bring about practice change?

- What economic, social and other impacts will the program initiative have on the participants?
- Are people better off as a result of participating in Extension programs?
- Will society use the program initiatives to address critical issues facing individuals and communities?
- Do program initiative results help bring about policy changes?

1862 Extension Evaluation Framework

A three-prong evaluation framework has been designed to assess the effectiveness and impact of 1862 Extension programs (Figure 1). The three components of this framework are: 1) Clemson University Management Information System (CUMIS), 2) Customer Satisfaction Surveys (CSS), and 3) Generic Evaluation Instrument (GEI). This evaluation framework is being used for all Extension programs included in the POW. A brief discussion of each of the components is presented in the following paragraphs.

Component 1: CUMIS

The Clemson University Management Information System (CUMIS) is a web based reporting system. Any individual who has 20% or more Extension appointment will report his/her activities to the system. As indicated earlier, Extension programs are focused around the five strategic goals of PSA. Within these goals, there are initiatives that address broad issues related to the goals. Within initiatives, there are projects, which addresses specific issues respective to each initiative. The new POW has 15 initiatives and 63 projects under five goals of PSA and GPRA.

The CUMIS system provides data relative to time spent, contacts made by gender, race and limited resource, number of programs/activities conducted, number completing programs, number increasing knowledge, number adopting practices and six other indicators specific to each project. In addition, narrative stories are also included.

Component 2: Customer Satisfaction Surveys

A customer satisfaction survey (CSS) has been developed and is being used to assess the quality of services provided by Extension staff in the 46 counties of the state. Specifically, it measures customer's satisfaction with information obtained from calling or visiting the Extension office. The goal of CSS is to help county staff find ways to improve program quality, information delivery, and more important, to assist in the accountability process.

Each county will randomly select 30 individuals who have received Extension services or information. For purposes of accuracy and ease, two categories of participation were identified. These include: 1) office visits and 2) planned programs. Once the 30 individuals are identified, a team of agents/staff will call these 30 individuals and collect data relative to the four indicators --1) up-to-date, useful, relevant and easy to understand information, 2) the extent to which recipients had the opportunity to use the information, 3) the extent to which they have shared the information with others, and 4) the extent to which they are satisfied with the services provided by Extension.

Component 3: Generic Evaluation Instrument

A generic evaluation instrument (GEI) has been developed to collect information to assess impact of select Extension educational programs on individuals who had participated in Extension programs in all

the 46 counties. Impact will be assessed through: 1) knowledge gained, 2) behavior change, 3) adoption of practice, and 4) economic gain through generation of income or savings as a result of participation and using Extension information and services. Bennett's hierarchy of Extension programming will be used as a guideline to assess program impact. Two programs/projects in each of the five PSA goals will be randomly selected for each county. In all, 460 (2x5x46) programs/projects will be selected for gathering information on GEI. Once the selection of programs/projects is completed, a list of participants in those programs/projects will be identified. Then, a random sample (depending on total number of participants) of participants will be selected. The GEI will be administered via telephone. Data thus collected will be analyzed to assess impact. Data from CSS and CUMIS reports will also be used to assess impact.

B. 1862 Research Program Review

1. Development and Flow of Program Initiatives:

Research program initiatives are designed in a cooperative effort by numbers of faculty (from multiple colleges if appropriate) when a need for research in the state requires multi-disciplinary expertise, interdepartmental resources and sometimes input and technical assistance from across the region or nation. Program Initiatives must be focused in one of the five PSA goal areas. Faculty may develop program areas of research and form program teams based on their current or proposed research projects. Program initiative team members may purchase the time of other faculty on a contractual (consultant) basis using their allotted project funds to assist in the conduct of the program.

Program initiatives are developed by faculty, working with their department chair(s) with guidance and advice from their respective Associate Dean(s) and the Dean and Director, Public Service Research.

Once program initiatives have been approved by the Associate Dean(s) they will be scheduled for presentation to the Merit Committee. Presentations will consist of an advance package of materials on the program initiative mailed at least 30 days before the meeting and an oral presentation to the Merit Committee by the faculty member(s).

Program initiatives recommended for approval will be forwarded to the Associate Dean(s) for review as required, submission to USDA, funding assignments, and implementation. Program initiatives not recommended for approval will be returned to the faculty with comments for further action.

