

V(A). Planned Program (Summary)

Program # 12

1. Name of the Planned Program

Global Food Security and Hunger

Reporting on this Program

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants	10%	5%	0%	20%
204	Plant Product Quality and Utility (Preharvest)	10%	15%	20%	10%
205	Plant Management Systems	15%	20%	10%	10%
212	Pathogens and Nematodes Affecting Plants	25%	10%	10%	10%
213	Weeds Affecting Plants	10%	15%	20%	0%
216	Integrated Pest Management Systems	20%	10%	0%	10%
301	Reproductive Performance of Animals	0%	0%	0%	10%
302	Nutrient Utilization in Animals	0%	0%	0%	5%
303	Genetic Improvement of Animals	0%	0%	0%	5%
304	Animal Genome	0%	0%	10%	0%
307	Animal Management Systems	0%	5%	0%	5%
311	Animal Diseases	0%	0%	10%	0%
315	Animal Welfare/Well-Being and Protection	0%	10%	0%	0%
601	Economics of Agricultural Production and Farm Management	5%	10%	0%	10%
701	Nutrient Composition of Food	5%	0%	20%	5%
	Total	100%	100%	100%	100%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2013	Extension		Research	
	1862	1890	1862	1890
Plan	45.0	3.0	16.3	2.0
Actual Paid Professional	35.0	8.0	4.8	2.0
Actual Volunteer	0.0	0.0	0.0	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
1428194	301275	681428	263095
1862 Matching	1890 Matching	1862 Matching	1890 Matching
1428194	249254	836516	206424
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Research was conducted on micropropagation mediums, parasitic plant nematodes, new forage crops for the state, new peach variety development, management strategies for insect pests of cotton and soybeans, precision agriculture, grafting methods and disease management for watermelons.

In addition, scientists worked on agronomic practices for cotton production, the use of sensors for site specific applications of pesticides, fertilizers and water, weed management practices in corn, soybeans and cotton, and dealt with minimizing losses caused by nematodes in a variety of crops.

Research was implemented on the automatic identification technology usage for farm produce traceability. The traceability equipment was implemented into the supply chain for the selected businesses. Training was provided for proper use of the equipment. Data collection was conducted on seasonal crops. Data was collected from small scale farms of summer crops. The process was conducted for determining the necessary requirements and feasibility for integrating the RFID (Radio Frequency identification) system used in the project with the inventory systems used by selected Orangeburg County medium scale farm participation distribution centers.

In focusing on research dealing with the impact of the Panama Canal expansion on corn exports, the research developed the basic OLS (Ordinary Least Square) and time series models to predict regional corn exports. Relevant data from various resources to run the regression models were collected and comparisons were made. A transportation model to forecast corn exports by several major ports was built.

Paper presentations and articles were written and presented at conferences, symposiums, etc. Publications were submitted to peer reviewed journals.

Educational programs and activities were conducted that focused on integrated crop management, integrated pest management, water resources, risk management, and marketing. Field trials were conducted and demonstrated.

2. Brief description of the target audience

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

The target audience includes producers, limited-resource farmers and Extension personnel, agency

personnel.

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2013	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	28485	15226	259	242

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

Patent Applications Submitted

Year: 2013

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2013	Extension	Research	Total
Actual	0	28	28

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Disclosures

Year	Actual
2013	2

Output #2

Output Measure

- Licenses

Year	Actual
2013	0

Output #3

Output Measure

- Number of people completing educational workshops

Year	Actual
2013	12221

Output #4

Output Measure

- New Variety Releases

Year	Actual
2013	0

Output #5

Output Measure

- Number of youth participating in 4-H food systems programs

Year	Actual
2013	932

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of people reporting increased knowledge
2	Number of acres affected by Integrated Crop Management or Integrated Pest Management programs.
3	Number of youth gaining knowledge of food systems
4	Number of producers indicating adoption of recommended agronomic crop production practices
5	Number of producers indicating adoption of recommended animal production practices
6	Number of acres affected by Integrated Crop Management.

Outcome #1

1. Outcome Measures

Number of people reporting increased knowledge

2. Associated Institution Types

- 1890 Extension
- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	1661

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

South Carolina Low Country counties find vegetable production to be a profitable enterprise. The long planting season allows for spring and fall crops, which is more appealing. Increasingly higher production cost has caused problems for limited resource producers. Sustainable agriculture practices and skills learned in their application have shown a reduction in production costs for some producers. Vegetable producers and gardeners are interested in up-to-date production practices and techniques, specifically sustainable practices to sustain their operations. There are higher production costs, especially costs of chemical applications. In order to maintain their operations, they must increase their skills in sustainable agriculture practices.

