THE GUS R. DOUGLASS
LAND-GRANT INSTITUTE
West Virginia State University
AGRICULTURAL, CONSUMER, ENVIRONMENTAL, & OUTREACH PROGRAMS

West Virginia State University

Annual Report of Accomplishments and Results

(FY 2005)

For Plan of Work FY 2005-2006

1890 Cooperative Research & Cooperative Extension

Orlando F. McMeans, Ph.D.

DEAN AND DIRECTOR

Gus R. Douglass Land-Grant Institute
for Agricultural, Consumer, Environmental, and Outreach Programs

Annual Report of Accomplishments and Results
- FY 2005 -

TABLE OF CONTENTS

SECTION I. INTRODUCTION

Report Summary & Structure

This report offers an update of the annual accomplishments for research and extension programs conducted by the Agricultural and Environmental Research Station (AERS) and the West Virginia State University Extension (WVSUE) Units at West Virginia State University (WVSU) for fiscal year 2005. As required by the USDA-CSREES, the report has been structured so it describes each of the 1890 research and extension programs (by key themes) and their impacts, based on the five national initiatives. A summary of resources, including personnel and financial allocations invested for each of these five national mandated goals and key themes, is included at the beginning of sections II and III. The report is divided into three sections: Section I affords an introduction, and Sections II and III describe the accomplishments and results for the institution's 1890 Research and Extension Programs, respectively.

Institutional Updates

West Virginia State College was recognized by the State's Legislature as West Virginia State University (WVSU) in April 4, 2004. The University became fully reinstated as an 1890 Land-Grant Institution in November of 2001. WVSU began the reactivation of its research and extension programs in FY 2000. The Department of Land-Grant Programs was officially established on March 17, 2000 to serve as the land-grant administrative and operational entity of the University. This Department was elevated to a Division of Agricultural, Consumer, Environmental, and Outreach Programs (or Division of ACEOP) in 2003. More recently, on March 15, 2006, the Division became **"The Gus R. Douglass Land-Grant Institute"** to better accommodate the growth of this unit and to better serve the University's constituents. The mission of this unit remains that of delivering the institution's land-grant mission related to the dissemination of research, teaching, and extension services to the state's citizens.

As it relates to Federal formula funds, the fiscal support for FY 2005 was maintained at slightly over $1 M for extension and $ 1 M for research. Prior to FY 2006, the University had received in two occasions, state appropriated dollars to meet the matching of its formula funding when the State Legislature recognized the need for the University's state match as a means to preserve the level of Federal funding coming into the State. This year, the State Legislature not only appropriated state dollars to meet the 90% match, but also secured a line item within the institution's budget to meet the match in the years to come. As state appropriations and other federal and non-federal funding are attained, the University is in the position to extend its research and extension services to additional counties in the state.

Merit Review

The current merit review process used to conduct land-grant related research projects takes into account the recommended steps in the research CSREES administrative

manual. All new and existing research projects are subjected to the following criteria: (*1*) Submitted proposals are complete per the guidelines in the Administrative Manual, *Appendix F*, (*2*) The proposal is relevant to society's food and agricultural needs, (*3*) The research proposals are scientifically sound, (*4*) Cooperative opportunities will be encouraged whenever possible, (*5*) Project leaders will be given ample opportunity to interact with reviewers in efforts to strengthen proposals, and (*6*) Documentation of compliance with these goals is kept on file and sent to CSREES upon request. Identified research stakeholders serve as advisors to evaluate the merit of research proposals.

Each year, during the months of March and April, all programs are subjected to a review process. The process includes an internal and external evaluation. An oral presentation at the Annual Research Symposium is a key component of the overall annual evaluation and it is required for land-grant sponsored researchers. Stakeholders identified by the procedures outlined below are invited to the Symposium. The internal evaluation consists of an Office and/or Departmental appraisal by the executive staff. Additionally, all participants in land-grant sponsored research critically assess the research of fellow colleagues for developmental purposes.

A research advisory panel conducts the external program evaluations. The research advisory panel consists of local scientists with a wide variety of backgrounds, business leaders and other appropriate stakeholders. The evaluations from these panels are utilized to help rank and allocate funds to specific land-grant programs. Evaluation assessing research productivity versus resources spent will be included in the ranking of continuing projects to facilitate funding decisions during the next budget year.

Faculty Appointment Policy

The University's Institute of Land-Grant Programs (for ACEOP) and the Academic Affairs Unit have developed an appointment system that allows faculty to participate in land-grant research funded activities. This appointment system further allows land-grant staff members to participate in the University's teaching activities, when and if required. The system operates on a mechanism designed to exchange appointment time between the Units of Land-Grant Programs and the Academic Departments of the University.

Stakeholder Input and Environmental Scanning

West Virginia State University Extension is expanding its presence in the State of West Virginia. The current Institution's strategy of expansion, as it relates to the delivery of its land-grant programs, is based on an environmental scan and needs assessment. Assessing the needs and strengths of stakeholders allows our staff to identify those communities (and/or stakeholders) with the greatest need within the state. Specialists design programs that are responsive to these needs and agents and extension associates deliver educational programs that address the challenges faced by our target stakeholders.

Town hall meetings have proven essential to identify our community stakeholders and their needs. Extension personnel held a series of community forums and town hall meetings throughout the year in our servicing areas. Feedback from stakeholders has shown the need for programs that address high unemployment, illiteracy among adults, teen pregnancy, inadequate nutrition, lack of activities for children and youth after school and the digital divide. Programmatic efforts were directed toward these issues. Partnerships with community-based organizations have also been useful to retrieve information pertinent to the needs of our stakeholders. Faith based organizations have been useful to affiliate with a community development entity whose interests and accomplishments would support and further the mission of serving as a resource center and broker for the communities the University serves. Additionally, in FY 2005 West Virginia State University began using a twice yearly meeting of a stakeholder advisory council to provide direct input into program development. The participants on this advisory body are representative of the five Extension program areas and many of the members are programmatic partners or participants

As it relates to 1890 Research Programs, stakeholders are identified by several means: (*1*) Principal investigators of proposals must identify relevant WV stakeholders, (*2*) The research office staff canvas both WV industry officials and WV government agency representatives relevant to the proposal and select at least one of each to participate in the merit review of the proposed project, (*3*) The research office staff solicits public comment on proposed projects through media advertisements and open meetings, and (*4*) Finally, the Associate Director of Research constructs an advisory panel tailored to each proposal. The Associate Director of Research chairs the advisory panels, provide administrative support, including proposal evaluation instruments, and ensure that WVSU regulations regarding scientific validity and USDA regulations on merit review are followed.

Evaluation of Multi and Joint Activities

The lead institution in multi or joint activities is normally responsible for evaluations. The leading institution's internal and USDA-approved policies and procedures are followed in the evaluation when multi or joint activities take place.

Collaborative Programs: 1862 & 1890 Institutions

West Virginia University and West Virginia State University entered into a voluntary agreement in 1997 to create the West Virginia Association of Land-Grant Institutions; a collaboration of the state's two land-grant institutions committed to providing education that would help the citizens of West Virginia improve their lives and communities. More recently (in 2005), triggered by an USDA-CSREES mandate, the two Universities developed a Comprehensive Plan for the State which superseded the former agreement. This plan assures appropriate coordination between the two institutions to avoid duplication of efforts, as it relates to their research and extension programming, and thus an efficient investment of human and financial resources within the State.

SECTION II
WVSU Agricultural & Environmental Research Station - AERS
(1890 Research Programs)

Table 1 WVSU AERS: Resource Allocation Summary (*by Goal and Program*)

1890 RESEARCH PROGRAMS (AERS)

ANNUAL ALLOCATION OF RESOURCES *(FY 2005)*							
NATIONAL GOAL / INSTITUTIONAL PROGRAM		FUNDING SOURCE					
Goal	*Program Area*	*Federal Formula*	*Federal Other*	*State Match **	*Other*	*TOTAL*	*SY's*
GOAL I							
Program 1.1	Agricultural Biotechnology	443,685	94,822	141,979	25,269	*705,755*	4.0
Program 1.2	Alternative Agriculture	105,685	23,940	44,047	0	*173,673*	2
	Total	**549,370**	**118,762**	**186,027**	**25,269**	***879,428***	***6.00***
GOAL II							
Program 2.1	Food Quality and Safety	0	0	0	0	*0*	0
	Total	**0**	**0**	**0**	**0**	***0***	***0.00***
GOAL III							
Program 3.1	Human Health and Nutrition	0	0	0	0	*0*	0
	Total	**0**	**0**	**0**	**0**	***0***	***0.00***
GOAL IV							
Program 4.1	Environmental Conservation and Remediation	29,254	20,000	11,702	0	*60,955*	1.00
Program 4.2	Microbiology	425,370	476,516	158,663	0	*1,060,549*	8.00
	Total	**454,624**	**496,516**	**170,365**	**0**	***1,121,504***	***9.00***
GOAL V							
Program 5.1	Regional Economic Forecasting	0	0	0	0	*0*	0
	Total	**0**	**0**	**0**	**0**	***0***	***0.00***
	GRAND TOTAL	***$ 1,003,994***	***$ 615,278***	***$ 356,391***	***$ 25,269***	***$ 2,000,933***	***15.00***

***** *State match appropriations spent between October 1, 2004 thru June 30, 2005*

WVSU AERS - 1890 Research Overview

West Virginia State University has worked diligently to establish land-grant related research programs that are responsive to the critical needs prevailing in the state. The University continues to implement and advance reputable programs within the scientific community. However, the University is still in great need to develop infrastructure and research capacity. With the assistance of additional funding such as state match, facilities and capacity building programs, and private funding, the institution is planning to position itself as an important research player in the state. The funding received for fiscal year 2005 was devoted to advancing the institution's 1890 research programs and to build research capacity. Three qualified scientists have been hired to develop and advance the research programs that are congruent with the institutional plan of work and strategic plans. Furthermore, the recent establishment of graduate programs (in Biotechnology and Media Studies, August 2003) has provided our 1890 research programs an opportunity to employ graduate students that have conducted more

sophisticated research projects. *Table 1* provides a summary of the level of effort for the 1890 research programs as it relates to the allocation of resources by goal and program. The following sections present with greater detail the accomplishments for each goal and programs established in the institution's plan of work for fiscal year 2005.

The following section presents an account of program accomplishments and impacts by goal and program area:

Goal 1: To achieve an agricultural production system that is highly competitive in the global economy…

Executive Summary:

(A) Several research projects are addressing issues to improve the competitiveness of WV agriculture. Part of the WVSU biotechnology research efforts has been devoted to determine the controls of plant cell division. Understanding the role of plant hormones in this process and other phases of plant development will result in the identification of biochemical targets that modify crop growth and development – establishing the basis for improved agricultural products. WVSU aquaculture research has diversified into several projects including formulating aquaculture feeds from digested poultry litter and assessments of the effects of diet on both cold and warm water fishes. A project involving plant genomics was initiated in 2003. It focuses on developing new greenhouse tomato varieties for the southern US growers. The application of DNA marker technology for genetic improvement of pepper and watermelon is essential for genetic mapping and for gene manipulation. A gene mapping project focuses on building extensive genomic resources for these crops and identifying germplasm with disease and pest resistant genes.

(B) These projects have not fully completed their research goals as they are continuing. Moreover, local growers and producers are aware of our research efforts on their behalf. Grower and/or producer feedback and needs continue to guide future planning, as it relates to research efforts. These activities are refining and focusing our efforts and should bring improvements resulting in more competitive WV agriculture.

(C) All of the established research programs (projects) are showing benefits to clientele and stakeholders. Furthermore state producers are now aware of WVSU's research activities and they recognize the potential to improve their agricultural activities

(D) Some of the short-term outcomes have been documented, however due to the newness of these programs other long-term outcomes are still being effected.