Time Line:

May	New program initiative concepts presented to the Merit Assessment Committee. Faculty are notified of projects/program initiatives terminating on June 30 of the Following year. (13 months advance notice)
June	Program initiative concepts approved/disapproved by the Director of the Experiment Station.
June-August	The Director, Department Chairs, Associate Deans and faculty meet to discuss potential program initiative participation and project design. They must:

-Specify program initiative area(s)

- Present case for relevance, capacity and impact
- Detail research/extension collaboration, as appropriate
- Set costs associated with the project.

November	New projects approved by the Director are sent out for peer review.
January	Peer reviewed projects sent to USDA for approval.
January-	Program funding and project based funding to units negotiated with February Associate Deans and department chairs.
March	Budgeting Process complete for next state fiscal year.
July	Program initiative/project begins

3. The Merit Committee will use the following evaluation criteria to review each program plan which has been submitted:

A. Relevance (40%)

- Is this a truly innovative approach to dealing with a critical problem facing South Carolina, the region, and nation?
- Is this an important concern such that the research addresses a regulatory, political and social issue that requires timely response and attention?
- Have stakeholders (advisory boards, etc.) and the public identified this area as being important to the state, regional, national, and international levels?
- Does the program initiative mesh with the adopted goals of Clemson PSA?
- Does this program initiative respond to a major administrative or legislative emphasis?
- Is this program initiative area widely supported at other land grant universities, government agencies and in the private sector?
- Is it a specialized activity found only at Clemson University?

B. Capacity (40%)

- Are there sufficient internal funds to support this program initiative?
- Are there any external funds available to use as leverage for support?
- Are facilities available for this activity?
- Are facilities adequate for support of program initiative?

- Do existing facilities need to be renovated?
- Are new facilities required in order to conduct activities?
- Does research require specialized facilities?
- Has the correct expertise been identified to accomplish the program initiative?
- Does/Do the investigator(s) have a proven track record in this area? (A current C.V. documenting expertise of each participating investigator should be submitted and attached to the program initiative proposal.)
- Is there sufficient staff support (clerical, technical, other) for this program initiative?
- Is this the right time to propose this work and support it? Is the program initiative area “too risky”?
- Is there administrative commitment to this program initiative area?

C. Impact (20%) (The scope of the impact should be considered from the state to the international level)

- What is the scientific merit of this proposed research? Will it result in new findings that will be widely accepted by the scientific community?
- Does this work reduce or eliminate major costs?
- Will there be a major impact on economic growth as a result of this work?
- Will society benefit greatly from this work? Will the condition of the human race be improved as a result of these research endeavors?
- Will the results and findings of this work help to set policy in the agriculture arena?
- Should we invest in this area at all? Can we afford to make an investment in this area? Are the costs too high relative to the expected outcomes?
- What chance does this program initiative have at succeeding?

C. 1890 Research Peer Review System

The Peer Review Committee at South Carolina State University is composed of four subcommittees representative of the four research problem areas to which the 1890 Evans-Allen Research Program is committed. A five-member panel make up each subcommittee with the 1890 Senior Associate Research Director holding the position of chairperson for each subcommittee. The subcommittees, with the assistance of other peer professionals, evaluate project proposals, which are developed for funding consideration departmentally from academic areas of the university.

Upon receipt of a project proposal to the Senior Associate Research Director, the project proposal is submitted to the Director of 1890 Research and Cooperative Extension, the Assistant Administrator, and the Evaluation Specialist who reviews the relationship of the proposed project to the needs of Extension. Once approved by the Director, Assistant Administrator, and the Evaluation Specialist, the project is submitted to the appropriate Peer Review Subcommittee for review. After the subcommittee reviews the merits of a Project proposal, its findings are submitted to the Senior Associate Research Director who, then, communicates with the proposal writer at the Department level as to the findings of the review, and further action.

If the subcommittee recommends approval of a proposal, the Senior Associate Research Director will then submit the project proposal to the 1890 Research Director for further review through the State Experiment Station. After the State Experiment Station Review, the 1890 Research Director then reviews the proposal status for preparation and submission to Cooperative State Research, Education and Extension Service (CSREES), USDA for final review and official approval. If approved by CSREES, USDA, then authorization is given to the 1890 Research Director to fund the proposal, if Evans-Allen funds are available at the station level to do so.

