V(A). Planned Program (Summary)

Program # 6

1. Name of the Planned Program

Climate Change

☑ 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
102	Soil, Plant, Water, Nutrient Relationships	20%			
112	Watershed Protection and Management	10%			
123	Management and Sustainability of Forest Resources	25%			
124	Urban Forestry	10%			
125	Agroforestry	20%			
131	Alternative Uses of Land	5%			
605	Natural Resource and Environmental Economics	10%			
	Total	100%			

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2012	Extension		Research	
	1862	1890	1862	1890
Plan	8.0	0.0	0.0	0.0
Actual Paid Professional	11.0	0.0	0.0	0.0
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**
643345	0	0	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
427705	0	0	0
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

In 2012, the Climate Change planned program at West Virginia University Extension worked towards developing an agriculture system that maintains high productivity in the face of climate changes. It helps producers plan for and make decisions to adapt to changing environments and sustain economic vitality and take advantage of emerging economic opportunities offered by climate change mitigation technologies.
Objectives addressed in this program area include:

1. Decrease risk and loss to farming operations through use of risk mitigation tools and control of predation
2. Improve woodlot conditions and expand forest and non-timber product production
3. Improve the business and management competencies of forest/wood industry businesses.
4. Increase compliance with and knowledge of the WV Best Management Practices for controlling soil erosion and sedimentation from logging operations.
5. Increase the capacity of local communities and landowners in nutrient management and sustainability
6. To address topics of interest and concern citizens have about the natural gas industry in WV.

The growth and economic development of the Marcellus shale in West Virginia provides opportunities for public and private landowners, local communities, and local and state governments to benefit from monies generated from land leases and royalties. However, with this economic growth and development comes safety and environmental concerns. The WVU Extension Service (WVU-ES) Agriculture and Natural Resources (ANR) Program Unit's Natural Gas Education Team (NGET) was formed to address topics of interest and concern citizens have about the natural gas industry in WV.

Activities under several categories including: composting and utilization, nutrient management, forestry, logging and milling, hay production, grassland management. Topics include: agricultural and cover crop, calibration methods & demonstration, WV GreenUp logging, forage economics, forage sampling and testing, nutrient management, grassland management, risk mitigation, and natural gas education.

2. Brief description of the target audience

Target audiences include private forestland owners, forestry professionals, researchers, general public.

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	3730	392237	184	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	1	1	2

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of educational activities

Year	Actual
2012	146

Output #2

Output Measure

- Number of educational materials created or updated

Year	Actual
2012	11

Output #3

Output Measure

- Number of professional presentations

Year	Actual
2012	9

Output #4

Output Measure

- Number of outside organizations collaborating with this program area

Year	Actual
2012	3

Output #5

Output Measure

- Number of educational materials distributed

Year	Actual
2012	391737

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of participants who increase their knowledge
2	Number of participants who improve or increase skills
3	Number of participants who change a behavior or use a new skill
4	Number of groups or organizations that change their procedures and/or policies
5	Number of new groups or organizations that are established or enhanced
6	Number of physical or social effects, such as disease, pollution, or crime, etc., reduced or eliminated
7	Number of economic improvements
8	Number of environmental improvements

Outcome #1

1. Outcome Measures

Number of participants who increase their knowledge

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	1770

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The Renewable Resources Extension Act (RREA) at West Virginia University puts landowners in touch with natural resources professionals and educates citizens about forests, wildlife, and water resources. Education programs developed for the 270,000 private landowners aim to demonstrate the importance of natural resources and how these resources can be managed to assure they are available for current and future use.

What has been done
RREA supported the production of the Acid Mine Drainage Task Force Symposium in Morgantown. Extension Specialists facilitated youth forestry contests and activities including the WV Conservation Camp, the National 4-H Forestry Invitational, and the Future Farmers of America state forestry contest. An outreach effort concerning forestry laws and regulations was conducted. Groups of individuals participated in "Walks in the Woods" and other natural resources seminars.

Results
-- 170 natural resources professionals gained knowledge of forestry laws and regulations.
-- 300 professionals gained knowledge of the issues surrounding acid mine drainage.
-- 100 youths gained knowledge of conservation and natural resources
-- 1200 woodland owners, nature enthusiasts, and interested citizens gained knowledge of forests, woodlands and wildlife though participating in "Walks in the Woods."

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

Number of participants who improve or increase skills

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	35

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
This WV Green-Up Certified Logger Training Program was designed to familiarize trainees with the logging industry through a series of training modules. The training is provided at no cost to the participant and will meet the requirements for becoming a licensed logger in the State of WV. The program is a six-day training program that qualifies participants for certification.

What has been done
An Extension specialist taught classes for WV GreenUp Certified Logger Training Program. An Extension specialist also conducted on-site evaluations at West Virginia work sites and worked with logger to develop safe, productive, and environmentally sensitive harvest plan and implementation of new cable logging system.