(E) Resource Allocation: **Total Invested:** $879,428
Formula Funds: $549,370
SY: 6.00

Program 1.1: Agricultural and Biotechnology

Project 1: *Plant Growth and Development*

Description: The regulatory mechanisms that control the metabolism of cytokinins (a major plant growth regulator) affect all phases of plant development and conditioning. In addition, these mechanisms affect many of the physiological responses of plants to their environment. The nature of these regulatory mechanisms remains one of the major unsolved problems in plant hormone physiology. Understanding these mechanisms is essential for the identification of novel biochemical targets that modify crop/plant growth and development, and is vital for scientists working to recover genetically altered plants.

a) **Results**. BY-2 tobacco suspension cultures have been established in the WVSU lab and numerous experiments have been conducted to establish base line information on these cells. Data includes the concentration and occurrence of ascorbate metabolites and correlations of these metabolite pools with specific phases of the cell cycle. Sophisticated procedures have been developed to synchronize and manipulate the cell cycle with various cell division factors and inhibitors that were added to the culture media.

b) **Successes Resulting in Change** (Outcomes): The plant cell suspension technology developed in this work has been extended to the WVSU Master's Program in Biotechnology. The graduate laboratory classes in biotechnology are using the BY-2 cell lines to demonstrate some of the latest techniques in plant biotechnology.

c) **Stakeholder Benefits** (Impacts): These research efforts have been shared with cell biologists in the US and Europe. The results are changing scientific understanding of how ascorbate metabolism impacts plant cell division. The work has allowed new experimental directions in this field to be advanced.

d) **Assessment of Accomplishments:** This project will be terminated in 2006.

e) **Source of Expenditures & Impact Scope:**
Funding Source- Evans-Allen (Section 1445); State Match
Scope of Impact- State-specific, 1890 Research

Project 2: *Microbiology*

Description: Anaerobic digester technology for waste management is becoming a more attractive option for adding value to animal manure and improving nutrient management of associated nitrogen and phosphorus. The function of digesters requires the cooperation of complex consortia of bacteria. The quantitative detection of key populations is needed in order to develop predictive models for digester control. In addition, the heavy use of antibiotics on poultry is a well known problem that may contribute to the spread of antibiotic resistant human pathogens. Development of reliable real-time PCR techniques to identify and quantify bacterial populations and identification of antibiotic resistant microbes in poultry litter is the focus of microbiology research at WVSU.

a) **Results**: Shamblin, L. K., A. Parsons and D. H. Huber. 2005. Te effect of thermophilic anaerobic digestion on antibiotic resistant bacteria in poultry litter. American Society for Microbiology 105th General Meeting, June, Atlanta, GA, **oral and poster presentations**.

b) **Successes Resulting in Change** (Outcomes): This research has advanced our ability to monitor the specific presence of key bacterial populations that are required for proper digester operation. The research is also developing methods for detecting tetracycline resistance genes found on poultry farms.

c) **Stakeholder Benefits** (Impacts): No impacts to report at this time.

d) **Assessment of Accomplishments**: The projects are progressing and should be continued.

e) **Source of Expenditures & Impact Scope:**

Funding Source-

- Evans-Allen (section 1445) 2003-2005
- Bioplex Phases 4 & 5 2004-2005

Scope of Impact- State, Regional, National, International

Program 1.2: Alternative Agriculture

Project 1: *Alternative Crop Production*

Description: Alternative agriculture products and practices, such as organic farming and exotic plant and animal production, are becoming an important component in North American agriculture. Due to the expansion and domination of large agribusiness corporations, small farms are unable to remain competitive in both traditional crop production and marketing. However, alternative approaches to growing traditional crops and the production of new or exotic species not currently grown on a large-scale commercial basis in the USA can provide a greater return on small farms investment compared to traditional products and practices. In areas such as southern West Virginia, with economic instability due to the transition from an industrial and forestry based economy to a service and technology based economy, income from small farms could provide an important source of income for landowners in these regions. An alternative to conventional crops and practices will help develop new and niche markets for plants and animals in high demand but limited supply. Other potential areas of alternative production include organic farming, ornamental and herb production, and hydroponic plant production.

a) Results:

- Liedl, B. E., J. Bombardiere and J. M. Chatfield. 2006. The fertilizer potential of liquid and solid effluent from thermophilic anaerobic digestion of poultry waste. In press: *Water Science and Technology*, **paper**.
- Liedl, B. E., J. Bombardiere, A. Stowers, K. Mazzaferro, and J. M. Chatfield. 2005 Liquid Effluent from Thermophilic anaerobic digestion of poultry litter as a potential fertilizer. American Society of Horticultural Science Annual Meetings, Las Vegas, NV, **oral presentation**.

- Wilfong, K., C. Taylor, K. Mazzaferro and B. E. Liedl. 2006. Hydroponic cucumber production using liquid effluent from poultry waste bioremediation as a nutrient source. Association of Research Directors, Inc. 14th Biennial Research Symposium, Atlanta, GA, April 2006, accepted for poster presentation.
- Subcontract from a USDA-OREI project entitled "The Organic Seed Partnership" with Cornell will fund organic variety trials with WV farmers for the next two years.

b) Successes Resulting in Change (Outcomes):

1) WV farmers are involved with organic variety trials as part of the "Organic Seed Partnership"
2) Maryland Department of Agriculture and the Chesapeake Bay Foundation attended a special meeting with WVSU staff. Results from fertilizer experiments using digested poultry manure. These groups are considering waste management options for poultry farmers in Maryland and nutrient management implications.

Stakeholder Benefits (Impacts): A digester engineering firm has used the results of this research to forecast the economic value of the liquid and solid effluent from proposed commercial digesters.

c) Assessment of Accomplishments: The projects are progressing and should be continued.

d) Source of Expenditures & Impact Scope:

Funding Source-

1. Evans-Allen (section 1445) 2003-2005
2. Bioplex Phases 4 & 5 2004-2005
3. USDA OREI-OSP subcontract from Cornell 2004-2007

Scope of Impact- State, Regional, National, International

Program 1.3: Aquaculture

***Project 1**: Aquaculture: Utilization of Protein from Thermophilic Anaerobic Digestion of Poultry Wastes in Fish Diets*

Description: Effluents from thermophilic anaerobic digestion include significant amounts of microbial protein that can be used as a potential feedstock. Since the cost of feed represents one of the highest costs for the aquaculture industry, efforts to improve feed efficiency are necessary for continued economic growth. Furthermore, feeds with proper nutritional characteristics will ultimately be more environmentally friendly. The objective of this project is to determine if microbial protein, recovered from the digester may be feasibly used as a supplement in fish feeds. The experimental goals were to determine the feasibility of utilizing recovered protein from treated poultry wastes as dietary supplement of rainbow trout and to establish acceptable and optimum dietary levels of recovered protein from treated poultry wastes as dietary supplement of rainbow trout.

a) Results: Feeding trials for the evaluation of protein from the anaerobic digestion of poultry litter was suspended because of 1.) Inability to generate low fiber protein

from digester solid effluent 2.) High levels of chlorine in the water which exceeds the chlorine tolerance of finfish.

b) **Successes Resulting in Change** (Outcomes): This work has generated broad interest in the aquaculture research circles. At various professional meetings, several scientists have requested information to attempt related experiments in their aquaculture production systems. A stakeholder (Mid-Atlantic Technology Research and Innovation Center) specializing in biotechnology development has agreed to evaluate more economic ways to concentrate and purify microbial protein from anaerobic bioreactors.

c) **Stakeholder Benefits** (Impacts): No impacts to report at this time.

d) **Assessment of Accomplishments**: The project is successfully progressing and will be continued.

e) **Source of Expenditures & Impact Scope**:

Funding Source-USDA/ CSREES Federal Administration Research Grant, Evans-Allen (Section 1445)

Scope of Impact**-** State-specific, 1890 Research

***Project 2**: Aquaculture Waste Control and optimizing Nutrient Utilization through Diet Composition and Feeding Strategies*

Description: WVSU is developing aquaculture related research that addresses fish feed efficiency while minimizing pollution thereby effectively controlling waste associated with aquaculture production. The objectives of this program is to determine the effects of feeding practices on waste load in trout culture systems and determine the effects of dietary supplementation of various zeolites on growth, feed efficiency and health of rainbow trout.

a) **Results:**

Publications:

1 "Effect of Diet and strain on growth and performance in hybrid bluegills" and was published in the North American Journal of Aquaculture (North American Journal of Aquaculture 66: 312-318, 2004).

2 Three manuscripts are in preparation and they are as follows:

Eya, J.C. 2005. Effects of Zeolites (BENTONITE) on the Performance of Juvenile Rainbow Trout.

Eya, J.C., A. Parsons, I. Haile and P. Jagidi. 2005. The impact of feeding strategy, dietary phosphorus and varying protein/fat contents on juvenile rainbow trout growth performance and waste output.

Eya, J.C., A. Parsons, I. Haile and P. Jagidi. 2005. Comparison of the Effects of Various Kinds of Zeolites on Growth, Body Composition, and Waste Output in Juvenile Rainbow Trout *Oncorhynchus mykiss*.

3 Two papers were presented at Aquaculture America 2005, New Orleans, Louisiana. January 2005.

b) **Successes Resulting in Change** (Outcomes): Partnerships were established between scientists at WVSU, and the USDA Agricultural Research Service. Drs. Chhorn Lim and Ahmed Darwish, USDA Agricultural Research Service, are collaborating with WVSU on a project that was submitted for extramural funding. Dr. Lim is a renowned fish nutritionist who has worked at the USDA Aquatic Animal Health Research Unit for several years investigating the role of nutrient/disease interaction. Dr. Darwish is a fish pathologist and research microbiologist at Stuttgart National Aquaculture Research Center and has worked on the histopathology and pathogenesis of some fish diseases. This project will create a partnership between the USDA cooperators, Drs. Lim and Darwish, and the WVSU that will strengthen and enhance the programs at both institutions.

c) **Stakeholder Benefits** (Impacts): No impacts to report at this time.

d) **Assessment of Accomplishments**: The project is progressing and should be continued.

e) **Source of Expenditures & Impact Scope**:

Funding Source- Evans-Allen (Section 1445)

Scope of Impact- State-specific, Integrated 1890 Research & Extension, 1890 & 1862 Collaboration

Program 1.4: Plant Genomics

Project 1: *Plant Genomics Evaluation, Enhancement and Breeding of Greenhouse Tomatoes*

Description: Greenhouse vegetable production is a major industry in the United States. Development of superior cultivars is a never-ending quest. The initial focus will be on greenhouse tomato cultivar development. North American greenhouse tomato consumption has increased 90 percent. In the US, greenhouse tomatoes now represent 10% of the total tomato production and many industry experts expect it to increase to 30-40%. Part of this increased production could reduce our imports from other countries. In the four-year period from 1993 to 1997, the percentage of greenhouse tomato imports increased 692% from Canada and 379% from the Netherlands. Greenhouse production of hydroponic tomatoes is best with varieties bred for that purpose. Field varieties are used in some locations, but their determinate plant growth habit makes them difficult to preserve over extended growing seasons and they require higher light and lower humidity than greenhouse varieties. In addition, the controlled environmental conditions of greenhouse hydroponic production generate higher yields from the greenhouse varieties than the field varieties. Currently, most of the varieties used in greenhouse hydroponic tomato production are bred for northern European conditions and palate. Even though these plants are grown in North American greenhouses, the European environment selects for plants with a lower light requirement in the winter and a more moderate temperature year round than is found in North America. Thus, while these varieties can produce a crop under our conditions, they are not selected for the North American greenhouse environment or our consumer needs. In production, good management practices and variety choice can limit most insect and diseases problems, except white fly and late blight. White flies are difficult to eliminate with chemical or biological methods. However, germplasm with a broad-

spectrum insect resistance is being developed at Cornell University that would allow development of varieties with resistance to the majority of pests in the tomato crop, including white fly. The other increasingly significant problem in tomato production is late blight caused by *Phytophthora infestans*. Useful sources of resistance have been identified and transferring of the resistance from two sources to cultivated tomato has been accomplished. Field-testing of the late blight resistant material has been done and current work is developing molecular markers to assist in selection for the resistance genes in breeding programs. The goal of this project is to identify promising varieties and develop germplasm to use in hydroponic greenhouse beefsteak tomato production. The tomato varieties developed will assist West Virginia and the southern greenhouse tomato producers to increase their competitive edge in production of tomatoes that require fewer pesticides and are adapted to the North American climate.

a) **Results**: The genetic diversity of many of the lines is unknown, so AFLP gels were run for 64 lines. Information from this can also be used to develop genetic markers in the future. More than two hundred bands from the AFLP analysis were scored. This data will be analyzed via a systematic computer program to identify 24-32 diverse lines to use in screening SSR primers as possible markers on chromosomes 1, 2 and 4. Seeds extracted in 2004 & 2005 have been packaged and inventoried. With the addition of lab space, seed extraction and seed stocks were moved to the lab for better environmental control of the seeds, storage of the chemicals required and better access to water.

b) **Successes Resulting in Change** (Outcomes): This work is in the process of developing to the extent it can be translated to extension or outreach programs. However, public presentation of the research and establishment of collaborations with WV farmers or growers and other researchers has made institutional endeavors better known to WV farmers/growers and the scientific community.

c) **Stakeholder Benefits** (Impacts): No impacts to report at this time.

d) **Assessment of Accomplishments**: The project is progressing and should be continued.

e) **Source of Expenditures & Impact Scope:**

Funding Source- Evans-Allen (Section 1445)
Scope of Impact- State, Regional and National