What has been done

Small, limited resource vegetable producers were organized in an Integrated Pest Management (IPM) Project. The project focused on small farm sustainability, updated production practices, soil fertility and pest management practices. Skills training were provided in sustainable agriculture practices through production meetings, field demonstrations and tours, training sessions and workshops.

Results

Fifty nine (59) small vegetable producers and gardeners received training, gained knowledge and increased skills in the application of sustainable agriculture practices. The updated production practices were adopted by eighty five percent(85%) of project participants. One hundred percent (100%) of participants gained knowledge of the practices, fifty percent (50%) demonstrated improved skills, forty percent (40%) increased production and twenty five percent (25%) reported increased income. As a result of assistance from 1890 Extension, one producer began with the IPM Collard Project four years ago. He has now expanded his crops to included 10 other vegetables and dramatically increased his customer base.

4. Associated Knowledge Areas

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

Outcome #2

1. Outcome Measures

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

2. Associated Institution Types

- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	2047

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Local vegetable producers were interested in producing a high quality product with the least amount of off farm inputs and higher rates of profit. Producers were interested in using fewer chemicals and fertilizers. They wanted to eat healthier as well as purchase locally grown food.

What has been done

Workshops were held emphasizing soil fertility, marketing strategies, healthy eating as well as promoting more chemical free foods. Cultivating soil and weed management were also addressed for higher yields and pest management.

Results

One hundred percent of the IPM participants took soil samples and begun to implement soil fertility management concepts. As a result of the IPM Training Project, farmers have adopted

IPM, soil testing, crop rotation for disease control, reduced herbicide rates for crop rotation and selection of crops best adapted to soil growing conditions. Excessive rains destroyed over 95% of the IPM Project farmers' crops, but they replanted their crops and implemented the IPM recommended practices. Soil testing and crop rotation for disease control saved financial resources by using less herbicides and fertilizers.

4. Associated Knowledge Areas

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

Outcome #3

1. Outcome Measures

Number of youth gaining knowledge of food systems

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

{No Data Entered}

What has been done

{No Data Entered}

Results

{No Data Entered}

4. Associated Knowledge Areas

KA Code	Knowledge Area
701	Nutrient Composition of Food

Outcome #4

1. Outcome Measures

Number of producers indicating adoption of recommended agronomic crop production practices

Not Reporting on this Outcome Measure

Outcome #5

1. Outcome Measures

Number of producers indicating adoption of recommended animal production practices

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
302	Nutrient Utilization in Animals
307	Animal Management Systems
315	Animal Welfare/Well-Being and Protection

Outcome #6

1. Outcome Measures

Number of acres affected by Integrated Crop Management.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2013	518041

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Sustainable agronomic crop production programs will develop and implement agricultural production systems in South Carolina that are economically sustainable, safe and environmentally sound.

What has been done

Clemson Extension conducts Official Variety Trials of all major crops in multiple locations across the state. The information generated from these trials is then used by growers to select the varieties that perform best in their region of the state. Extension conducted 394 programs reaching 12,221 persons; 94% of the participants indicated that they gained knowledge and 57% reported using practices learned. Educational programs included such topics as farm accounting and financial analysis; pesticide applicator training; soybean, tobacco, corn and cotton production meetings; fruit and vegetable meetings; beekeepers meetings; irrigation modeling for orchard crops; organic vegetable disease control.

<http://www.clemson.edu/extension/aes/budgets/index.html>

Results

Extension ICM activities affected 800,000 agronomic crops and 100,000 horticultural crops. Horticultural crop estimates include 35,000 acres of vegetable crops, 25,000 acres of fruit crops, 40,000 acres of sod, with the remainder of nursery/field grown floriculture. Improved strawberry production practices added \$10,725,000 to the South Carolina economy. Labor costs associated with peach thinning were reduced from \$165 to \$93 per acre. A collard crop improvement project reduced the number of insecticide and nitrogen applications for a savings of \$193/acre and of \$114/acre, respectively. South Carolina growers produced a cotton crop valued at \$211,848,000, a soybean crop valued at \$101,700,000, a corn crop valued at \$145,860,000, and a wheat crop valued at \$76,140,000. Peanut production was valued at \$7.5 million for growers and the South

Carolina economy. If yields were increased by 5% through proper variety selection this would result in an additional \$26,777,400 in revenue for South Carolina producers.

4. Associated Knowledge Areas

KA Code	Knowledge Area
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants
205	Plant Management Systems
212	Pathogens and Nematodes Affecting Plants
213	Weeds Affecting Plants
216	Integrated Pest Management Systems
601	Economics of Agricultural Production and Farm Management

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

V(I). Planned Program (Evaluation Studies)

Evaluation Results

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Key Items of Evaluation