

**V(A). Planned Program (Summary)**

**Program # 12**

**1. Name of the Planned Program**

Sustainable Energy

**V(B). Program Knowledge Area(s)**

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
101	Appraisal of Soil Resources	10%		0%	
102	Soil, Plant, Water, Nutrient Relationships	10%		0%	
123	Management and Sustainability of Forest Resources	25%		0%	
131	Alternative Uses of Land	10%		0%	
202	Plant Genetic Resources	10%		0%	
204	Plant Product Quality and Utility (Preharvest)	10%		0%	
402	Engineering Systems and Equipment	10%		0%	
601	Economics of Agricultural Production and Farm Management	5%		0%	
605	Natural Resource and Environmental Economics	10%		0%	
	<b>Total</b>	100%		0%	

**V(C). Planned Program (Inputs)**

1. Actual amount of professional FTE/SYs expended this Program

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Actual	5.2	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
64555	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
85668	0	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
584387	0	0	0

**V(D). Planned Program (Activity)**

**1. Brief description of the Activity**

- Develop educational materials, curriculum, & resources
- Workshops
- Field Days
- Demonstrations
- News Articles
- Newsletters
- Web-based Education
- Continuing Education
- Lab and Field Research

**2. Brief description of the target audience**

- Youth
- Agri Business
- Row Crop Agricultural Producers
- Consultants
- Forest Landowner Groups
- Forest Industry
- Loggers
- Natural Resource Professionals
- Landowners
- Educators
- Agency personnel
- Livestock producers
- Watershed and other Not-for-profit organizations
- General public
- Researchers
- Policy makers
- Research funding personnel and agencies

**V(E). Planned Program (Outputs)**

**1. Standard output measures**

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Plan</b>	{NO DATA}	{NO DATA}	{NO DATA}	{NO DATA}
<b>Actual</b>	2654	1708	366	16

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

**Patent Applications Submitted**

Year: 2010

Plan:

Actual: 0

**Patents listed**

**3. Publications (Standard General Output Measure)**

**Number of Peer Reviewed Publications**

2010	Extension	Research	Total
<b>Actual</b>	2	4	6

**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- Number of educational events held related to sustainable energy

Year	Target	Actual
2010	{No Data Entered}	204

**Output #2**

**Output Measure**

- Number of sustainable energy field demonstrations.

Year	Target	Actual
2010	{No Data Entered}	6

**Output #3**

**Output Measure**

- Number of field days related to sustainable energy.

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2010	{No Data Entered}	17

**Output #4**

**Output Measure**

- Number of educational materials & curriculum developed and/or delivered.

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2010	{No Data Entered}	5

**Output #5**

**Output Measure**

- Number of sustainable energy events for row crop producers.

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2010	{No Data Entered}	2

**Output #6**

**Output Measure**

- Number of sustainable energy events for livestock producers.

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2010	{No Data Entered}	1

**Output #7**

**Output Measure**

- Percentage of farmers using biofuel in their farm equipment.  
Not reporting on this Output for this Annual Report

**V(G). State Defined Outcomes**

**V. State Defined Outcomes Table of Content**

O. No.	OUTCOME NAME
1	Number of landowners indicating an increased understanding of sustainable energy.
2	Number of locations for bioenergy crop demonstrations and research fields.
3	Economic value of bio-based fuels produced.
4	Diversification of bioenergy crops.

**Outcome #1**

**1. Outcome Measures**

Number of landowners indicating an increased understanding of sustainable energy.

Not Reporting on this Outcome Measure

**Outcome #2**

**1. Outcome Measures**

Number of locations for bioenergy crop demonstrations and research fields.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Quantitative Target</b>	<b>Actual</b>
2010	{No Data Entered}	6

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
101	Appraisal of Soil Resources
102	Soil, Plant, Water, Nutrient Relationships
131	Alternative Uses of Land
202	Plant Genetic Resources
204	Plant Product Quality and Utility (Preharvest)
601	Economics of Agricultural Production and Farm Management

### **Outcome #3**

#### **1. Outcome Measures**

Economic value of bio-based fuels produced.

Not Reporting on this Outcome Measure

### **Outcome #4**

#### **1. Outcome Measures**

Diversification of bioenergy crops.

#### **2. Associated Institution Types**

- 1862 Research

#### **3a. Outcome Type:**

Change in Condition Outcome Measure

#### **3b. Quantitative Outcome**

<b>Year</b>	<b>Quantitative Target</b>	<b>Actual</b>
2010	{No Data Entered}	6

#### **3c. Qualitative Outcome or Impact Statement**

##### **Issue (Who cares and Why)**

Agriculture producers are not prepared to deal with the challenges posed by energy crops. Issues from planting to harvest are unknown and unstudied under Arkansas conditions. With increased interest and demand for energy feedstocks Arkansas growers are seeking answers. Research has been conducted related to cropping systems for high oil soybeans, Canada grass, switchgrass, sweet sorghum, hybrid poplar, and elephant grass (miscanthus).

##### **What has been done**

##### **Results**

#### **4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
102	Soil, Plant, Water, Nutrient Relationships
131	Alternative Uses of Land
204	Plant Product Quality and Utility (Preharvest)

## **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
- Other (Emerging Technologies)

### **Brief Explanation**

Sustainable energy crops are easily impacted by external forces beyond our control. These diverse external factors can include changes in the economy, markets for other energy sources, shifts in public policy, and technology. Relatively new program area efforts continue with future expected outcomes.

## **V(I). Planned Program (Evaluation Studies and Data Collection)**

### **1. Evaluation Studies Planned**

- After Only (post program)
- Before-After (before and after program)
- Case Study
- Comparison between locales where the program operates and sites without program intervention
- Other (Economic Models)

### **Evaluation Results**

Programs in sustainable energy are relatively new, therefore the evaluation process is in its early stages. For example, field demonstrations indicate that the technological processes for developing sustainable energy through biomass sources exists, however, the economy viability is unknown.

### **Key Items of Evaluation**

The UA Division of Agriculture Experiment Station received a 1.9 million dollar multi-state DOE grant in 2009 to develop bioenergy programs. This includes oil seed crops for biodiesel and biomass crops for ethanol and syngas production.