Project 2: *Development and Characterization of Molecular Markers for Genetic Improvement of Pepper and Watermelon*

Description: The application of DNA marker technology for genetic improvement of pepper and watermelon is essential for genetic mapping and for manipulating the genes that control the agriculturally important traits. This research focuses on building extensive genomic resources for these crops and identifying diverse germplasm with pest/disease resistant and nutraceutical genes. These germplasm lines will be used in further breeding programs. Genetic maps are developed using AFLP markers. The segregating population used in this study is derived from a biparental cross of the

multiple pest-resistant cultivar Excel and the susceptible parent SC 1149-19. AFLPS are developed from *Hind*III*, Pst*1 and *Mse*1 combinations. AFLP scoring is in progress. The final Genetic Map will be integrated with the phenotypic data for identification of Quantitative trait loci. Microsatellite-enriched libraries are prepared for cotton (*Gossypium barbadense L).*From this library, 96 SSR markers are identified from the sequence data and primers are designed for the amplification of these microsatellites. AFLP markers are developed for cotton RIL (recombinant inbred lines) population derived from a cross between *Gossypium barbadense* and *Gossypium hirsutum*

a) Results: SSR markers are being developed for sweetpotato, pepper, and watermelon. A sweetpotato genetic map is being constructed using 1600 AFLP markers.

b) Successes Resulting in Change (Outcomes): The molecular markers developed in this project will be useful for making genetic maps and also saturating the existing genetic maps to isolate the important disease resistant and quality traits. Several research groups are interested in using these molecular markers in their ongoing research programs. Not many groups are working on development of these kinds of markers (SSRs).

c) Stakeholder Benefits (Impacts): No impacts to report at this time.

d) Assessment of Accomplishments: The project is progressing and should be continued.

e) Source of Expenditures & Impact Scope: Funding Source- Evans-Allen, USDA/CSREES
National and International level genomics research

Goal 4: To achieve greater harmony between agriculture and the environment….

Executive Summary: West Virginia's natural resources are extremely important to the state's economy. To that fact, research efforts underway at WVSU are exploring efficient and economical methods to lessen and remediate the impact of extractive and agricultural industries. The development of novel methods of heavy metal remediation in streams and rivers will provide more efficient and cost effective alternatives for extractive industries. With the reduction of carbon dioxide being a key critical environmental issue, new carbon sequestration studies are focused on the capture and conversion of carbon dioxide into a fuel or feedstock. Increasing production of agricultural waste associated with farming activities impacts, health, economic and environmental welfare. The "Bioplex" project is comprised of several research projects involving the utilization of agricultural waste and thermophilic anaerobic digestion. Innovations and developments resulting from these studies will result in both more efficient and commercially viable digesters.

(A) These projects have produced oral or poster presentations and publications at local, national and international scientific or government venues.

(B) The agricultural waste remediation project has developed a website with information about the projects specific research findings and an overview of current AD technology and economic impacts.

(C) Resource Allocation: **Total Invested:** $ 1,121,504
Formula Funds: $ 454,624
SY: 9.00

Program 4.1: Natural Resource Management

Project 1: Development and Photophysical Investigation of a Heterogeneous Carbon Dioxide Reduction Photocatalyst

Description: Reduction of carbon dioxide is a critical environmental issue. A key component to this research is carbon sequestration and recycling. This project addresses the capturing of carbon dioxide. However, it takes it a step further in the attempt to minimize environmental and geological impact. Not only does this project capture carbon dioxide, it will utilize solar energy to convert it into a useful fuel or a chemical feedstock. Instead of disposing of carbon dioxide waste into a geological landfill, carbon dioxide will be recycled using a free and natural energy source.

a) **Results**: Currently work involves the synthesis and purification of the ruthenium and iridium monometallic starting materials.
- An oral presentation was given at the 2005 Annual WVSU Research Symposium, Institute, WV.

b) **Successes Resulting in Change** (Outcomes): This work has been recognized by WV government officials interested in economic development opportunities that may come out of this research program.

c) **Stakeholder Benefits** (Impacts): No impacts to report at this time.

d) **Assessment of Accomplishments**: This research project is progressing well and will be continued.

e) **Source of Expenditures & Impact Scope**:
Funding Source- Evans-Allen (Section 1445)
Scope of Impact- State-specific, 1890 Research

Project 2*:* Aqueous Metal-Ion Complexation

Description: Metal-ion presence or contamination in water sources is a world-wide problem whose solution has received considerable attention. A common method of removal of the metals from water involves the complexation of the metal ions with soluble ligands such as EDTA, a homogenous method. The metal-ligand complex then has to be removed from the water. The goal of this research is to develop water-soluble ligands that are supported by an insoluble inorganic support, such as alumina or silica. The major advantages sought here include, the use of high concentrations of ligands thus significantly increasing the capacity for metal complexation, and the ease of disposal of the supported ligand-metal complex from water.

a) **Results:** Product was a water-soluble pale yellow paste. The paste however contains side products resulting from the quenching of LiAlH4 with methanol. Extraction in ethanol and product isolation and characterization using 31P NMR points to the formation of the sought after water-soluble diphosphine. However, there was also some either starting material or oxidation product present. The reaction was repeated using 6M HCl to quench the excess LiAlH4. The final product, from 31P NMR data contained several phosphorus-containing compounds. This is a result of several side reactions occurring, an observation that has been noted in the literature for some of this class of reactions.

b) **Successes Resulting in Change** (Outcomes): This work is not sufficiently mature to show outcomes beyond research results.

c) **Stakeholder Benefits** (Impacts): No impacts to report at this time.

d) **Assessment of Accomplishments**: This research project is progressing well and will be continued.

e) **Source of Expenditures & Impact Scope:**
Funding Source- Evans-Allen (Section 1445)
Scope of Impact- State-specific, 1890 Research

Program 4.2: Agricultural Waste Management

***Project 1**: "**Bioplex"** (Application of Microbiology & Related Techniques on Waste Management and Environmental Remediation)*

Description:
Increasing production of agricultural waste associated with farming activities impacts health, economic and environmental welfare. The Bioplex program at WVSU comprises several research projects involving the utilization of agricultural waste and thermophilic anaerobic digestion. The objectives of these projects in 2004 were:
1) Utilize the pilot plant digester located on campus to study its capacity to be controlled using biochemical parameters known to be effective. We propose to test the effect of temperature control strategy, frequency of feeding, and organic overloads on digester performance. Our control and monitoring software will allow us to use the results of the proposed experiments to develop computer control software for the pilot plant based on real-time feedback of pH, temperature, and biogas composition and production. Assessments of both mass and energy balance of the process will be included in these experiments.
2)) The reduction in pathogens during digestion will be studied, with historic emphasis on *Escherchia coli*, *Salmonella*, fecal streptococci, *Cryptosporidium*, *Giardia* and *Ascaris* species. We propose to set up experiments in a manner that we can evaluate pathogen kill over time and demonstrate that the material remaining after known incubation times (equivalent to digester resident time) is not viable. The viability assays will be essential to verify that the stated conditions are an effective means to destroy specific pathogens. An independent assessment of this experiment will be provided by Waterborne Inc., New Orleans, LA.

3) The commercialization of anaerobic digester technology and outreach of this information will focus on defining the economics of recycling the carbon and nutrients in a specific agricultural region. Currently, handling the biogas and end use of the liquids and solids are major hurdles in making this technology economic. Ongoing experiments address both components by evaluating biogas purification alternatives, fate of pharmaceuticals in digested materials, and the effect of liquid `land-application on soil nematode populations and the use of digested solids for carbon filtration.

4) The organic materials resulting from thermophilic anaerobic digestion are known to have biological value. Several years data on the accumulation and depletion of various crop nutrients has allowed us to propose recommended practices for the use of digested, poultry-litter solids and liquids as replacements for commercial fertilizers. Tomatoes, potatoes and broccoli will be utilized as test crops to demonstrate nutrient management practices when land-applying combinations of digested, poultry-litter liquids and solids. These digested solids and liquids will be compared to both chemical fertilizers and certified organic fertilizers that are formulated specifically by crop recommendations that are based on soil analyses. Cucumbers, lettuce and spinach will be grown in two hydroponic production systems to evaluate the effects of liquid effluent as a nutrient solution versus a commercial nutrient solution.

a) Results:

1) Operational parameters of the pilot thermophilic anaerobic digester. Three pilot plant experiments were conducted last year. The first experiment was a continuation of the feed frequency experiment initiated in the fall of 2004. Four feed loading frequencies were compared; 1 feed event per day, 2 feedings per day, 6 feedings per day, and 12 feedings per day. The total feed volume and concentration for each treatment was 240 gallons per day at 50,000 ppm COD. Biogas production was greatest at frequencies 2 and 6, while stability of operation was greatest at frequencies of 6 and 12 feed events per day. The results were similar to the 2004 experiment. An abstract has been submitted for presentation and publication in 2006. The second experiment compared different temperature control strategies at 134 °F. The treatments included deadbands (deviations from temperature before heating) of 0.2, 0.6, and 1 °F. Biogas production was greatest at the 1 °F deadband, however energy consumption was also highest. No differences in energy consumption or biogas production were seen between the 0.2 and 0.6 °F deadbands. The final experiment tested digester stability during organic loading shocks. Acetic acid was added to the system in two doses, 5 and 15 gallons, and the system was fed a 1,000 gallon dose over 15 minutes in addition to the normal feeding regime. Data from these experiments is currently being analyzed.

2) Monitoring the Loss of Viability of Pathogens in Livestock Residuals. Experiments characterized the viability of both *Giardia muris* and *Cryptosporidium parvum* in both thermophilic (55 degrees C) and mesophilic (37 degrees C) digester environments. Vital staining techniques and rodent infectivity experiments were conducted. Dye exclusion assays indicate plus 99% loss of viability for *Giardia lamblia* at thermophilic temperatures. No rodents were infected in samples

incubated in digester fluid at the thermophilic, mesophilic or ambient temperature. The small oocyst of *Cryptosporidium parvum* limited the usefulness of dye exclusion techniques. However, no rodents were infected in samples incubated in digester fluid at thermophilic temperature, but rodents were positive for samples incubated in phosphate buffered saline at thermophilic temperatures. This work indicates that for at least *Cryptosporidium parvum,* the thermophilic temperature and the anaerobic digestive process are critical in inactivation of the organism. In general, the research supports that thermophilic process is superior to similar methods using mesophilic temperatures.

3) **Commercialization and outreach of Anaerobic Digester Technology**. Several activities occurred in 2005 to promote the commercialization anaerobic digestion for poultry litter. A website was developed with general and technical information about the digestion of poultry litter, including research reports and publications from the Bioplex Project. The site can be viewed at http://bioplexproject.wvstateu.edu. In December, a presentation and tour was facilitated by WVSU for members of the Maryland Department of Agriculture and NRCS as well as a member of the Chesapeake Bay Foundation. The group toured the Bioplex pilot-plant and greenhouses. Presentations focused on the feasibility of anaerobic digestion of poultry litter on Delmarva and implications on nutrient management. Three end-use effluent experiments were concluded. The first tested digested poultry litter solids as a carbon filter for heavy metals. Digested solids were compared to raw poultry litter and common carbon filtration material (coal, wood, minotaur). The tests were conducted by Dr. Isabel Lima at the ARS laboratory in New Orleans, LA. Results indicate the digested solids are less effective than raw poultry litter for carbon filtration of metals; Ni, Cu, Zn. Therefore this research has been terminated. The second compared the effects of digested liquid to urea on soil nematode populations. The trial was conducted in a hay and corn fields in Mason County, WV. Dr. James Kotcon analyzed soil samples taken from the plots at different times throughout the growing season. There is very little evidence that the treatments had a significant effect on soil nematodes, either plant parasites or free-living species, other than the very typical increase in bacterial feeders that occurs whenever organic matter is added to soil. Digested solids were also tested as a substrate for mushroom cultivation. Dr. Omon S. Isikhuemhen of North Carolina A&T State University prepared different substrates to be tested on the campus of WVSU. Preliminary tests with digested solids indicated the solids are appropriate for some varieties such as oyster mushrooms, but are not suitable for other varieties such as shitake. An abstract of this work has been submitted for presentation and consideration for publication in 2006. The first fruiting trial comparing ten different mixtures of digested solids and wood/straw for oyster mushroom cultivation just concluded. Trails will continue through the spring of 2006.

