

V(A). Planned Program (Summary)

Program # 5

1. Name of the Planned Program

Sustainable Energy

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 |
|---------|---|-----------------|-----------------|----------------|----------------|
| 123 | Management and Sustainability of Forest Resources | | 30% | | 30% |
| 124 | Urban Forestry | | 60% | | 60% |
| 125 | Agroforestry | | 10% | | 10% |
| | Total | | 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 | 0.0 | 3.0 | 0.0 | 5.0 |
| Actual Paid Professional | 0.0 | 1.0 | 0.0 | 3.4 |
| 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 |
| 0 | 50231 | 0 | 143639 |
| 1862 Matching | 1890 Matching | 1862 Matching | 1890 Matching |
| 0 | 50209 | 0 | 130699 |
| 1862 All Other | 1890 All Other | 1862 All Other | 1890 All Other |
| 0 | 0 | 0 | 2000 |

V(D). Planned Program (Activity)

1. Brief description of the Activity

1. Worked with existing organizations to strengthen links between businesses, community based organizations and outreach education.
2. Assisted local farmers and land owners/users to develop alternative enterprise initiatives for rural businesses.
3. Empowered community leaders and residents in the targeted areas to develop strategic plans for optimum utilization of natural resources.
4. Communicated and disseminated research findings to customers through extension personnel in the form of publications, conferences, workshops, field days, home/office visits, demonstrations and other educational resources.
5. Collaborated with local, state and federal agencies, institutions, groups, private organizations /associations in seeking and delivering services to citizens.
6. Encouraged community organizations and resident involvement in developing plans for sustainable energy.
7. Provided community leaders with advice and recommendations regarding best practices in community economic development programs for their communities.

2. Brief description of the target audience

Rural and urban dwellers, under-represented, underserved, socially and economically disadvantaged groups in traditionally agricultural and urban communities in the State will be targeted for the purpose of encouraging and educating them on the need for, and the benefits of sustainable energy.

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 | 1741 | 12420 | 0 | 0 |

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 | 2 | 0 |

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- 1. Number of educational program activities

| Year | Actual |
|-------------|---------------|
| 2013 | 39 |

Output #2

Output Measure

- 2. Number of educational contacts

| Year | Actual |
|-------------|---------------|
| 2013 | 14161 |

Output #3

Output Measure

- 3. Number of published materials distributed

| Year | Actual |
|-------------|---------------|
| 2013 | 2119 |

Output #4

Output Measure

- 4. Number of research & extension outreach publications developed (in-house)

| Year | Actual |
|-------------|---------------|
| 2013 | 4 |

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

| O. No. | OUTCOME NAME |
|--------|---|
| 1 | NATIONAL OUTCOME #5: Increased knowledge & understanding of the biofuels supply chain |
| 2 | NATIONAL OUTCOME #7: Develop a diverse and educated workforce for a biofuels industry |

Outcome #1

1. Outcome Measures

NATIONAL OUTCOME #5: Increased knowledge & understanding of the biofuels supply chain

2. Associated Institution Types

- 1890 Extension
- 1890 Research

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)

Long-term rising costs of transportation fuels, dependence on foreign resources and concern that fossil fuels adversely affect climate have stimulated interest in renewable fuels. Instability and price volatility of oil have caused volatility in the US and World economic climate. There are multiple renewable energy resources (wind, solar, etc.) but, the only viable renewable source of transportation fuels that will not affect food, feed, and fiber production, supported by the government, is plant biomass. Louisiana is rich in natural resources such as forestry and other sources suitable for consideration as bioenergy feedstocks. The climate is also highly adaptable to growth of highly productive to non-food feedstocks which could serve as energy sources such as urban wood wastes and cane biomass. Development of methodologies and technologies for the utilization of such natural resources for the purpose of energy is an important priority for our country's energy-based economy. Additionally, there is need to develop screening strategies to understand trees tolerance to changing environmental conditions and the development of new technologies to improve forest health and resistance to pest.

What has been done

One Evans-Allen research grant was funded to study plant-based mulch products for biophysical management of Oak trees in urban areas of Louisiana. Faculty & staff obtained an externally funded grant to develop biofuels from sustainable alternative non-food feedstocks in Louisiana. A third grant which ended August 2013 studied the application of nanotechnology in forest health management. Some of the goals were to quantify urban forest wood waste biomass; secondly, to process energy cane and various type of urban forest waste biomass with solvents and catalysts into high-quality bio-oil via exposure to electromagnetic fields; and to conduct economic analysis and impact assessment.

The SU Ag Center collaborated with scientists from the LSU AgCenter, USDA-FS, ISA, SAF, Louisiana State University (LSU), Louisiana Department of Environmental Quality (LA DEQ), the

Louisiana Department of Agriculture & Forestry (LA DA&F), the Gulf Coast Cooperative Ecosystem Studies Unit (GC-CESU), and the City of Baton Rouge, LA. in these endeavors. A research symposium and two research seminars and one workshop have been conducted on bioenergy and biofuel production in collaboration with the USDA, LSU, and E-Fuel corporation. A web-based educational bioenergy and biofuel video (Biofuel Research in Louisiana: SU Ag Center) was produced in collaboration with the SU Ag Center and made available on the internet. Two national presentations have been conducted through the Society of American Foresters (SAF) and the International Society of Arboriculture (ISA) conventions.

