

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: 2012	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	3.0	0.0	2.0
Actual Paid Professional	0.0	2.0	0.0	6.5
Actual Volunteer	0.0	0.0	0.0	0.5

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	50723	0	104045
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	51275	0	137168
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	170231

V(D). Planned Program (Activity)

1. Brief description of the Activity

- In FY 2012 we conducted the following activities;
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. Communicatee 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. Organized grant writing workshops to empower individuals, businesses and communities enhance their skills on how to write for successful grants.
 6. Collaboratee with local, state and federal agencies, institutions, groups, private organizations/associations in seeking and delivering services to citizens.
 7. Encouraged community organizations and resident involvement in developing plans for sustainable energy. Provide 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 were 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

2012	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	1744	85853	0	0

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

Patent Applications Submitted

Year: 2012
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2012	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
2012	54

Output #2

Output Measure

- 2. Number of educational contacts

Year	Actual
2012	78411

Output #3

Output Measure

- 3. Number of published materials distributed

Year	Actual
2012	8339

Output #4

Output Measure

- 4. Number of research & extension outreach publications

Year	Actual
2012	6

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	1. Percent of clients who gained new knowledge and skills or gained awareness
2	2. Percentage of clients who adopt recommendations
3	3. Percentage of clients who utilized skills to gain positive results

Outcome #1

1. Outcome Measures

1. Percent of clients who gained new knowledge and skills or gained awareness

2. Associated Institution Types

- 1890 Extension
- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	70

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. 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. Louisiana producers, farmers, land owners and communities who are endowed with these natural resources need research-based information to make decisions that could impact their economic and social well-beings.

What has been done

Producers need new knowledge to plan and make decisions in adapting to changing environments, sustaining economic vitality, and taking advantage of emerging economic opportunities offered by the renewed wave in demand for alternative energy projects. Our scientists collaborated with scientists at LSU AgCenter to obtain a \$490,128 research grant to study the development of biofuels from sustainable alternative non-food feedstocks in Louisiana. Research was also conducted to assess and quantify plant-based mulch products especially for the management of live oak. Research-based information was made available to producers, farmers, land owners and community organizations in the form of meetings, site and home visits, and demonstrations. Twenty-eight educational activities were held for 805 individuals. Faculty members associated with the project have made four national, two international, and three statewide presentations. Collaborative efforts with the Gulf Coast Cooperative Ecosystem Studies Unit (GC-CESU) and non-profit organizations are impacting the restoration efforts in Louisiana, Mississippi and other neighboring states. Collaboration with the private sector and arboricultural

companies has promoted the utilization of wood waste, especially, the urban wood waste in Louisiana. Along with the RREA funding, outreach to extension agents was enhanced.

Results

Thirty educational events were organized, 300 landowners and managers were trained to develop stewardship and urban forestry plans, 5,000 direct and 4,000 indirect contacts were made to increase awareness of benefits and opportunities in urban and community forestry areas. Another 600 direct contacts were made to increase knowledge of benefits and opportunities available to landowners. Five urban forestry stewardship plans were developed, 100 landowners, urban foresters and arborists implemented at least one new practice. About 2,500 acres were impacted in Louisiana. From estimates, approximately \$560,000.00 were saved in avoided costs. Research-based educational materials on the utilization of wood-waste and biobased materials were provided to 5,400 participants at the Annual SAF Conferences and 6,000 participants at the Annual ISA Conferences. New outreach initiatives have been formulated to increase awareness of the climate change impact, plant biosecurity, and bioenergy. Several minority and underserved communities in Louisiana have been visited and printed educational materials been disseminated to 6,200 residents, arborists, farmers, and businesses. Two doctoral graduate students are gaining skills in conducting research through their involvement in the project. Data from the project were used by a student to developed doctoral dissertation. The program is helping many farmers consider diversification as an alternative to their traditional cropping method.

4. Associated Knowledge Areas

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

Outcome #2

1. Outcome Measures

2. Percentage of clients who adopt recommendations

2. Associated Institution Types

- 1890 Extension
- 1890 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	55

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 will end in 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.

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.

Results

Three research symposium, 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 through the

USDA technology transfer and the internet. A web site has been established to share the progress and accomplishment of the research. Two national presentations have been conducted through the Society of American Foresters (SAF) and the International Society of Arboriculture (ISA) conventions. A PhD level course was developed and offered in Spring 2013 on Bioenergy and Urban. 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

Outcome #3

1. Outcome Measures

3. Percentage of clients who utilized skills to gain positive results

2. Associated Institution Types

- 1890 Extension
- 1890 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	35

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Trees in cities can made a significantly contribution to human health and environmental quality. Regrettably, relatively little is known about the urban forest resource and its contribution to the local and regional society and economy. Forest structure is a measure of various physical attributes of the vegetation, including tree species composition, number of trees, tree density, tree health, leaf area, biomass, and species diversity. Forest functions, which are determined by forest structure, include a wide range of environmental and ecosystem services such as air pollution removal and cooler air temperatures. Forest values are an estimate of the economic worth of the various forest functions.

What has been done

To better understand the urban forest resource and its numerous values, the U.S. Forest Service, Northern Research Station, developed the Urban Forest Effects (UFORE) model, which is now known and distributed as i-Tree Eco at www.itreetools.org. Results from this model were used to advance the understanding of the urban forest resource, improve urban forest policies, planning and management, provide data to support the potential inclusion of trees within environmental regulations, and determine how trees affect the environment and consequently enhance human health and environmental quality in urban areas.

To help determine the vegetation structure, functions, and values of trees in the City of Baton Rouge LA, a vegetation assessment was conducted during the summer of 2011. For this assessment, 0.1-acre field plots were sampled and analyzed using the UFORE model.

Results

An analysis of trees in the city of Baton Rouge, LA, reveals that the area has about 1,036,175 trees with tree and shrub canopies that cover 44.6 % percent of the city. The most common tree species are live oak, sweet gum, loblolly pine, pecan, bald cypress, water oak, crape myrtle, and Southern magnolia. Trees in the City of Baton Rouge currently store about 2,029,342.2 tons of carbon per year with an associated estimated value of \$ 0.41 billion per year. In addition, these trees remove about 48,699.38 tons of carbon per year (178,354 tons CO₂/year) (\$1.1 million per year). Baton Rouge's trees are estimated to reduce annual residential energy costs by \$8.0 million annually. The structural value of the trees is estimated at \$ 6.2 billion. Information on the structure and functions of the urban forest can be used to inform urban forest management programs and to integrate urban forests within plans to improve environmental quality in the city of Baton Rouge.

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

Brief Explanation

Ongoing economic crisis caused serious setback on the availability of state funds in Louisiana in general and the SU Ag Center in particular. In FY 2012, state budgets were again drastically reduced at the beginning and in the middle of the fiscal year. This action resulted in severe loss of funding for planned activities which in turn negatively affected outcomes. Budget problems and government priority changes caused the relocation of some program participants resulting in decline in number of citizens impacted. Additionally, there was a decline in Louisiana rural population which resulted in the state receiving less federal formula fund. Furthermore, the continuing recovery from previous hurricanes (2005 and 2008) and the 2010 oil spill caused much 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}