4) **Evaluating digester effluent as organic fertilizer and developing production systems.** Field trials continued to test the efficacy of liquid effluent as an alternative fertilizer to organic or synthetic chemical products. Potato fresh weight and tuber number was statistically significantly for plots treated with the 2x liquid effluent

treatment compared to the 1x liquid effluent, chemical or organic fertilizers. Liquid effluent applied at twice the recommended nitrogen rate was statistically the same as the commercial fertilizer for both marketable number of fruit and marketable fruit weight. The 2x effluent treatment produced 3 times the number of extra-large tomatoes compared to the conventional, organic and 1x effluent treatments. The fertilizer treatments for the spring broccoli crop showed statistical difference with the 2x treatment being the best, 1x and chemical tied for second and organic in third. The fall broccoli trial showed a fertilizer effect, but there was not difference between the four fertilizer treatments and the marketable weight was considerably less than was observed in the spring. Blueberries did not show any fertilizer effect and this may be due to the fact it is a perennial crop. Beit alpha cucumbers were grown hydroponically to evaluate the effects of liquid effluent as a nutrient solution versus a commercial regime. Average fruit weight and number of fruit produced was statistically significant between the two fertilizer regimes with the commercial fruit averaging 84 g compared to 75 g for plants fertilized with effluent. However, the effluent treatment produced a greater percentage of grade 1 fruit (33%) compared to the commercial treatment (26% grade 1 fruit). Trials comparing fertilizing seven lettuce varieties with liquid effluent versus a commercial fertilizer regime were completed. Shoot fresh weight was not statistically significant between the two fertilizer regimes for any of the seven varieties. In three varieties, the number of leaves was statistically significant for the commercial fertilizer treatment over the effluent. A trial of hydroponic spinach was also attempted, but the commercial treatment died in the third week of the trial from excess iron in the fertilizer. In addition, growth of the plants was hindered in all of the effluent treatments. In the spring a second spinach trial will be conducted.

Posters, Publications and Presentations:

1. Bombardiere, J., T. Espinosa-Solares, M. Domaschko, F. Robles-Martínez, M. Chatfield. Influence of temperature on methane production from poultry litter in a pilot plant biodigester. 7th IWA Specialty Conference on Small Water and Wastewater Systems Mexico City, Mexico, March 2006, **accepted for oral presentation**.
2. Bombardiere, J., T. Espinosa-Solares, M. Chatfield, M. Domaschko, M. Easter, D. A. Stafford, S. Castillo-Angeles, N. Castellanos-Hernandez. 2005. Influence of hydraulic retention time on the performance of a pilot plant thermophilic anaerobic bioreactor. 4th International Symposium on Anaerobic Digestion of Solid Waste, Copenhagen, Denmark, **poster presentation**.
3. Espinosa-Solares, T., J. Bombardiere, M. Chatfield, M. Domaschko, M. Easter, D. A. Stafford, S. Castillo-Angeles, N. Castellanos-Hernandez. 2005. Macroscopic mass and energy balance of a pilot plant anaerobic bioreactor operated under thermophilic conditions. Bioresource Technology Conference, Denver, CO, **poster presentation**.
4. Espinosa-Solares, T., J. Bombardiere, M. Chatfield, M. Domaschko, M. Easter, D. A. Stafford, S. Castillo-Angeles, N. Castellanos-Hernandez. 2005. Macroscopic mass and energy balance of a pilot plant anaerobic bioreactor operated under thermophilic conditions. Bioresource Technology, **paper**.

5. Isikhuemhen Omoanghe S., Olena Shulga and Mark Chatfield. 2006. Preliminary Studies on the Use of Solid Waste from Anaerobic Digestion of Poultry Litter in Mushroom Cultivation. Association of Research Directors, Inc. 14th Biennial Research Symposium, Atlanta, GA, April 2006, **accepted for poster presentation**.
6. Ruhnke, T. R., V. Carrasco and J. McCormick Removal of protozoan and helminth pathogens using Thermophilic Anaerobic Digestion. Association of Research Directors, Inc. 14th Biennial Research Symposium, Atlanta, GA, April 2006, **accepted for poster presentation**.

b) **Successes Resulting in Change** (Outcomes): The Bioplex Project has demonstrated the performance and stability of anaerobic digesters fed poultry litter, the value of digested liquids and solids for soil amendments and hydroponic crop production, the level of pathogen destruction obtained during digestion, and the fate of hormones through the digestion process. Presentations and site tours have been conducted to departments of agriculture in three states considering anaerobic digestion of poultry litter

c) **Stakeholder Benefits** (Impacts): Poultry litter digesters are being constructed on farms in Louisiana and Ontario, Canada in part because of information and site tours provided by the West Virginia State University Bioplex Project.

d) **Assessment of Accomplishments**: The WVSU Associate Director of 1890 Research (Dr. Chatfield) is responsible for assessments. Dr. Chatfield is also research director for this project. He feels it is progressing and should be continued.

e) **Source of Expenditures & Impact Scope**:

Funding Source- Evans-Allen (Section 1445), USDA/CSREES

Scope of Impact- State-specific, 1890 Research

SECTION III
West Virginia State University Extension
(1890 Extension Programs)

Table 1 WVSU Extension: Resource Allocation Summary (*by Goal and Program*)

WVSU EXTENSION PROGRAMS

ANNUAL ALLOCATION OF RESOURCES *(FY 2005)*								
NATIONAL GOAL / INSTITUTIONAL PROGRAM		FUNDING SOURCE						
Goal	*Program Area*	*Federal Formula*	*Federal Other*	*State Match **	*State Other*	*Other*	*TOTAL*	*FTE*
GOAL I								
Program 1.1	Alternative Agriculture Extension and Education	30,000	29,144	9,000	0	10,000	*78,144*	0.25
Program 1.2	The Expansion of Horticultural and Forestry Activities in West Virginia	37,781	0	11,334	0	0	*49,115*	0.5
Program 1.3	Production Agriculture Education	15,000	0	3,500	0	0	*18,500*	0.25
Program 1.4	Youth Agriculture Education	5,000	10,000	2,000	0	0	*17,000*	0.25
	Total	**87,781**	**39,144**	**25,834**	**0**	**10,000**	***162,759***	***1.25***
GOAL II								
Program 2.1	Food Safety	65,000	0	13,000	0	0	*78,000*	2.00
Program 2.2	Food Security	15,000	0	2,839	0	0	*17,839*	0.25
	Total	**80,000**	**0**	**15,839**	**0**	**0**	***95,839***	***2.00***
GOAL III								
Program 3.1	Nutrition Education and Wellness System	166,983	13,633	55,104	22,877	39,794	*298,391*	2.25
	Total	**166,983**	**13,633**	**55,104**	**22,877**	**39,794**	***298,391***	***2.25***
GOAL IV								
Program 4.1	Environmental Conservation Education	15,000	0	2,000	0	0	*17,000*	0.25
	Total	**15,000**	**0**	**2,000**	**0**	**0**	***17,000***	***0.25***
GOAL V								
Program 5.1	Youth Development	162,599	45,040	73,169	18,598	61,700	*361,106*	5.50
Program 5.2	Community and Economic Development	151,330	402,985	60,532	0	20,000	*634,847*	3.50
Program 5.3	Minority Business Affairs	11,365	0	4,442	0	0	*15,807*	0.25
Program 5.4	Technology and Literacy Education Programs	75,050	0	25,000	0	29,680	*129,730*	3.00
Program 5.5	Rural Business Services	111,365	71,133	42,283	61,386	24,000	*310,167*	2.00
Program 5.6	Family Education	152,900	0	68,805	0	2,000	*223,705*	3.00
	Total	**664,609**	**519,158**	**274,231**	**79,984**	**137,380**	***1,675,362***	***17.25***
	GRAND TOTAL	***$ 1,014,372***	***$ 571,935***	***$ 373,009***	***$ 102,861***	***$ 187,174***	***$ 2,249,351***	***23.00***

***** *State match appropriations spent between October 1, 2004 thru June 30, 2005*

WVSU Extension Overview

Extension and outreach programs are currently offered on a consistent basis in approximately 15 counties within West Virginia. These programs were specifically designed to meet the needs of our target audiences and communities, categorized as underserved and underrepresented. Community environmental scans and stakeholder sources assist our staff in designing new programs and redesigning existing ones to more effectively serve the needs of our target audiences (clients). In 5 years of service, many of these programs have already had a profound impact on those individuals and communities we serve. As state and other federal and non-federal sources of funding are secured, opportunities for the institution to expand its extension and outreach programs to other communities will be assessed. The following section presents a description of all the activities undertaken and the impacts they had on the communities and stakeholders served in FY 2005. Table 2 summarizes the funding invested in each goal and program of the institution's plan of work for fiscal year 2005.

GOAL 1. *An agricultural system that is highly competitive in the global economy*

Executive Summary: West Virginia has the highest percentage of family operated farms in the country. Individuals and their families operate 96.4% of all farms in the state. In addition, more than 400 agri-businesses contribute an estimated $100 million in revenue to the state of West Virginia on an annual basis. Small farm operations face constant pressure to increase the quality of their product and make their operations more profitable. Since July 2003, WVSU has addressed these needs by placing an Agriculture and Natural Resources Extension Agent in a county office. Also, residential horticulture and pest control are increasing areas of interest throughout West Virginia and across the country. The increased awareness of horticulture and pest control has prompted WVSU to respond in July 2004 by placing an Extension Agent for Agriculture and Natural Resources with a multi-county assignment in the development of community and youth gardening efforts.

Total Invested -	Total Funds:	$ 162,759
	Formula Funds:	$ 87,781
	FTE:	1.25

Extension Program 1.1 *"Alternative Agriculture and Extension Education"*

Roane County Calf Pool

a) **Description**: The United States Department of Agriculture Economic Research Service (USDA/ERS) showed that one of West Virginia's top livestock products annually is beef cattle. To address the needs of this constituency for greater return on their investment, West Virginia State University has partnered with the citizens of Roane County and operated the Roane County Calf Pool for the last three years in cooperation with local agriculture interests and the West Virginia University Extension Service.

b) **Outputs:** The Extension Agent helped to coordinate Roane County's Calf Pool program. This local effort creates an opportunity to increase the market value of cattle sold in the pool. Seventeen local producers took part in this year's effort and marketed 235 cattle at above average market prices.

c) **Outcomes:** The pool produced $147,909.70 in revenue for local producers.

d) **Impact:** Increasing market value of an animal will result in more profit for producers in the local agriculture industry.

e) **Funding Source:** Federal and State

Scope of Impact: County and State-specific

Extension Program 1.2 *"The Expansion of Residential Horticulture Activities in West Virginia"*

Pesticide Applicator Re-Certifications

a) Description: Residential horticulture and pest management issues continue to be the most desired service provided by West Virginia State University Agriculture and Natural Resources Agents. From questions as simple as handling residential lady bug infestations to more complicated natural invasive plant and pest management, Agriculture and Natural Resource Extension Agents play a prime role in the delivery of research-based knowledge to the citizens of their counties. Primary delivery methods include fact sheet distribution, newspaper articles, and appearances on local radio. They are also responsible for the development of the research involved in delivering information and solutions. The extension agent can be an identifier of horticulture problems and then develop research to find applicable answers. Roane County alone has two registered nurseries and numerous unregistered nurseries. It also has four nursery dealerships within the county.

b) Outputs: The Extension Agent visited many Roane County residents' homes/farms for observations, interpretations, diagnostics, and explanations on plant diseases, insect problems, irregular plant growth, and livestock health. The Extension Agent averaged twenty-five calls or information requests per week on local agricultural issues. Roane County newspaper articles provided diversified agricultural information to more than 5,900 people per printing. These articles were submitted every other week until October 2005 and then every three weeks. The Extension Agent also presented the Pesticide Recertification Class for three Roane County residents. Three Roane County residents are more knowledgeable on pasture management, beef cattle parasite control, weed identification and eradication, West Nile disease prevention, and record-keeping.

c) Outcomes: The three Pesticide Recertification participants had a 17% increase on their average score from the pre-test to the post-test covering the topics of pesticide application techniques, safety, respirator awareness, and general pesticide use.

d) Impacts: The Pesticide Recertification classes provide essential information on the proper use of restricted pesticides and herbicides. Without these classes people could possibly contaminate the water supply or kill all types of forages in pasture grounds causing livestock to be confined inside and the producer to buy hay for animals.

e) Funding Source- Federal and State allocations
Scope of Impact- State and county specific

Grafting Workshop

a) Description: Grafting is a technique used by many nurseries and private orchard growers to cultivate different types of apples on a single host tree. This technique helps with pollination and allows variety in very little space.

b) **Outputs:** The Extension Agent organized a grafting workshop featuring Bob Wilson, a local expert, to teach Roane County residents how to properly graft trees. All of the participants were allowed time and instruction to actually graft onto a live tree.

c) **Outcomes:** Participants have an increased knowledge about fruit tree care and grafting techniques.

