

**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
125	Agroforestry	17%			
403	Waste Disposal, Recycling, and Reuse	8%			
601	Economics of Agricultural Production and Farm Management	25%			
608	Community Resource Planning and Development	25%			
902	Administration of Projects and Programs	12%			
903	Communication, Education, and Information Delivery	13%			
	<b>Total</b>	100%			

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

1. Actual amount of FTE/SYs expended this Program

Year: 2013	Extension		Research	
	1862	1890	1862	1890
Plan	6.0	0.0	0.0	0.0
Actual Paid Professional	6.9	0.0	0.0	0.0
Actual Volunteer	35.0	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
193219	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
193219	0	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
629840	0	0	0

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

**1. Brief description of the Activity**

- Lead short course and training seminars for industry personnel and growers;
- Conduct basic and applied research in alternative fuel sources, energy saving techniques and recycling of green waste products;
- Engage with community and environmental organizations;
- Contribute to trade and peer reviewed journal publications.

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

- Forest owners and managers;
- Agricultural managers;
- Community members;
- Environmental organizations;
- Livestock growers and managers;
- Energy (and bio-energy) industry;
- Research community at large

**3. How was eXtension used?**

In 2013, Oregon's use of Ask an Expert continued to grow across the 36 counties, with 3032 questions answered in the system. Oregon remains among the top five participants in the nation for Ask an Expert activity. Question response time remains the best of any state at 38 hours, well below the 48 hour target suggested nationally. Over 200 Extension faculty and staff and some 30 Master Gardener volunteers are actively answering questions from Oregon and beyond.

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

**1. Standard output measures**

2013	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Actual</b>	3353	7786	18062	6992

**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
<b>Actual</b>	3	0	0

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

**Output Target**

**Output #1**

**Output Measure**

- Number of Educational Classes to be Conducted

Year	Actual
2013	28

**Output #2**

**Output Measure**

- Number of Workshops to be Conducted

Year	Actual
2013	26

**Output #3**

**Output Measure**

- Number of Group Discussions to be Conducted  
 Not reporting on this Output for this Annual Report

**Output #4**

**Output Measure**

- Number of Demonstrations to be Conducted

<b>Year</b>	<b>Actual</b>
2013	3

**Output #5**

**Output Measure**

- Number of Newsletters to be Published

<b>Year</b>	<b>Actual</b>
2013	36

**Output #6**

**Output Measure**

- Number of Web Sites to be Developed and Maintained

<b>Year</b>	<b>Actual</b>
2013	12

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

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

O. No.	OUTCOME NAME
1	Agricultural producers increase their knowledge regarding the use of agricultural crops for energy production. (Percent increase of attendees to workshops, field days and demonstrations.)
2	Forest owners and managers increase their knowledge regarding the use of forest biomass as an energy source. (Percentage increase in knowledge of attendees to workshops, field days, and demonstrations.)
3	Coastal stakeholders increase their knowledge of wave energy. (Percentage increase in knowledge of attendees to workshops, field days, and demonstrations.)

## **Outcome #1**

### **1. Outcome Measures**

Agricultural producers increase their knowledge regarding the use of agricultural crops for energy production. (Percent increase of attendees to workshops, field days and demonstrations.)

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

- 1862 Extension

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

Change in Knowledge Outcome Measure

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

<b>Year</b>	<b>Actual</b>
2013	36

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

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

Aviation uses a lot of fuel. According to John Talbott, director of the Western Region Sun Grant based at Oregon State, the industry's biggest uncertainty is not ridership, but fuel prices. Of all the factors impacting fuel prices, many are unpredictable, such as Middle East politics or hurricanes in the Gulf. One way to stabilize long-term prices would be to find alternative fuel sources that can be produced renewably and domestically.

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

Camelina is a particularly promising source for producing jet fuel. Because its oil is relatively high in omega-3 fatty acids and low in saturated fatty acids, camelina is considered a high-quality edible oil as well as a source for jet fuel. OSU agronomists have put camelina to the test and found that it can be grown with few input costs and under marginal conditions, so it has potential both as a dryland crop in Eastern Oregon and as a rotation crop with grass seed in the Willamette Valley.