Results
Participants gained skills related to the logging industry.
Participants from the state of WV qualified for certification in the WV GreenUp Certified Logger Training Program.

Loggers developed safe, productive, and environmentally sensitive harvest plan and implementation of new cable logging system.

4. Associated Knowledge Areas

KA Code	Knowledge Area

123	Management and Sustainability of Forest Resources
125	Agroforestry

Outcome #3

1. Outcome Measures

Number of participants who change a behavior or use a new skill

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	93

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
West Virginia's portion of the Chesapeake Bay watershed is the land that drains into the Potomac River and a small area that drains into the James River. The pollutant reduction mechanisms of cover crops are: improved stabilization of soil surface, improved water infiltration and nutrient adsorption, increased crop growing season, reduced in-field volume of runoff water, reduced erosion and transport of nutrient enriched sediments, temporary nutrient sequestration; rapping and retention of nutrient enriched sediments; and vegetative assimilation.

What has been done
Extension specialist gave cover crop demonstrations for landowners in or near the Chesapeake Bay watershed. Topics included planting, nutrient cycling, and use of roller crimper.

Results
The adoption of cover crops by 93 landowners in the Chesapeake Bay watershed increased.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
112	Watershed Protection and Management

Outcome #4

1. Outcome Measures

Number of groups or organizations that change their procedures and/or policies

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
With the prevalence of wrapped hay or balage for cattle some questions have arisen about the common practices and their effect on quality of the hay. It is also suggested that there may be some guidelines that can help to improve the quality of hay managed in this manner and also prevent losses of livestock as a result of improperly made balage.

What has been done
In consultation with Dr. Les Vough (emeritus professor from the University of Maryland) WVU Extension specialists developed a list of BMPs that produce well fermented baleage. In 2011 they analyzed 19 lots of baleage while in 2012 they have analyzed 22 samples. The results will be presented at county, state, and regional extension educational meetings and developed into a fact sheet.

Results
--Moisture appears to be the biggest single factor in determining fermentation quality in baleage. As the moisture content in the sampled forage dropped below 50% the VFA Score dropped accordingly (Fig. 1). This relation was basically identical for both 2011 and 2012.
--Based on the 41 samples in the data set when forage moisture was less than 50% there was an 80% probability that the VFA Score would be less than 6. Since we had few samples with moisture greater than 60% we could not quantify the negative effects of having forage baled when it was too wet or over 70% moisture.
--This information will show farmers what baleage BMPs are needed for good baleage fermentation and what BMPs they may need to improve on in their operation.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
605	Natural Resource and Environmental Economics

Outcome #5

1. Outcome Measures

Number of new groups or organizations that are established or enhanced

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The Summit Bechtel Family National Scout Reserve (SBR) is located in Mount Hope, West Virginia, between Beckley and Glen Jean and is one of four facilities managed by the National Council of the Boy Scouts of America (BSA). The Summit is the future home of the national Scout jamboree, the Summit High Adventure Base, and the National Center for Scouting Excellence. The 10,600 acre Boy Scout Camp that will serve as the site of the 2013 Boy Scout Jamboree. It is anticipated that there will be 50,000 attendees at the 2013 National Scout Jamboree

What has been done
The WVU ES Land Reclamation Specialist helped with the development of the new Bechtel Reserve. The current goals of construction at the site are developing infrastructure, providing access to the area's resources for outdoor activities, and preparing for the Jamboree.

Results
RREA has supported land reclamation advisory services at the Bechtel Reserve, a 10,600 acre Boy Scout Camp near Beckley, West Virginia. The Summit is expected to inject $25.3 million into the local economy annually.

4. Associated Knowledge Areas

KA Code	Knowledge Area
131	Alternative Uses of Land

605 Natural Resource and Environmental Economics

Outcome #6

1. **Outcome Measures**

Number of physical or social effects, such as disease, pollution, or crime, etc., reduced or eliminated

Not Reporting on this Outcome Measure

Outcome #7

1. **Outcome Measures**

Number of economic improvements

Not Reporting on this Outcome Measure

Outcome #8

1. **Outcome Measures**

Number of environmental improvements

Not Reporting on this Outcome Measure

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Other (Audience objections to the topic of Marcellus Shale technology and use.)

Brief Explanation

Two major storms - flooding, damage to homes and property.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Moisture appears to be the biggest single factor in determining fermentation quality in baleage. As the moisture content in the sampled forage dropped below 50% the VFA Score dropped accordingly (Fig. 1). This relation was basically identical for both 2011 and 2012.

Based on the 41 samples in the data set when forage moisture was less than 50% there was

an 80% probability that the VFA Score would be less than 6. Since we had few samples with moisture greater than 60% we could not quantify the negative effects of having forage baled when it was too wet or over 70% moisture.

This information will show farmers what baleage BMPs are needed for good baleage fermentation and what BMPs they may need to improve on in their operation.

Key Items of Evaluation