d) **Impact:** There were a total of fourteen people in attendance for the workshop. These producers have been able to implement effective pruning techniques which saves time and money spent on inadequate or improper pruning.

e) **Funding Source:** Federal and State allocations
Scope of Impact: State and county specific

Extension Program 1.2: "*The Expansion of Horticultural and Forestry Activities in West Virginia"*

4A Pesticide Certification

a) **Description:** Within forestry and horticulture professions, training on proper pesticide handling and application is mandated by state government. The West Virginia Department of Agriculture, Pesticide Division serves the population by offering numerous free trainings on such topics, but its location at the Guthrie Agricultural Center has made it inconvenient at times to accommodate large trainings. In cooperation with the Department of Agriculture, West Virginia State University (WVSU) Extension has provided a location for various trainings acting as the host to an event. Not only does this cooperation benefit the Pesticide Division, but it also has proved to be beneficial to the University as well. WVSU Physical Facilities grounds maintenance employees and students involved in the agricultural research at Bioplex have all been trained by the Department of Agriculture Pesticide Division on proper pesticide application and handling.

b) **Outputs:** A 4A Recertification Training, which involves regulations on lawn care and turf grass management, was hosted by the Department of Agriculture in conjunction with WVSU on January 13th of 2005. Typically, this training is offered only in the northern region of the state, making it difficult for participants in the southern region of the state to attend. The training recertified 64 people in 4A Protection Standards in a more convenient, centrally located area. Ten members of West Virginia State University's Physical Facilities grounds maintenance employees and student laborers were included.

c) **Outcomes:** Pesticide training increases knowledge of proper handling and application of a chemical and decreases the potential for improper use or injury due to negligence. The WVSU Physical Facilities ground maintenance employees and student laborers gained certification and increased awareness of proper practices that they can utilize not only for the proper maintenance of our beautiful campus, but also as a means of professional development.

d) **Impact:** The cooperation between the Department of Agriculture and West Virginia State University has increased the number of individuals trained on proper pesticide management. This has also increased the participation of businesses in the southern regions of the state and allowed them to remain in compliance with

the laws that restrict pesticide application in the lawn care and turf grass management fields.

e) Funding Source: Federal and State allocations
Scope of Impact: County

Urban Forestry

(a) Description: Urban forestry is a specialized branch of forestry that includes planning, designing, establishing, maintaining, regulating, treating, conserving, and protecting woody vegetation in urbanized areas. Because of its similarities to horticulture, landscape architecture, and park management, our staff works in concert with professionals in these fields as well as with the West Virginia Division of Forestry, city planners, and various community organizations to develop the program. In the immediate service area, 80% of the residents live in urban and/or suburban areas. Statewide, this figure is 62%. In these urban areas, healthy trees enhance the environment by promoting clean air and water, increasing property values, reducing erosion and storm water runoff, providing wildlife habitat, moderating temperature, and offering year-round enjoyment. The Urban Forestry Extension Program is an educational outreach network that focuses on areas such as tree care and maintenance, ecology, and economics through the education of citizen groups, children, professionals, municipalities and agencies.

(b) Outputs: Coordinated development of the West Virginia State University (WVSU) urban forestry extension programs with existing programs run by the WV Division of Forestry Urban Forestry staff and the State Office of the Division of Forestry has assisted in furthering program development. The WV Division of Forestry State Office provided training on the Project Learning Tree (PLT) curriculum. This program has been developed to educate youth about the environment and local and global environmental issues. This training was provided on the WVSU campus as part of an Ag in the Classroom initiative, in conjunction with three other curriculum trainings.

(c) Outcomes: The partnership between WVSU and the Division of Forestry has allowed for an increase in the dissemination of information about urban forestry to the public. By providing support to the efforts of the Urban Forestry Division, programs have been able to continue when state funding was at a minimum. Numerous teachers and volunteers have benefited from this cooperation by acquiring the needed training and supplies to teach youth about proper management of trees. Twenty participants took part in the PLT Training session. Additionally, 75 trees were planted across the state of West Virginia due to the Arbor Day project.

(d) Impacts: As a result of this interaction, teachers and volunteers have been introduced to an environmental curriculum that they may utilize in their own classrooms or volunteering efforts. Long-standing programs, which have in the past been supported by the Division of Forestry, were able to continue even when budget cuts took place, due to the support of West Virginia State University. This cooperative effort has opened the door for further coordination of programs and projects.

(e) Funding Source: Federal and State allocations
Scope of Impact: State and County specific

Community Gardens

a) Description: The need for a community garden program was identified during an initial needs assessment of the Charleston Housing Authority. Through existing partnerships with the Charleston Housing Authority, West Virginia State University (WVSU) Extension became aware of residents' desires to create their own garden plots. Because of lack of organization and limited resources, initial attempts fell short of residents' expectations. In 2005, WVSU Extension Agents took the lead in coordinating a program by organizing resident and community efforts to create a garden at Orchard Manor Housing Community.

b) Outputs: Participants in Orchard Manor community garden were provided a very structured garden atmosphere to learn in and enjoy. WVSU Agents coordinated the construction of the community garden from beginning to end. This success was made possible with the assistance of Lowe's Home Improvement Warehouse of South Charleston, who assisted in the construction phase of the project. Once the participants were allocated garden space, they were allowed to choose which crops they would enjoy growing from a list of available plants. Through hands on interaction the participants learned about topics such as proper plant spacing and disease/pest management via WVSU Agents. Harvest records were kept by the garden participants. At total of 61 people took part in the Orchard Manor Community Garden experience.

c) Outcomes: The Community Garden Program at Orchard Manor succeeded in bringing the community together within the several surrounding Charleston Housing developments. Residents from Carroll Terrace and Little Page traveled to share in the garden experience. The community garden also allowed the participants to interact with management at Lowe's of South Charleston. Together they worked to create the accessible garden plots and construct a walkway leading to the garden gate. The community garden project at Orchard Manor was chosen to compete in the Lowe's Heroes program, a contest between all of the Lowe's stores throughout the nation. The Community Garden Project culminated with a Garden Hose Cutting Ceremony during the Open House for the reconstruction efforts at Orchard Manor. Congresswoman Shelly Moore Capito held the honor of cutting the garden hose to christen the garden. Numerous dignitaries were on hand for the event, as well as local television and print media representatives.

d) Impact: The overwhelming response to the Community Garden at Orchard Manor has led to a second community garden partnership among the same partners, the Charleston Housing Authority and Lowe's of South Charleston. The second garden will service Charleston Housing residents as well as provide a beautiful addition to the scenic Historic District of Charleston's East End. At this time, 14 corporate sponsors are on board for this new garden.

e) Funding Source: Federal and State allocations, Charleston Housing, Private Industry
Scope of Impact: State and County Specific

Extension Program 1.3: *"Production Agriculture Education"*

Progressive Farmers Meetings

a) **Description**: Information from The United States Department of Agriculture Economic Research Service (USDA/ERS) indicates that West Virginia is the number one state in the country for percentage of family farms, followed by Alabama and Oklahoma. Individuals/families operate 96.4 percent of the Mountain State's farms. To address the needs of this constituency, WVSU Extension has partnered with the citizens of Roane County and placed a full-time Extension Agent in the field of Agricultural and Natural Resources. Roane County is located in central West Virginia with a population of 15,362 residents. Roane County is filled with 538 farms covering a total of 99,078 acres of farmland. West Virginia State University has made a commitment to ensure optimal agriculture education programs within Roane County.

b) **Outputs:** To provide Roane County agricultural producers information, the Extension Agent has formed a Progressive Farmer group. Seven meetings have been scheduled and four Young Farmer meetings have been held. Completed meetings included speakers from various agencies and organizations like the Department of Agriculture Division of Pesticide Regulatory Services, the Roane County Farm Bureau, the Division of Natural Resources Conservation Service in Roane County, and the Smuggling Interdiction and Trade Compliance Operations Office. Discussion topics included a variety of topics like pesticide safety and certification; how to join the Farm Bureau; the Conservation Security Program; and the international threat of Avian Influenza in poultry. The four remaining meetings will include speakers from Premier Feeds, West Virginia University Extension, the Natural Resource Conservation Service, the Farm Service Agency, the Little Kanawha Conservation District, and the West Virginia State Veterinarian's Office. The Extension Agent is responsible for coordinating the meetings and inviting speakers to the Young Farmer Meetings. Forty-four producers and 19 members attended the two December meetings. In January, 34 members attended the two meetings.

c) **Outcomes:** Participants were asked how useful the information provided was and asked to grade it on a 5-point Likert-type scale with 5 being very useful and 1 being not useful. On December 6, 2005, 68% of participants answered the survey and gave an average score of 4.46. On December 15, 2005, 36% of the people in attendance answered the survey and gave an average score of 4.88. On January 12, 2006, 100% of the people in attendance answered the survey and gave an average score of 4.83. On January 19, 2006, 58% of the people in attendance answered the survey and gave an average score of 4.82.

d) **Impact:** Through attending the Progressive Farmer Meetings, Roane County producers are becoming better informed on up-to-date agricultural information and programs.

e) **Funding Source:** Federal and State
Scope of Impact: County and State-specific

Extension Program 1.4: *"Youth Agriculture Education"*

Youth Livestock Program

a) **Description*:*** More and more of West Virginia's youth have no concept of the origination of their food or basic understanding of raising plants and animals. Without this basic understanding, youth are alienated from one of the largest industries in the state. West Virginia must have youth participating in agriculture education to ensure its future. There are a number of opportunities for youth to get involved and learn about agriculture, such as Agriculture in the Classroom, which teaches youth the basic aspects of agriculture; Agriculture Field Day, which brings youth participants on a farm to see, hear, smell, and feel what agriculture is really about; Livestock, Land, and Horse Judging competitions, which are ways for more advanced agriculturally-educated youth to be challenged and expand their knowledge of agriculture in a specialized area of interest; and livestock shows and sales, where youth learn the importance of nutrition, maintenance, grooming, and showing of livestock.

b) **Outputs:** The Extension Agent worked with the 4-H Livestock Club to conduct presentations on livestock nutrition, livestock confirmation, breed selection, showmanship, and the 2005 Rules and Regulations for the Roane County Livestock Show and Sale. The agent visited 4-H homes to give first year participants guidance in the proper care and responsibility of livestock projects. The Roane County Showmanship contest was very competitive because of the participants' increased knowledge in proper handling of the livestock, the overall demonstration, and an abundance of project knowledge. The programs increased the confidence and knowledge of 4-H participants and their parents. The Extension Agent taught livestock show, care and judging at 4-H camp; took the 4-H livestock judging team to compete in the state competition held in Morgantown; prepared youth to compete in the Horse Judging contest; was responsible for developing and implementing the Roane County 4-H Livestock Show and Sale and for developing, coordinating, and implementing the Agriculture Field Day program. Ten youth participated in livestock judging class at 4-H camp. Twenty youth participated in livestock show and care class at 4-H camp. Four youth participated in the livestock judging contest. Three youth participated in 4-H Horse Judging. Seventy-seven of the 92 youth participating in the Livestock Show and Sale were 4-H members. A total of 157 3rd grade students, 23 FFA students, and 18 adult volunteers and teachers attended Agriculture Field Day.

c) **Outcomes:** This year the Livestock Show and Sale brought in $107,129.75 to provide financial assistance for all youth participants to further their educations.

d) **Impact:** The 4-H Livestock Show and Sale program stresses agriculture education by making youth participants the producers of a single agricultural animal. These youth are learning responsibility, livestock nutrition, confirmation, quality assurance, and dedication. The Agriculture Field Day is an opportunity to see what farm life is like and learn about livestock, farm safety, soil and water quality, and horticulture on a farm.

e) **Funding Source:** Federal and State
Scope of Impact: County and State-specific

Extension Program 1.5: *"Junior Master Gardener"*

a) Description: Agriculture plays a major role in the daily lives of residents of West Virginia. In order to educate youth in agricultural topics, WVSU Extension has continued working with schools in Putnam and Kanawha counties to provide Junior Master Gardener training. The curriculum that accompanies this program covers topic areas such as plants, soil, water, insects, environment, and ecology. In many cases these subjects are required to be covered in the classroom during the science instructional time. By working with the teachers at the various grade levels, the Junior Master Gardener program can be incorporated into the classroom as a supplemental resource to the already established science lesson plans.

b) Outputs: Two Junior Master Gardener groups continued from last year at Buffalo Elementary for kindergarten and 4th grade students. During the same time, six other JMG groups were created in Kanawha and Putnam Counties. In Kanawha County, the Piedmont Growth Spurts were established and consisted of 3rd to 5th grade students in the after school program at Piedmont Elementary School. An additional three groups were formed in after school sites located in Washington Manor, South Park, and Little Page Terrace low-income housing communities. These groups included youth ranging from kindergarten through grade six. The Stonewall Jackson Middle School Environmental Generals were developed for youth in 6th through 8th grades. In Putnam County, the Buffalo Elementary Bugs and Critters group was established for 3rd grade students. The 5th grade for the 2005-2006 school year at Buffalo Elementary split into two groups due to the large class size.