#### **Results**

Although adoption of camelina is not yet a common practice among growers, workshops, field days, and demonstrations are increasing their knowledge regarding the use of this agricultural crop for energy production and its economy return to the producer. Post-event interviews indicate a growing interest in camelina with expressed interest in on-farm field trials for the 2013 growing season.

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

<b>KA Code</b>	<b>Knowledge Area</b>
403	Waste Disposal, Recycling, and Reuse

601	Economics of Agricultural Production and Farm Management
608	Community Resource Planning and Development
902	Administration of Projects and Programs
903	Communication, Education, and Information Delivery

## **Outcome #2**

### **1. Outcome Measures**

Forest owners and managers increase their knowledge regarding the use of forest biomass as an energy source. (Percentage increase in knowledge of attendees to workshops, field days, and demonstrations.)

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

- 1862 Extension

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

Change in Knowledge Outcome Measure

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

<b>Year</b>	<b>Actual</b>
2013	33

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

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

Forest harvest residues (slash) left after harvesting, are normally put into a roadside grinder to increase their bulk density before shipping to a plant because branches and tops occupy about 4-5 times the volume of solid wood. This process is known as bundling. Although density is increased significantly by grinding there are several disadvantages. First, the grinding takes place in the field using diesel. Diesel, in the Pacific Northwest, is about three times the cost per unit of energy as electricity. Second, the ground materials are transported in large chip vans that do not have the mobility that stinger-steered log trucks have. Chip vans are restricted to flatter grades, require wider roads, and must have a larger area to turn around. Third, forest residues, once ground, do not continue to dry, and under some conditions are subject to spontaneous combustion.

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

Oregon's Wood Innovation Center is investigating all opportunities to reduce feedstock supplies including bundling and baling. Activities include grinding tests of residues and slash bales to compare energy requirements for comminution, examine opportunities to increase bale density, and to measure moisture content reduction over time for baled residues. A variety of workshops, field days, webinars and conferences have been conducted for forest owners and managers.

#### **Results**

Evidence collected to date shows an increase in knowledge among forest owners and managers regarding the use of forest biomass as an energy source; however, early feedback suggests that bioenergy in general is really a large-scale industrial topic not well-suited to the small, private landowner. Until practical, affordable solutions to issues like transporting residues and bundling are proven, interest to embrace forest biomass as a viable economic option is low.

#### 4. Associated Knowledge Areas

KA Code	Knowledge Area
125	Agroforestry
403	Waste Disposal, Recycling, and Reuse
608	Community Resource Planning and Development
902	Administration of Projects and Programs
903	Communication, Education, and Information Delivery

#### Outcome #3

##### 1. Outcome Measures

Coastal stakeholders increase their knowledge of wave energy. (Percentage increase in knowledge of attendees to workshops, field days, and demonstrations.)

Not Reporting on this Outcome Measure

#### 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

##### Brief Explanation

This planned program in the second year of the Plan of Work continues to move forward as a start-up effort. For community outreach to be most effective research outcomes are required. Until growers and producers have practical, affordable solutions to their concerns, bio-processing plants are accessible, and there are greater demands from consumers for bio-based fuels, adoption will be slow. Meanwhile, Extension educators continue to promote biomass as an option for growers and producers to consider.

After the 2012 report about Sea Grant Extension's role in securing one of the nation's first public wave energy testing sites for the Oregon Coast, most of the 2013 efforts have focused on project management and operations. In fall 2013 outreach and engagement activities began which will lead to better understanding of the political and regulatory processes surrounding wave energy and its environmental, social and economic sustainability. Stay tune for an update in the 2014 report.

## **V(I). Planned Program (Evaluation Studies)**

### **Evaluation Results**

Although adoption of camelina is not yet a common practice among growers, workshops, field days, and demonstrations are increasing their knowledge regarding the use of this agricultural crop for energy production and its economy return to the producer.

Evidence collected to date shows an increase in knowledge among forest owners and managers regarding the use of forest biomass as an energy source; however, early feedback suggests that bioenergy in general is really a large-scale industrial topic not well-suited to the small, private landowner.

### **Key Items of Evaluation**