A further description of the Peer Review Process:

- The project proposals are reviewed by the Director of 1890 Research and Cooperative Extension, the Assistant Administrator, and the Evaluation Specialist for the projects correlation with the needs of Extension.
- Four Peer Review Subcommittees are appointed by the President of the University corresponding to the four Research Program areas to which the 1890 Research Program is committed.
- The project proposals are reviewed by competent peer scientists in related and non-related disciplines. Subcommittee members, if deemed necessary, may seek consultation from competent authorities/peer scientists at other institutions or agencies.
- Members of each subcommittee are provided copies of the Peer Review Process.
- A critical evaluation sheet is attached to all project proposals for subcommittee members' use in responding to the merits of the project proposals which corresponds to the "Essentials of a Project Outline" as set by federal regulations and guidelines.
- All project proposals are evaluated for scientific approach, experimental design, overall scientific quality, and contribution to the mission of CSREES and the university's land grant mission.
- Project proposals are evaluated to establish relevance of proposed research to: (a) State, regional and/or national needs (b) On-going research in the problem area – both statewide/or regional.
- The applicant or proposal writer is given suggestions as to any possible need for cooperation with other scientists and research units within and outside of the University.
- The Subcommittee Peer Review Chairperson may request applicants or proposal writers to supply additional information and make adjustments in project outlines or proposals where deemed appropriate.
- The Subcommittee Peer Review Chairperson may request applicants or proposal writers to supply additional information and made adjustments in project outlines or proposals where deemed appropriate.

- The 1890 Research Director of the Evans-Allen Research Program will provide assurance to CSREES, USDA that an approved review process has been followed and the proposed project submitted has been recommended for approval through the approved Peer Review System as stated above.

4. Multi-State Research and Extension Initiatives

A. 1862 Research (Hatch Multi-state)

The Experiment Station invests in excess of \$1,338,000 each year of Hatch funds and matching funds in multi-state initiatives. For Federal Fiscal Year 2003 \$1,900,311 in state matching funds will complement \$669,419 in Hatch Regional Funds in support of multi-state initiatives.

The following Hatch Multi-state Research initiatives are underway. They are presented by program initiative areas:

1. Plant-based agriculture and industries (National Goals 1 & 4)

S-302	\$131,741	A. Keinath	Sept 2005	Biological control of soil-borne Plant pathogens for sustainable agriculture
NC-142	\$66,404	B. Moore	Sept 2007	Regulation of Photosynthesis Processes
NC-140	\$188,684	G. Reighard	Sept 2007	Rootstock and Interstem Effects On Pome and Stone Fruit Trees
S-9	\$159,986	E. Shipe	Sept 2007	Plant genetic resources conservation and Utilization
NE-1006	\$ 6,947	S. Scott	Sept 2006	Eradication, Containment and/or Management of Plum Pox Disease (Sharka)
<u>Sub Total</u>	<u>\$553,942</u>			

2. Animal-based agriculture industries (National Goal 1)

S-291	\$36,370	H. Allen	Sept 2004	Systems for controlling air Pollutant emissions and indoor environments of poultry, swine & dairy facilities
W-181	\$326,302	T. Jenkins	Sept 2004	Modifying Milk Fat

Composition For Enhanced Manufacturing Qualities and Consumer Acceptability

S-277	\$214,738	Meadows	Sept 2007	Breeding to optimize maternal performance and reproduction of beef cows in the Southern region
S-289	\$298,698	D. Maurice	Sept 2004	Factors associated with genetic and phenotypic variation in poultry: molecular to populational.
NE-060	\$ 89,851	T. Scott	Sept 2003	Genetic Bases for Resistance and Immunity to Avian Diseases
<u>Sub Total</u>	<u>\$974,303</u>			

3. Agrisystems management and profitability (National Goals 1 & 5)

There are no regional research initiatives in this program initiative area

4. Horticulture and home-based plant health management (National Goal 1)

There are no regional research initiatives in this program initiative area

5. Pest control and management (National Goals 1& 4)

S-301	\$6,947	G. Carner	Sept 2005	Evaluation and safety of entomopathogens for control of arthropod pests
S-282	\$128,700	S. Lewis	Sept 2003	Managing plant-parasitic Nematodes in sustainable agriculture with emphasis on crop resistance
S-303	\$272,221	G. McCutcheon	Sept 2005	Biological Control of arthropod pests and weeds
<u>Sub Total</u>	<u>\$407,868</u>			