c) Outcomes: In all, 245 youth were involved in the program. The students at Buffalo Elementary maintained and incorporated new elements into their established wildlife habitat. West Virginia State University (WVSU) also received the honor of becoming a State Coordinator for the Junior Master Gardener Program in West Virginia. This honor symbolizes WVSU's role in the expansion of the Junior Master Gardener curriculum throughout the state of West Virginia.

d) Impact: Students who participated in the Junior Master Gardener Program learned the importance of being good stewards to our land. Not only were the youth exposed to garden-based activities, but also they learned how to conduct experiments and assess a result. By experiencing something first hand, the students were able to better comprehend topics that they otherwise may have found incomprehensible. Teaching our youth at a young age how to utilize critical thinking and deductive reasoning better prepares them for the world outside of the classroom.

b) Funding Source: Federal and State allocations
Scope of Impact: State and County Specific

Junior Master Gardener Daycare Pilot Program

a) Description: West Virginia State University acknowledges that exposure to agricultural topic areas needs to start as early as possible. Through the newly developed Junior Master Gardener Daycare Pilot Program, youth as young as 2

years old are experiencing activities in topic areas such as plants, soil, water, insects, environment and ecology. Children, in their early stages of development, are like little sponges that pick up every little drop of information. WVSU feels that it is important to incorporate this age group into our youth programming and develop a curriculum gauged at daycare level agricultural education.

b) Outputs: Two Junior Master Gardener Daycare Pilot Programs were established, one in Kanawha County and the second in Putnam County. The Kanawha County Pilot was held at the Discovery Learning Center in South Charleston where children from the ages of 2 years to 5 years old have been participating in activities gauged at increasing their awareness of the environment. The Putnam County Pilot was held at the Teays Valley Child Development Center. The same age group was targeted at the Putnam County site. Both of the programs have been registered as Junior Master Gardener groups with the National Junior Master Gardener Headquarters at Texas A&M University. A total of 87 youth have been impacted by this new daycare initiative.

c) Outcomes: By targeting this age group, WVSU feels that it is being innovative in its approach to agricultural education. The youth are responding well to the program and are able to illustrate what they have learned by the end of the activity. Whether it is the placement of models of the lifecycle of a butterfly in the correct order, or the repetition of the word "metamorphosis" by 3 year olds, the youth are learning these basic concepts. Parents are recognizing the efforts and questioning the daycare providers about the programming. Enthusiasm has also spread to the various daycare teachers involved in the program. These teachers have become more innovative in their activities they present to the youth on a daily basis.

d) Impact: Students who are participating in the Junior Master Gardener (JMG) Daycare Pilot Program are going to have knowledge of topics way beyond their years. Through the daycare experience, children are being taught things that they need to know in preparation for kindergarten. Introducing concepts to children at this age enables them to become familiar with a concept. This, in turn, may increase their ability to comprehend the topic when it is taught to them in the school system.

e) Funding Source: Federal and State allocations
Scope of Impact: State and County Specific

Agriculture in the Classroom

a) Description: Agriculture in the Classroom is a program coordinated by the United States Department of Agriculture with a goal "to help students gain a greater awareness of the role of agriculture in the economy and society, so that they may become citizens who support wise agricultural policies." Funding for this program was received by West Virginia State University (WVSU) for the first time in 2005. By combining efforts with other State supported agencies such as West Virginia's Department of Environmental Protection, West Virginia's Division of Forestry, and the West Virginia Department of Natural Resources, WVSU has been able to educate numerous teachers and volunteers on programs consistent with the goals of the Ag in the Classroom initiative.

b) **Outputs:** The development of the WVSU Ag in the Classroom program has helped to broaden the reach of the program. A two day training on four environmentally based curricula was sponsored by WVSU and held on the University's campus. The WV Department of Environmental Protection provided training on Project Wet, the WV Division of Forestry on Project Learning Tree, the Department of Natural Resources on Project Wild and WVSU Extension on Junior Master Gardener. Twenty participants took part in this two day training session.

c) **Outcomes:** The cooperation that has been developed with the various state agencies was made possible by the Ag in the Classroom funding. This collaboration allowed for an increase in the dissemination of information about agriculturally based youth curriculums available to the public. By providing a location for these different state agencies to hold their trainings, the Ag in the Classroom funding made it possible for these programs to gain exposure. The participants of the training sessions have increased in their awareness of agriculturally based youth curricula, as well as in their knowledge of WVSU Extension programs. Participants received the needed training and supplies to teach youth about environmental issues.

d) **Impacts:** As a result of this interaction, teachers and volunteers have been introduced to an environmental curriculum that they may utilize in their own classrooms or volunteer efforts. The participants received the necessary resources to incorporate the various curricula into their classroom, as well as made contacts with the trainers at the different state agencies. This partnership has opened the door for further coordination of programs and projects that may result in the expansion of knowledge of agriculturally based youth curricula throughout the service areas.

e) **Funding Source:** Federal and State allocations
Scope of Impact: State and County specific

Goal 2: ***To provide a safe and secure food and fiber system***

Executive Summary:

Good nutrition is important throughout the year, yet children receiving free and reduced cost lunches during the school year may experience food insecurity during long summer breaks away from school. In some school districts in Kanawha County, West Virginia, more than 90% of elementary-aged children receive free or reduced cost lunches. These children often reside in low income housing areas where every child meets the eligibility requirements for free school lunch. Children living in poverty, while not necessarily underweight, are more likely to consume diets of poor nutritional value and more likely to be overweight and, at the same time, malnourished. In August 2004, the Dietary Guidelines Scientific Advisory Committee reported that more than half of all U.S. children, regardless of household income, fail to consume enough calcium, vitamin E, fiber, magnesium, and potassium. Lunches that meet the United States Department of Agriculture (USDA) guidelines provide most, if not all, of these nutrients.

Total Invested -	Total Funds:	$ 95,839
	Formula Funds:	$ 80,000
	FTE:	2.0

Extension Program 2.1: "*Food Safety"*

a) Description: The Summer Food Service Program (SFSP) is administered by the WV Department of Education, Office of Child Nutrition. The WVSU Office of Nutrition and Health Education (ONHE) developed the menus used for the program and then contracted with the WVSU food service department for the preparation and packaging of the meals. ONHE hired part-time summer staff for monitoring of the program and delivery of the meals. The SFSP was also monitored by the county health department, the Office of Child Nutrition and the WV Department of Agriculture. These agencies uphold federal and state food safety and nutrition standards.

b) Outputs: The Summer Food Service Program provided lunches to twelve sites and one 4-H camp in the summer of 2005. A total of 14,129 meals were provided to eligible children.

c) Outcomes: 100% of the children participating in the program received a well-balanced, nutritious lunch each day during the 10-week program.

d) Impact: Children participating in the program received at least one-third of the nutrients essential for growth and well-being. Good health is consistently linked with good nutrition.

e) Funding Source: Smith-Lever Section 1444
Scope of Impact: State Specific

Extension Program 2.2: *"Food Security"*

Roane County Food Security

a) Description: The United States Department of Agriculture Economic Research Service (USDA/ERS) showed that one of West Virginia's top livestock products annually is beef cattle. To address the Homeland Security issues in Roane County, various initiatives have taken place to inform the residents of bio-security issues. One of these events was a meeting that was held with the State Veterinarian for the West Virginia Department of Agriculture, who gave a presentation on the animal identification program. This program is designed to trace back to its source any animal that is found to contain any bio-hazardous disease/illness and eradicate the problem to ensure a safe and reliable food supply for the United States. The Roane County Extension Agent has been holding registration for Premise Identification numbers and taking Global Positioning System (GPS) locations to assist the West Virginia Department of Agriculture in this effort.

b) **Outputs:** The Extension Agent helped to coordinate an informative meeting, assisted with Premise Identification sign-ups, and marked GPS locations in Roane County. This local effort creates an opportunity to market cattle in foreign markets, increase traceability, and secure the food system in the United States. There were a total of 15 people in attendance for the informative meeting who learned about the importance of bio-security.

c) **Outcomes:** The agent completed 5 of 20 GPS locations in 2005.

d) **Impact:** Two hundred Roane County residents have signed up for Premises Identification numbers to ensure their cooperation with this national initiative. The Roane County Livestock Show and Sale adopted the Premise Identification number as a mandatory practice to show cattle in Roane County.

e) **Funding Source:** Federal and State
Scope of Impact: County and State-specific

Goal 3: To promote a healthy, well-nourished population through research and education

Executive Summary:

West Virginia is consistently ranked among the top three heaviest states. According to the Department of Health and Human Services' Centers for Disease Control and Prevention (DCD), 64 percent of West Virginia adults are obese or overweight; 29 percent of West Virginia high school students are overweight or at risk of becoming overweight, and 28 percent of low-income West Virginia children between the ages of two and five are overweight or at risk of becoming overweight. Obesity is one of the most serious risk factors for a variety of chronic diseases, such as heart disease, diabetes, and hypertension. Poor nutrition and lack of physical activity are risk factors for obesity. Moreover, people living in rural areas have a higher risk of heart disease, diabetes, and cancer. West Virginia is the second most rural state in the United States, with nearly 65 percent of its population living in communities with fewer than 2,500 people and 45 of its 55 counties designated as "non-metropolitan" by the Census Bureau.

West Virginia State University Extension's Office of Nutrition and Health Education offers programs that improve the quality of life for West Virginians through improved nutrition practices and health education. Office initiatives from October 2004 to September 30, 2005, were health literacy for senior citizens, diabetes education, after-school nutrition education, heart health education, and obesity awareness and prevention for both children and adults.

Total Invested -	Total Funds	$ 298,391
	Federal Formula Funds	$ 166,983
	FTE:	2.25

Extension Program 3.1: *"Nutrition and Health Education Programs"*

Description: Diet and nutrition are important factors in the promotion and maintenance of good health throughout the entire lifespan. Their role as determinants of chronic diseases, such as cardiovascular disease, diabetes, certain cancers, stroke, osteoporosis, and obesity is well established. Therefore, programs focusing on nutrition and wellness occupy a critical position in preventive measures. In West Virginia, one of the most debilitating medical conditions is obesity, which contributes to numerous other co-morbid conditions. While overweight and obesity can be a result of consuming excess calories, the quality of the diet is also very important. The most recent research on dietary behaviors in West Virginia indicates that respondents in the "obese" category ate the least servings of fruits and vegetables. Moreover, the 2003 West Virginia Youth Risk Behavior Survey (YRBS) found that nearly 80 percent of adolescents ate less than five servings of fruit and vegetables and drank less than three glasses of milk per day. Milk consumption is being displaced by the ever-increasing consumption of soft drinks.

Diabetes Education

(a) Description: Staff of the ONHE taught meal planning and food preparation skills for individuals living with diabetes. Participants were enrolled through senior citizens centers, newspaper advertisements, and churches. The program is offered in three weekly, two-hour sessions. The educational module is delivered by a registered and licensed dietitian. The cooking component is taught by a Master's level extension agent. A three-month follow up session was also provided at each site in order to reinforce the educational concepts.

(b) Outputs: One three-week class (six hours total) was administered in Roane County. A total of 44 people attended the series.

(c) Outcomes: One-hundred percent of the participants completed the educational program. All demonstrated an increase in knowledge regarding healthier dietary behaviors. Three months after the class, 15 participants returned for the follow-up session. The majority reported feeling empowerment and in better control of their diabetes.

(d) Impacts: Achieving better blood glucose control is the ultimate aim for those suffering from diabetes. The aptitude necessary to manage the disease involves understanding meal planning, food preparation, label reading, etc. Participants receive targeted nutrition counseling and education to gain the everyday skills needed to manage diabetes successfully.

(e) Funding Source: Smith-Lever Section 1444 Funds, State of West Virginia
Scope of Impact: State Specific

Healthy At Any Size Campaign

(a) Description: Through a partnership with Kanawha Coalition for Community Health Improvement, WVSU Extension staff presented a 30-minute PowerPoint presentation focusing on helping consumers improve their health through healthy eating, being active, and feeling better about themselves regardless of body weight. In other words, size and weight are not perfect indicators of health. By

concentrating on health, consumers can shift their measurement of success from the scale to how they feel.

(b) **Outputs:** The *Healthy At Any Size* presentation was delivered on March 3, 2005, at the WVSU Women's Health Conference. A total of 13 women participated in the class.