Results

Five innovative laboratory and field techniques have been developed at SU Agricultural Research and Extension Center (SUAREC-Bioenergy 1-5) to process agricultural and urban vegetative waste to biofuel through the utilization of E-Fuel ethanol production technology at small scale. Several Agricultural feedstocks have been processed for utilization in ethanol production e-fuel technology.

Graduate and undergraduate students from both Southern University and LSU gained useful research knowledge and skills through their involvement in these and other projects. Two Ph.D. students from SU are currently working on the utilization of urban wood waste and agricultural wastes for ethanol production in collaboration with LSU. Findings from these research projects have been publicized in the form of presentations at international, national and regional conferences. The extension agents, research scientists, practitioners, land owners, etc. will continue to benefit from findings of these research projects. Of the 1,741 stakeholders participating in programs on production/harvesting/storage systems, 92 percent increased knowledge; and about 35 percent actually adopted BMPs for production/harvesting/storage systems.

4. Associated Knowledge Areas

| KA Code | Knowledge Area |
|----------------|---|
| 123 | Management and Sustainability of Forest Resources |
| 124 | Urban Forestry |

Outcome #2

1. Outcome Measures

NATIONAL OUTCOME #7: Develop a diverse and educated workforce for a biofuels industry

2. Associated Institution Types

- 1890 Extension
- 1890 Research

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)

Long-term rising costs of transportation fuels, dependence on foreign resources and concern that fossil fuels adversely affect climate have stimulated interest in renewable fuels. Instability and price volatility of oil have caused volatility in the US and World economic climate. There are multiple renewable energy resources (wind, solar, etc.) but, the only viable renewable source of transportation fuels that will not affect food, feed, and fiber production, supported by the government, is plant biomass. Louisiana is rich in natural resources such as forestry and other sources suitable for consideration as bioenergy feedstocks. The climate is also highly adaptable to growth of highly productive to non-food feedstocks which could serve as energy sources such as urban wood wastes and cane biomass. Development of methodologies and technologies for the utilization of such natural resources for the purpose of energy is an important priority for our country's energy-based economy. Additionally, there is need to develop screening strategies to understand trees tolerance to changing environmental conditions and the development of new technologies to improve forest health and resistance to pest.

What has been done

One Evans-Allen research grant was funded to study plant-based mulch products for biophysical management of Oak trees in urban areas of Louisiana. Faculty & staff obtained an externally funded grant to develop biofuels from sustainable alternative non-food feedstocks in Louisiana. A third grant which ended August 2013 studied the application of nanotechnology in forest health management. Some of the goals were to quantify urban forest wood waste biomass; secondly, to process energy cane and various type of urban forest waste biomass with solvents and catalysts into high-quality bio-oil via exposure to electromagnetic fields; and to conduct economic analysis and impact assessment.

The SU Ag Center collaborated with scientists from the LSU AgCenter, USDA-FS, ISA, SAF, Louisiana State University (LSU), Louisiana Department of Environmental Quality (LA DEQ), the Louisiana Department of Agriculture & Forestry (LA DA&F), the Gulf Coast Cooperative Ecosystem Studies Unit (GC-CESU), and the City of Baton Rouge, LA. in these endeavors.

Graduate and undergraduate students from both Southern University and LSU gained useful research knowledge and skills through their involvement in these and other projects.

Two Ph.D. students from SU are currently working on the utilization of urban wood waste and agricultural wastes for ethanol production in collaboration with LSU. Findings from these research projects have been publicized in the form of presentations at international, national and regional conferences. The extension agents, research scientists, practitioners, land owners, etc. will continue to benefit from findings of these research projects.

Results

1. Number of undergraduates working in biofuels labs 6
2. Number of graduate students working in biofuels labs 8
3. Number of biofuels workers trained 7

A research symposium and two research seminars and one workshop have been conducted on

bioenergy and biofuel production in collaboration with the USDA, LSU, and E-Fuel corporation. A web-based educational bioenergy and biofuel video (Biofuel Research in Louisiana: SU Ag Center) was produced in collaboration with the SU Ag Center and made available on the internet. Two national presentations have been conducted through the Society of American Foresters (SAF) and the International Society of Arboriculture (ISA) conventions. Eight graduate students, one post-doctoral associate, and six undergraduate students were trained. The extension agents, research and academic communities, practitioners, land owners, etc. will continue to benefit from findings of these research projects.

4. Associated Knowledge Areas

| KA Code | Knowledge Area |
|---------|---|
| 123 | Management and Sustainability of Forest Resources |
| 124 | Urban Forestry |
| 125 | Agroforestry |

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

Ongoing economic struggle caused serious setback on the availability of funds. In FY 2013, state appropriations were increased for the first time in almost six years. Federal Sequestration caused reduction in appropriations thus resulting in budget problems. Government priority changes caused the relocation of some program participants resulting in decline in number of citizens impacted. Additionally, Louisiana rural population continued to lag behind other 1890 states which resulted in the SU Ag Center receiving less federal formula funds. Furthermore, the continuing recovery from previous hurricanes (2005 and 2008) and the 2010 oil spill caused problems in the state and impacted outcomes.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}