6. Food safety and quality (National Goals 1, 2 & 3)

S-295	\$42,769	P. Dawson	Sept 2005	Enhancing food safety through control Of food-borne disease agents
S-292	\$44,261	P. Dawson	Sept 2004	The Poultry Food System: A farm to table model
<u>Sub Total</u>	<u>\$87,040</u>			

7. Food, nutrition and health (National Goals 3)

There are no regional research initiatives in this program initiative area

8. Natural resources and the environment (National Goal 4)

S-1000	\$64,867	D. Brune	Sept 2006	Animal Manure and waste utilization,treatment and nuisance avoidance for a sustainable agriculture.
S-1004	\$82,485	J. Hayes	Sept 2006	Development and evaluation Of TMDL planning and assessment tools and processes.
S-271	\$39,110	M. Riley	Sept 2007	Solid-phase extraction techniques for pesticides in water samples.
S-280	\$83,375	B. Smith	Sept 2003	Mineralogical controls on colloid dispersion and solid-phase speciation of soil contaminants
<u>Subtotal</u>	<u>\$269,837</u>			

9. Community and economic growth, leadership and volunteer development, public policy and social issues (National Goal 5)

NE-1011	\$86,787	D. Barkley	Sept 2007	Rural Communities, rural labor markets and public policy
S-1007	\$64,867	D. Bruney	Sept 2007	The science and engineering for a biobased industry and economy
S-296	\$122,431	M. Henry	Sept 2005	Rural labor markets: workers,

firms and communities in transition

Sub Total \$274,085

10. 4-H, youth development (National Goal 5)

There are no regional research initiatives in this program initiative area

11. Family strengths (National Goal 5)

S-298	\$22,369	J. Marsh	Sept 2005	Assessing impacts of welfare reform on individual, family and community well being in the rural South
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Sub Total \$22,369

12. Technology, innovation, and communication (National Goals 1,2,3,4 & 5)

S-65	\$25,000	S. Barefoot	Sept 2029	Multistate research coordination, Southern Region
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Sub Total \$25,000

Total Support for Regional Research Initiatives: \$2,569,730

\$ 669,419 Hatch Regional Research Funds
\$1,900,311 State Matching Funds

B. 1862 Extension Multi-state

Extension faculty and staff will be involved in a wide range of Multi-state initiatives. Specific examples include following:

1. Virtual Small Fruit Center
2. Regional Forestry Position
3. Regional Water Quality Position (EPA)
4. Orchard Floor Management
5. Food Safety Education

In the following paragraphs, the purpose/goals, cooperating states, and financial commitment for each of the initiatives is presented.

1. Virtual Small Fruit Center

Purpose and Goals: The purpose is to foster interdepartmental, interdisciplinary and inter-campus communication and collaboration related to small fruit crops in the south eastern region, and to create more visible and active focal point for stakeholders within and outside the university for research, extension and outreach activities related to small fruit production, handling, processing, marketing and consumption.

Cooperating States: Clemson University, SC
North Carolina State University, NC
University of Georgia, GA

Financial Commitment: FTEs - 0.3; 33.3% of the total budget (\$104,091)

2. Regional Forestry Position

Purpose and Goals: To increase coordination and expansion of forestry educational programs in the region through sharing skills, expertise and resources of the cooperating organizations by establishing a Regional Extension Forester position.

Cooperating States: Alabama Kentucky North Carolina Tennessee
Arkansas Louisiana Oklahoma Texas
Florida Mississippi South Carolina Virginia

Financial Commitment: FTEs - .08; \$4,500 for each participating state

3. Regional Water Quality Position

Purpose and Goals: To strengthen coordination and cooperation among EPA, state environmental agencies, USDA-CSREES, Cooperative Extension in the eight states in the region. In addition, it will identify and provide related extension educational materials to EPA and others as appropriate and communicate research, and other education needs of extension audiences to EPA and other appropriate organizations.

Cooperating States: Alabama Florida Georgia Kentucky
Mississippi North Carolina South Carolina Tennessee

Financial Commitment: FTEs - 0.12; \$4,750

4. Orchard Floor Management

Purpose and Goals: To provide overall direction and leadership in orchard and vineyard floor management in North Carolina, South Carolina, and Georgia. Specific goals include:
1) evaluating orchard and vineyard floor management programs, 2) provide support to county extension faculty by writing appropriate extension publications, participating in field days, on-farm demonstrations, and in service training.