(c) **Outcomes:** Thirteen women took the pre-test, but only 12 participants handed in the post-test. The pre-test was composed of four questions as opposed to three questions for the post-test. Seventy-seven percent of the respondents agreed that a person can become healthier at any size (weight) prior to the PowerPoint presentation. One hundred percent of the respondents answered the question affirmatively in the post-test. In the pre-test, there was a tie between *healthy weight* and *psychological/mental well-being* as being the most important aspect of good health. In the post-test, the majority of respondents believed *psychological/mental well-being* is most important to good health. During the time of this presentation, 69.2 percent of participants were currently attempting to lose 15 or more pounds. All those who answered '*no*' to trying to lose weight believed they should have been and/or were still not happy with their body image.

(d) **Impacts:** This presentation conveys to participants that being thin does not always equate with good health. Health and well-being are multi-dimensional and emphasis should be placed on accepting and respecting the diversity of body shapes and sizes.

(e) **Funding Source:** Smith-Lever Section 1444 Funds, State of West Virginia
Scope of Impact: State Specific

Health Literacy Project

(a) **Description:** In 2003 the Office of Nutrition and Health Education, in collaboration with a number of other entities, developed a health literacy program which was first targeted to the senior population. In 2004 a teaching curriculum and personal health history journal were designed to educate and empower program participants to be more involved in their health care decisions. The journal provides a tool for individuals to record relevant health history, insurance information, medication usage, medical test results and other pertinent information. Taking the journal to medical appointments helps to promote the patient's ability to provide more accurate information to health care providers.

(b) **Outputs:** This program was presented to 1,500 participants at 50 Senior Citizen Centers in 11 counties for the Metro Area Agency on Aging. Metro AAA is one of four geographical areas under the umbrella of the WV Bureau of Senior Service. It was also presented to an additional 13 groups with a total of 153 participants.

(c) **Outcomes:** 100% of the participants reported an intention to use their Personal Health Journal at their next doctor's appointment. 100% indicated that the communication methods taught would improve their next doctor's appointment. 99.5% of the participants gave the program the highest rating for effectiveness.

(b) **Impacts:** The health literacy project empowers participants to take a more active role in the management of their overall well being as well as management of any

physical challenge they may be experiencing by asking questions, considering alternative treatments, and improving self-efficacy.

(e) Funding Source: Smith-Lever Section 1444 Funds, State of West Virginia
West Virginia Bureau of Senior Services

Scope of Impact: State Specific

Junior Chef School Project

(a) Description: In 2005 the Office of Nutrition and Health Education, in collaboration with a number of other entities, developed a Junior Chef School program that targeted middle school-age students. The teaching curriculum was developed to be used during the pilot program in June 2005. The objectives of the WVSU Junior Chef School program were to increase the number of participants who eat breakfast each day, increase the number of fruits and vegetables consumed each day to five servings, increase the number of participants who consume the recommended amount of calcium each day and to improve label reading skills.

(b) Outputs: This program was presented to 43 participants at two Kanawha County High Schools.

(c) Outcomes: 76% of participants increased their intake of fruits and vegetables, and 62% increased their consumption of dairy foods.

(d) Impacts: The Junior Chef School program empowered participants to begin making healthier food choices. The students were able to select foods, as well as learn basic food preparation skills to prepare foods for themselves.

(e) Funding Source: Smith-Lever Section 1444 Funds, State of West Virginia
Community Based Initiatives (CBI) Grant - $17,375.
CBI Osteoporosis Grant - $8,000.

Scope of Impact: State Specific
Kanawha County Middle Schools

After-School Nutrition Education Project

(a) Description: In 2005 the Office of Nutrition and Health Education presented a nutrition education program to be presented to the WVSU After-School sites in Kanawha County. The program goals were to introduce the participants to eating fruits and vegetables and eating all the right amount of foods from the food guide pyramid. The Office of Nutrition and Health Education extension agent used story books and gaming materials to accomplish both objectives. A book entitled *I Will Never, No Never Eat a Tomato* was used to encourage the students to eat tomatoes and other vegetables. The game *"Make a Big Deal about Nutrition"* was the resource used to teach the recommendation of the food guide pyramid.

(b) Outputs: The program was presented at 4 program sites, 12 times with a total of 37 participants.

(c) Outcomes: 100% of the program participants consumed and indicated enjoyment of the miniature tomato sandwich. This was an amazing result given

that at least 20% of each class indicated that they did not like and would not eat a tomato.

(d) **Impacts:** The Nutrition Education program encouraged the participants to begin consuming more vegetables and would also begin trying new ones.

(e) **Funding Source:** Smith-Lever Section 1444 Funds, State of West Virginia

Scope of Impact: State Specific

Goal 4: To achieve greater harmony between agriculture and the environment.

Total Invested -	Total Funds	$ 17,000
	Formula Funds	$ 15,000
	FTE:	0.25

Extension Program 4.1: "Environmental Conservation"

Japanese Knotweed Research

a) **Description:** Non-native invasive weeds continue to be a program for homeowners and farmers. Many times as an invasive weed encroaches upon land, native species are destroyed and their value is lost. One high-profile invasive weed gathering much attention in West Virginia currently is Japanese Knotweed. It is invading pasture after pasture, replacing native grasses, and has little to no nutritional value to livestock.

b) **Outputs:** The Extension Agent has collaborated with West Virginia University (WVU) on a Japanese Knotweed control project. The Extension Agent will be responsible for monitoring and analyzing the project test plots. Eleven different mixtures of herbicides were applied to determine the optimal control of Japanese Knotweed. The Extension Agent has successfully completed all the evaluations.

c) **Outcomes:** An effective control for Japanese Knotweed as a noxious plant will be determined and a safe/effective plan for the eradication of Japanese Knotweed can be implemented by land-owners state-wide.

d) **Impacts:** West Virginia State University has completed the project. There were three plots that showed a 99% control rate and one other plot that had an 85% control rate, the other plots control rates were too low to view as a significant control recommendation.

e) **Funding Source:** Federal and State allocations

Scope of Impact: State and county specific

Goal 5: To enhance the economic opportunities and quality of life among families and individuals.

Executive Summary:

With almost 18% of its population living below the poverty line, West Virginia ranks as the second poorest state in the nation, with a poverty rate almost 150% of the national average. This extreme poverty results from a significant downshift in coal mining, manufacturing and non-durable goods production. The economic characteristics of much of the state, according to the Appalachian Regional Commission (a federal-state partnership for the development of the Appalachian region), reflects this downshift. In their 2004 report, 19 of the state's 55 counties were ranked as being distressed, the lowest economic category, and none were ranked at their highest level. Additionally, of the counties being served by the Extension Service, several fall within two other federal categorizations for extreme plight: Enterprise Communities and Champion Communities. Typically, Enterprise Communities by their nature are the poorest, most economically blighted in the country. McDowell County has been designated as an Enterprise Community, while Fayette and Nicholas counties are part of the five-county Central Appalachia Enterprise Community. Summers, Greenbrier, and Monroe are part of the Tri-county Champion Community and Wyoming County received the designation independently. The region received these federal blight designations because many of the communities within these counties lack capital and declining tax base, have aging populations with high disability levels, as well as suffer from high unemployment and low availability of new jobs. These economic conditions have affected the fiber of the whole community, where many communities have largely abandoned down-towns, housing stock that is old and in need or rehabilitation, and a workforce that is in need of redevelopment and new opportunities for employment. These challenges present an opportunity for the delivery of educational programs and services that assist individuals, families and entire communities with development and redevelopment assistance.

Resource Allocation:

Total Invested -	Total Funds:	$1,010,753
	Formula Funds	$ 664,609
	FTE:	17.25

Extension Program 5.1: "4-H Youth Development"

After School Program

(a) Description: West Virginia State University Extension administers four after school programs for youth in Kindergarten through sixth grades. The after school programs are located in three low-income Charleston Housing family developments, and one privately-owned subsidized apartment complex. The main purpose of the after school program is to provide a safe place where children can spend their out-of-school hours. During the hours of operation (weekdays from 2:00-6:30 p.m.), the after school programs provide homework

help, opportunities to interact with literature, behavioral and social development strategies, recreational activities, and educational and cultural enrichment in a safe and nurturing environment. In addition, children are provided with a nutritious snack every day.

(b) **Outputs:** The program serves approximately 100 students per year. In addition, approximately 7 youth in 7^{th}-9^{th} grades and 10 adults volunteer at the sites on a regular basis.

(c) **Outcomes:** 51% of students in the After School program increased one letter grade in at least one core academic class during the year. In addition, students in the program experienced 22% fewer discipline referrals at school.

(d) **Impacts:** The After School program provides access to the Internet, educational software packages, and computer tutoring to any child who lives in one of the surrounding housing communities and wants to attend. West Virginia State University Extension is the only provider of this service to the area and its subsidized housing communities.

(e) **Funding Source:** Smith-Lever Section 1444; The Mayor's Office of Economic and Community Development Community Development Block Grant; Verizon Foundation; Verizon SuperPages; Neighborhood Networks Grant

Scope of Impact – County specific

Health Sciences and Technology Academy Forensics Summer Institute

a) **Description:** The Health Sciences and Technology Academy Program provides academic enrichment focused on science and math for each grade from 9^{th} through 12^{th} as well as laboratory experiences where students work with scientists and/or clinical practitioners. The students work on projects emphasizing science in ways to develop their knowledge and skills in collecting, analyzing and interpreting crime data. The students are shown a number of ways to collect crime data, from crime scene observation to suspect and witness interviews, to actual evidence processing. The tenth-grade students who attend the Forensics Summer Institute at WVSU are greeted on Sunday Night with a crime scene from which they are expected to collect data and observe the visual aspects of the scene. Throughout the week, the students interview potential suspects and witnesses in order to gather evidence to utilize with other evidence to solve the crime; learn how to process evidence at a crime scene through a myriad of forensic science methods – DNA processing, fingerprint collection and identification, and thin layer chromatography, just to name a few; and meet in groups with their teacher/advisor to determine who committed the crime. On the final day of the institute, the student groups present their findings to science faculty, teachers, Land Grant personnel, and fellow students.

b) **Outputs:** The 2005 Forensics Summer Institute served 54 youth from throughout West Virginia. Seventeen West Virginia counties were represented. In addition, seven West Virginia teachers learned about techniques for teaching Forensic Science.

c) **Outcomes:** 100% of teachers indicated that the information learned would benefit them to some degree in the classroom. 75% of teachers perceived that the

Summer Institute had an impact on whether or not students would select science or health-related careers. Approximately 93% of students indicated that the Summer Institute would have an impact on whether or not they would select a science or health-related career, with 35% indicating that the summer institute had a "high" or "very high" impact on that decision. Nearly 70% of students indicated that they had learned either "a lot" or "quite a bit" about the seven Forensic areas of focus (DNA, Blood Spatter, Handwriting Analysis, Chromatography, Fingerprint Analysis, Drug Identification, and Evidence Processing).

d) **Impacts*:*** The majority of 714 HSTA students from the first four cohort groups are still in college. 23% of the 714 students have gone on to graduate or professional school. 49% of those in graduate or professional programs are enrolled in health science areas. Ten of the HSTA scholars are currently in medical school.

"Many of the students that I had in class were thinking of a forensics career. Now they know what their level of education will be. It also gave them a better knowledge of what would be expected of them as a scientist." (Teacher, Forensics Summer Institute, 2005)

"After trying to solve the investigation on the murder case, I thought about going into a forensics career." (Student, Forensics Summer Institute, 2005)

"This summer institute showed me how many science and medical aspects were involved in solving a crime. I have always been interested in forensics but this camp showed me even more about it." (Student, Forensics Summer Institute, 2005)

e) **Funding Source:** Smith-Lever Section 1444; Howard Hughes Medical Institute; Stanley & Virginia Hostler; National Institutes of Health Science Education Partnership Award; Benedum Foundation; Centers for Disease Control; Robert Wood Johnson Foundation; State of West Virginia; and West Virginia University Health Sciences Center

Scope of Impact – State specific

Hip-Hop Boot Camp

Description: The Hip-Hop Boot Camp is a non-traditional 4-H summer camp that attracts youth interested in the music industry. During the one-week, residential camp, the teens participated in track sessions that teach production, song and rap writing, turntables, dance, photography, filmmaking, graffiti art, and jewelry design. The track sessions provided every participant with a minimum of 12 hours of instruction in the Arts and additional activities provided six hours of physical activity, eight hours of small group mentoring, and three hours of entrepreneurial instruction and activities.

a) **Outputs:** During the summer of 2005, the Hip-Hop Boot Camp served 90 youth in grades 7-12. The camp also employed the talents of 18 adult counselors.

b) **Outcomes**: The camp had incredible growth in interest with a 35% increase in participants. The camp also attracted youth from four counties and added high school-age participants. The track sessions, which are the classroom times, were the most popular part of the camp. In the final evaluation, the most requested change for 2006 was an increase in classroom time and every camper reported learning during their track time, with 67% reporting that they learned a lot. Also,

69% of the teens reported that the majority of the skills they learned will assist them in the future. In addition to the instruction in the Arts, each camper also received six hours of business skills and exercise and nutrition instruction, which resulted in 71.4% of the teens reporting that they learned more about business skills and 52.4% reporting that they learned more about exercise and nutrition.

c) **Impact:** The camp continues to show incredible growth potential. On the final camp survey, 97% of the participants reported a desire to attend the 2006 camp. Additionally, 100% of the campers would recommend the camp to their friends.

d) **Funding Source -** Smith-Lever Section 1444; The Greater Kanawha Valley Foundation; 304Live.com; West Virginia Human Rights Commission
Scope of Impact – Multi County - Participants and staff came from Kanawha, Raleigh, Fayette, Cabell, Monongalia, Tyler, and Wood Counties.