Cooperating States: North Carolina, South Carolina, and Georgia

Financial Management: 1/3 FTEs and a yearly budget of \$14,000 for each state. The combined total is 1.00 FTE and \$42,000.

5. Title: Food Safety Education

Purpose: To validate existing food safety educational resources.

Cooperating States: University of Georgia, North Carolina State, Clemson University
Financial Commitment: \$30,000 annually

C. 1890 Multi-State Research and Extension Activities

FFNEWS: Families First: Nutrition Education and Wellness System (FFNEWS) is a nutrition education intervention program designed to help families select and prepare meals consistent with their cultural traditions while improving their overall health. Upon completion of the program, participants are able to make rational food choices from a variety of foods, improve their diet through a wide selection of food and food supplements, improve the nutritional status of the family by better utilizing foods commonly available in traditional recipes, practice food safety measures in handling foods during meal preparation and service and practice safe and nutritious home gardening and food preservation skills. The target audience are primary food stamp recipients and secondary at-risk youths in summer camp.

FFNEWS is conducted by a multi-state consortium of 1890 Cooperative Extension Programs at: Langston University (Oklahoma), Prairie View A&M University (Texas), South Carolina State University (South Carolina), Southern University and A&M College (Louisiana), University of Arkansas at Pine Bluff (Arkansas) and Lincoln University (Missouri).

Greater Minority Participant Program: The Greater Minority Participant Program is an effort to improve diverse youths' participation in 4-H activities. The Greater Minority Participant Program is sponsored by the Association of Extension Administrators and South Carolina State University 1890 Cooperative Extension. To increase all racial and ethnic participation in 4-H at the local, state and national levels, the program will foster meaningful collaboration among the traditional partners (CSREES, National 4-H Council, land grant institutions), new youth development organizations and organizations with racial/ethnic minority clientele.

In addition to South Carolina State University (South Carolina), there are 14 other institutions in 13 states participating in the program. They are: Florida A&M University (Florida), University of Maryland Eastern Shore (Maryland), Alabama A&M University (Alabama), Alcorn State University (Mississippi), Southern University (Louisiana), Kentucky State University (Kentucky), Tuskegee University (Alabama), University of Arkansas at Pine Bluff (Arkansas), Langston University (Missouri), Virginia State University (Virginia), North Carolina A&T University (North Carolina), Fort Valley State University (Georgia), Delaware State University (Delaware) and Prairie View A&M University (Texas).

5. Integrated Research and Extension Activities

A. As required by the AREERA Act of 1998, the Experiment Station and the Cooperative Extension Service at Clemson University have integrated their efforts to foster knowledge development and transfer for the citizens of South Carolina. The process of involving the integration of research and Extension efforts are as follows:

A critical element for successful integration efforts is the joint appointment of faculty in both research and Extension. The Research and Extension integrated activities are presented below by program area.

		RESEARCH	EXTENSION
	Project #	Funding	Funding
Turfgrass			
Camberado	1700211	\$51,595	\$21,989
Hale	1700212	14,000	52,920
McCarty	1700163	47,728	20,046
Fruit Crops			
Schnabel	1700159	\$24,008	\$45,376
Field Crops			
Norsworthy	1700160	\$57,531	\$19,155
Chapin	1700191	24,489	73,949
Frederick	1700140	\$51,742	22,022
Jones, M.A.	1700142	8,846	59,953
Mueller	1700182	73,402	18,498
Pest Management			
Zungoli	1700230		\$25,123
Morse	1700178	\$32,428	\$29,366
Benson	1700203	\$31,144	65,702
Hood	1700235		42,648
Totals		\$416,913	\$496,747
		\$395,376 (Research Target in The USDA POW)	\$460,123 (Extension Target in The USDA POW)

B. As community problems and concerns are identified, they are defined by 1890 Extension, research is conducted and feedback is provided to the community through Extension. Higher Education has a critical supporting role in this integrated model.

Societal Problems are identified by Stakeholder Input which is then defined by Extension and studied by Research. Research returns resultant information back to Extension which develops programs, gets Stakeholder Input (Merit Review), and delivers the program back to the community. Higher Education is a partner in this process by gathering data to help identify problems, to help with the identification of the problem by posing hypotheses and then conducting research through multi-disciplinary/multi-institutional/multi-state/region collaborations. After the research has been conducted, Higher Education disseminates results through presentations and publications and delivers those results through academic course offerings.

Civil Rights

Equal Opportunity Employment:

We will maintain highly visible practices in compliance with Civil Rights laws, rules and regulations. Recruitment efforts will be designed to attract qualified under-represented individuals to 1890 Research and Cooperative Extension at South Carolina State University. Also, efforts will be made to promote from within the organization qualified individuals representing under utilized and/or under represented populations. The complaint procedure has been reviewed, updated and issued to all employees.

Goal 1: An equal employment opportunity/affirmative action component will be incorporated into each employee's position description and all employees will be evaluated on EEO/AA through our employee performance management system.

Indicator: Number of position descriptions updated to include EEO/AA component.

Goal 2: All reasonable efforts will be expended to enhance opportunities for under utilized and under represented employees of all races, color, sex, national origin, religion, age and/or physically challenged groups.

Indicators: 1) Number of women promoted within the Cooperative Extension Program.
2) Number of non-Black applicants who are hired.
3) Number of non-Black and female employees included in administrative decisions and workshop seminars.

Program Delivery:

Based on 1990 census data, there are 3,486,703 people in South Carolina. Sixty-nine percent are white and 31 percent are black. There are 512,339 potential recipients (low-income individuals). Thirty-nine percent are white and 61 percent are black. There are 67,632 single households with children under 18 years of age living with incomes below the poverty level. There are 111,173 families living below the poverty level. Thirteen percent of children live in extreme poverty. In agriculture, there are 133,555 small farmers and approximately 55% are black.

We will focus efforts on identifying and documenting potential audiences and monitoring of program delivery to participation of targeted audiences by Extension supervisors.

Goal 1: Identify potential recipients of Extension programs.

Indicator: Document potential recipients in all assigned counties.

Goal 2: Supervisors will use reporting system data to monitor work across racial lines.

Indicators: 1) Number of personal contacts with minorities documented in the files.
2) Number of Civil Rights success stories turned in to Civil Rights coordinator.

(Civil Rights Program Delivery continued)

Goal 3: Committees will be balanced to be representative of potential recipients.

Indicators: 1) Number of committees which are representative of potential recipients.
2) Number of under represented groups serving on committees.

Public Notification:

All reasonable efforts will be made to notify the public of Extension programs and activities. We will ensure that Extension facilities are accessible. All organizations using Extension facilities will be made aware of the nondiscrimination policy. We will openly display nondiscrimination policy signs in all Extension facilities and publicize the nondiscrimination policy in all Extension program announcements, print materials and media releases. The affirmative action plan will be discussed during an in-service training session annually.

Goal 1: To use aggressive affirmative action procedures to ensure nondiscrimination throughout the organization.

Indicators: 1) Number of office facilities accessible to the physically challenged.
2) Number of Civil Rights compliance forms signed.
3) Number of facilities displaying the "...and justice for all" poster in office and conference rooms.
4) Number of newspaper articles and brochures which include the nondiscrimination statement.

Civil Rights Training:

Civil Rights is a part of all orientation training for new employees and all employees will receive the EEO complaint brochure. Supervisors hold regular staff meetings and Civil Rights is discussed at least once per month. Civil Rights is always included in staff retreats which are attended by all.

Goal 1: To train Research and Cooperative Extension staff on all aspects of Civil Rights.

Indicators: 1) Number of new employees participating in Civil Rights training.

2) Number of employees who receive the EEO complaint brochure.

On-site Compliance Reviews:

We will continue to hold county compliance reviews in cooperation with 1862 Extension.

Goal 1: To conduct on-site Civil Rights compliance reviews.

Indicator: 1) Number of 1890 counties reviewed over the five year Plan of Work cycle.

Response to Work Load (FTE) concern:

The FTEs presented in the South Carolina State 1999-2004 Plan of Work for each Focus Area are best estimates of funded human resources. Specific reference to Focus Area 451 (Natural Resources and the Environment) under Goal 4: Greater harmony between agriculture and the environment will include support from the South Carolina Department of Natural Resource which has committed to assist South Carolina State University's 1890 Cooperative Extension Program in the development of water quality education programs. In addition, the South Carolina Department of Health and Environmental Control (DHEC) has agreed to assist this program effort in the development of water quality information.

Finally, in addition to identifying and utilizing volunteers for many Focus Areas, funds are being sought for support through student internships.