Extension Program 5.2: *"Community and Economic Development"*

Economic Development Authority Partnerships

a) **Description**: The economy of many regions of West Virginia is being forced to re-align from a reliance on coal, timber and rail into new economies that center around tourism and technology ventures. This necessity for new industrial development has created an important need for localized community and economic development assistance for many regions of our state.

b) **Output**: Assess community and economic development needs within the service region to assist in providing communities with access to needed community and economic development program efforts that have a measurable impact on development needs of the service region.

c) **Outcome:** WVSU has begun the placement of community and economic development agents in service counties. An agent is now housed in Fayette County, Wyoming / McDowell County and Kanawha County, each focused on CED issues.

d) **Impact:** The agents are delivering numerous programs, working with partners on strategic initiatives such as the development of a 1000 acre mixed–use community, provision of a county-wide youth leadership program and entrepreneurial assistance to small business owners receiving county economic development loan funds.

e) **Funding Source:** 4-C Economic Development Authority, Wyoming county Economic Development Authority, Fayette County Commission, Federal and State Allocations
Scope of Impact: County Specific

Workforce Education and Career Awareness Website www.WECAN4U.net

a) **Description:** In September 2000, a collaborative multi-state agreement was effected with the Alabama Cooperative Extension System – Alabama A&M University, in order to establish a national website promoting workforce development, financial literacy, employment, and training opportunities. The site was developed and posted on the World Wide Web in July 2001, in order to bridge

the digital divide via the utilization of information technology. In addition, the website received national recognition from the 1890 Association of Extension Administrators when it received the 2003 Innovative Program in Technology Award. Furthermore, the USDA awarded a $10,000.00 grant to the program in November 2003. The monies are intended to provide further support for site development, search engine registration, promotion, and inclusion of other states within the website schema.

b) **Outputs:** The website generated over 2000 hits in the annum.

c) **Outcomes:** Site feedback included participant increases in knowledge of Internet sites regarding training and educational opportunities, Workforce Investment Act information, and employment prospects.

d) **Impact:** Established in 2001, wecan4u.net continues to serve as a gateway for workforce development information for utilization from individuals throughout the world. As site maintenance costs less than $20.00 per month, the site serves as a cost efficient illustration of how a multi-state initiative can serve thousands of individuals for less than one dollar per person.

e) **Funding Source** – Smith-Lever (Section 1444)
Scope of Impact – Multi-state, national, and international

Extension Program 5.3: "Minority Business Affairs"

a) **Description:** Over the past 10 years, minority-owned businesses have grown at double the rate of all other firms nationwide, making up 12% of the nation's businesses, and now have a purchasing power equal to 20% of the US disposable income. While this national trend has been very positive, West Virginia has unfortunately not mirrored the rest of the nation in minority business development or purchasing power. Even in Kanawha County, which has the largest number of minority residents in the state, minority-owned businesses comprise only 1% of the total businesses and this percentage is even less in the other counties.

b) **Output:** With support form a HUD grant awarded in the amount of $550,000, WVSU has purchased a facility to house an economic development center. This Center has the mission of providing education and training for low income residents of Kanawha County as well as providing an entrepreneurial development/ business incubator that specifically targets low-income minority business development.

c) **Outcome:** A center has been established and partnerships developed such that the programmatic efforts can now begin.

d) **Impact:** The Center is now fully established, over 90 community members have sought assistance through the Center, and programs are beginning that will provide a variety of workforce development training, homeownership/credit restoration, small business development assistance and business incubation.

e) **Funding Source***:* Housing and Urban Development Grant, Federal and State Allocations
Scope of Impact: County Specific

***Extension Program 5.4**: "Technology and Literacy Education"*

a) **Description**: Several programs and initiatives are underway that provide educational training that helps address the skills necessary to achieve individual economic self-sufficiency. These skills include general educational development such as literacy training and GED preparation, goal setting and leadership development, entrepreneurial training, employment skills including job training, job search, and placement assistance, labor retention skills, financial literacy, and computer utilization. The first of the initiatives is the Community Learning Centers / Neighborhood Networks Program in which Extension presently oversees or provides support for fourteen sites within Charleston that offer an array of technology literacy and life skills development programs. Four of the sites are located in community or faith-based sites, where WVSU Extension continues to provide Internet access and limited training support. Ten of the sites are located in Charleston Housing, the local public housing authority which provides family and senior living to approximately 2000 low-income residents. These sites include South Park Village, Carroll Terrace, Lippert Terrace, Lee Terrace, Jarrett Terrace, Littlepage Terrace, Oakhurst Village, Hillcrest Village, Washington Manor and Orchard Manor. The Neighborhood Networks grant program of HUD funded these sites programmatically. Through Charleston Housing, WVSU Extension manages the $200,000 program.

b) **Output:** Thirteen individual literacy and technology program topics were delivered to more than 200 residents covering every housing community and community center with at least one program. These include topics such as: Computer Basics, Talking to your Doctor; Workforce Development, Literacy, Life Management Skills, E-Mail, Site Seer's Club, Business Card Development, Basket Weaving and Technology. One full-time grant funded staff member works with the WVSU Extension Agent to provide regular weekly hours at each site, resulting in 450 hours of open access to the computer labs for the residents of these limited resource areas.

c) **Outcome:** Fourteen community centers with computer labs were fully operational and making technology accessible to more than 2000 low-income residents.

d) **Impact**: Learning Centers were fully established in fourteen limited resource communities that provided low-income residents with important access to technology formerly not available to them. Low-income students used this access for homework, computer literacy, and e-mailing. Adult residents used the site for online banking (particularly among the elderly), resume writing and job searches. This access to technology permitted these participants to have the educational resources not within their means otherwise, and allows them to remain competitive with individuals already with access and familiarity with technology.

e) **Funding Source:** Housing and Urban Development Grant, Higher Education Policy Commission Grant, Federal and State Allocations
Scope of Impact: State Specific

***Extension Program 5.5**: "Rural Business Services"*

(a) Description: This program was initially developed in November 2003 with a $136,000 grant from the USDA and operates under the mission of the Rural Business Cooperative Service. Notification was received that the USDA awarded an additional $100,000 for the continued support of this program. The program strives to provide outreach to small rural communities through the delivery of programs that will develop future entrepreneurs and businesses in economically distressed areas. The program specifically targets eleven counties in southern West Virginia (Fayette, Greenbrier, Mercer, McDowell, Monroe, Nicholas, Pocahontas, Raleigh, Summers, Webster and Wyoming). An additional focus on the counties of McDowell, Summers, Webster and Wyoming was provided because of their designation as "distressed" based upon their poverty statistics, loss of population, average income and average unemployment.

(b) Output: Working in partnership with the USDA's state program for Rural Business Services, and a host of other state and private partners such as the Small Business Development Center of the Workforce Investment Board, region 1, several key directions for this program were identified. These include:

1) low-cost training, which is being co-sponsored frequently with the state and local SBDC;
2) regional collaboration / facilitation;
3) community fair and festival development;
4) specialty foods development and tourism related small business development.

c) Outcome: Notable accomplishments for this program include the sponsorship of a regional Women's Conference attended by over 60 prospective or existing businesswomen from southern West Virginia. The second annual sponsorship of a state-wide conference for the Specialty Foods cooperative that provided individualized business development assistance for approximately 40 small businesses; and a county assessment that provided important analysis of possible business development opportunities for this rural, blighted county.

d) Impact: The program resulted in the delivery of several training and development opportunities that served to strengthen the capacity for growth among local businesses with limited resources. Through the partnerships formed during the first year of the WVSU RBS program, the entire region of 11 counties has formed a partnership to create a region-wide economic development plan for southern West Virginia. This partnership consists of representatives from the Economic Development Authorities, non-profits, technology providers, and higher education. This partnership provides the opportunity for focused business development and growth, which is critically needed to address the declining economy in this region.

e) Funding Source: USDA Rural Business Services Grant, Federal and State Allocations

Scope of Impact: 11 counties in Southern West Virginia

Extension Program 5.6: "Adult and Family Education"

Pregnancy Prevention

a) Description: The program area of Adult and Family Education addresses adolescent pregnancy using the "Baby Think It Over®" program. With this program, computerized infant simulators are utilized to demonstrate the responsibilities associated with parenting. Teen participants are assigned a simulator that cries and needs life-like care (e.g. bottle feeding, diaper changing, burping, rocking, etc.) The goal of this program is to increase awareness among teens of the time, effort, responsibility, and skills required to raise an infant. It also encourages teens to wait to become parents until they are older and able to adequately provide financial and emotional care for children.

b) Outputs: Approximately 237 youth and adults have participated in Baby Think It Over®, which addresses parenting topics and pregnancy prevention. Approximately 2,756 hours have been spent addressing the various topics and activities that are encompassed in the program.

c) Outcomes: Pre-and post-test data indicate that 100% of the Baby Think It Over participants demonstrated an increased knowledge of the responsibilities of parenting. Comments of participating students indicate the successful impact this simulation had on their views of teenage parenthood.

d) Impact: As the goal of this program was to offset adolescent pregnancies in the area, many of the participants indicated that they did not want the responsibilities at such an early age, thereby decreasing their initial tendencies to participate in behaviors that could lead to unwanted pregnancies.

e) Funding Source: Smith-Lever Section 1444 Funds
Scope of Impact: State Specific

Transitional Living Program

a) Description: WVSU built two facilities on campus to provide in-residence assistance to two growing populations that are often neglected academically and unprepared for any higher education curriculum. HOUSE (Helping Our Undergraduates Succeed in Education) assists at-risk youth with attending college for the first time, as well as preparing them for the transition into dormitory or independent living. The respective facility can house six students and two resident assistants. A Program Agent also serves as the staff, providing needed intensive case management services. The second initiative and respective facility (Phase II) consists of three apartments (two 1-bedroom units and one 2-bedroom unit) where formerly homeless or battered women may reside while completing their college education. The Program Agent also assists these residents. The Program Agent teaches participants in both programs needed independent life skills.

b) Outputs: Twelve residents participated in 49 independent life skills lessons addressing assessed deficiencies in the areas of independent living. A total of 4941.5 contact hours have been spent with these residents that include case management services, volunteer activities, meetings, crisis management, and 24-hour support from resident assistants. On average, program participants received 12 hours of one-on-one time with the Case Manager per month.

c) **Outcomes:** 100% of both HOUSE and Phase II students who completed at least one successful semester in the program continue to take classes on the campus, work towards their degree and consider themselves forever connected to HOUSE. At least three students have been dean's list participants. Students who are often marginalized have been empowered to make positive, sustainable changes in their lives directly due to the support of this program.

d) **Impact:** The HOUSE and Phase II programs provide both group and individually tailored case management services to clients in a residential setting. These services result in the at-risk population having an opportunity to obtain a higher education, a residence of their own, and greater potential for future long-term employment as a result of the skills they learn while in the transitional living program. Referral agencies, residents, social service providers, and youth in foster care continue to actively support this program and its ongoing development.

e) **Funding Source**: Smith-Lever Section 1444 Funds, State Funds, Self-Generated Program Funds
Scope of Impact: National

CONTACT INFORMATION

Correspondence in regard to this report of accomplishments should be directed to:

Dr. Orlando F. McMeans
Dean and Director,
1890 Cooperative Research and Extension

West Virginia State University
Gus R. Douglass Land-Grant Institute
for Agricultural, Consumer, Environmental, and Outreach Programs
201 ACEOP Administration Building
P.O. Box 1000
Institute, WV 25112

mcmeanso@wvstateu.edu
(304) 766-4291 (Office)
(304) 766-4292 (Fax)