



West Virginia State University

# **Annual Report of Accomplishments and Results**

*(FY 2004)*

For Plan of Work FY 2000-2004

1890 Cooperative Research & Cooperative Extension

A handwritten signature in black ink, appearing to read "O. F. McMeans", is written over a horizontal line.

Orlando F. McMeans, Ph.D.

**DEAN AND DIRECTOR**

**Division of Agricultural, Consumer, Environmental, and Outreach Programs**

# Annual Report of Accomplishments and Results - FY 2004 -

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## **SECTION I. INTRODUCTION**

### **Report Summary & Structure**

This report provides an update of the annual accomplishments for research and extension activities conducted by the Agricultural and Environmental Research Station (AERS) and the West Virginia State University Extension (WVSUE) Departments at West Virginia State University (WVSU) for fiscal year 2004. More specifically, it describes each of the 1890 research and extension programs and their impacts. As required by the USDA-CSREES, the report has been structured so it addresses the five national initiatives and provides key themes for each of the program components (areas). A section of summary of resources, including personnel and financial allocations invested for each of these five national mandated goals and key themes, is available. The report presented in to sections: Section II describes the accomplishments and results for the institution's 1890 Research Programs; whereas section III provides information on the Extension Programs.

### **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 development and implementation phases of its research and extension programs in FY 2000 and 2001. The Department of Land-Grant Programs (now Division of Agricultural, Consumer, Environmental, and Outreach Programs or ACEOP) was established on March 17, 2000 to serve as the land-grant administrative and operational entity of the University. Its primary function is to deliver the institution's land-grant mission related to the dissemination of research, teaching, and extension services to the state's citizens. The Division of ACEOP is now fully operational and possesses reputable research, extension, and outreach programs within the State.

The Federal fiscal support for FY 2004 was maintained at nearly \$1 M for extension and \$ 1 M for research. Although the University received, for the first time in its history, state appropriated dollars to match 70% of its formula funding for FY 2003, in 2004 the State Legislature did not appropriated state matching dollars for the University, during the regular 2004 legislative session. However, the State Legislature has acknowledged the need for the University's state match and is presently exploring ways to appropriate funds so the institution meets its required mandate for both 2004 and 2005 fiscal years. As state appropriations and other federal and non-federal funding are secured, the University gradually has extended its research and extension services to more than 15 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 steps: (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 Division of Land-Grant Programs (ACEOP) and Academic Affairs Unit have developed an appointment system that allows research faculty to participate in land-grant funded activities. This appointment system further allows land-grant staff members to participate in the University's teaching activities, when 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's Division of ACEOP 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 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 such as the Partnership of African American Churches (PAAC) 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.

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 (WVU) 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 will help the citizens of West Virginia improve their lives and communities. In January 2003, WVSU placed its first county-based extension educator in Clay County (one of our most needy counties), co-locating with a WVU agent in a shared office in the Courthouse. Collaborative projects between WVSU and West Virginia University are underway. Both institutions work diligently and coordinate collaborative efforts to avoid program duplication.

## SECTION II. 1890 RESEARCH PROGRAMS (AERS)

**Table 1** AERS Programs: Summary of Resource Allocation by Goal and Program

### 1890 RESEARCH PROGRAMS (AERS)

<b>ANNUAL ALLOCATION OF RESOURCES (FY 2004)</b>						
<b>NATIONAL GOAL / INSTITUTIONAL PROGRAM</b>		<b>FUNDING SOURCE</b>				
<i>Goal</i>	<i>Program Area</i>	<i>Federal Formula</i>	<i>Federal Other</i>	<i>State Match *</i>	<i>TOTAL</i>	<i>SY's</i>
<b>GOAL I</b>						
Program 1.1	Agricultural Biotechnology	196,685	25,500	98,343	320,528	1.0
Program 1.2	Alternative Agriculture	105,685	13,766	47,231	166,682	0.75
	<b>Total</b>	<b>302,370</b>	<b>39,266</b>	<b>145,573</b>	<b>487,210</b>	<b>1.75</b>
<b>GOAL II</b>						
Program 2.1	Food Quality and Safety	35,685	7,731	14,274	57,690	0.25
	<b>Total</b>	<b>35,685</b>	<b>7,731</b>	<b>14,274</b>	<b>57,690</b>	<b>0.25</b>
<b>GOAL III</b>						
Program 3.1	Human Health and Nutrition	30,685	10,000	15,343	56,028	0.25
	<b>Total</b>	<b>30,685</b>	<b>10,000</b>	<b>15,343</b>	<b>56,028</b>	<b>0.25</b>
<b>GOAL IV</b>						
Program 4.1	Environmental Conservation and Remediation	226,202	144,130	113,101	483,433	1.00
Program 4.2	Microbiology	395,000	244,130	197,500	836,630	7.00
	<b>Total</b>	<b>621,202</b>	<b>388,260</b>	<b>310,601</b>	<b>1,320,063</b>	<b>8.00</b>
<b>GOAL V</b>						
Program 5.1	Regional Economic Forecasting	31,000	10,000	12,400	53,400	0.25
	<b>Total</b>	<b>31,000</b>	<b>10,000</b>	<b>12,400</b>	<b>53,400</b>	<b>0.25</b>
<b>GRAND TOTAL</b>		<b>\$ 1,020,942</b>	<b>\$ 455,258</b>	<b>\$ 498,191</b>	<b>\$ 1,974,391</b>	<b>10.50</b>

\* State match appropriations spent between October 1, 2003 thru June 30, 2004

### **WVSU AERS (1890 Research) Overview**

West Virginia State University has worked diligently in the last five years to establish land-grant related research programs that are responsive to the critical needs prevailing in the state. In only 4 years, the University has implemented and advanced 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 2004 was devoted to advancing the institution's 1890 research programs and to build research capacity. Faculty and qualified scientists (June 2003 & October 2004) have been gradually 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 5-year plan of work for fiscal year 2004.

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. West Virginia farmers and landowners are in need of high value cash crops, which require minimal space. Of the 20,500 farms in the state, 67% are less than 180 acres, mostly in woodland, and 80% sell less than \$10,000 of products per year. Crops such as culinary herbs and ginseng could gross as much as \$10,000 per acre. Research and extension will focus on production and marketing strategies of alternative crops, such as ornamentals, herbs and organic produce, as well as economic analysis of different herb production systems.
- (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: \$487,210**  
**SY: 1.75**

### **Program 1.1: Agricultural 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:** The project is progressing and will be continued.
- e) **Source of Expenditures & Impact Scope:**  
Funding Source- Evans-Allen (Section 1445); State Match  
Scope of Impact- State-specific, 1890 Research

## **Project 2:** *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:**

1. In the spring of 2004, twenty two greenhouse beefsteak tomato varieties were evaluated along with nine other tomato varieties for days to first fruit, weight,

- size, soluble solids and taste. Three of the greenhouse varieties produced the heaviest and largest marketable tomatoes: Cabernet, Caruso, and Lynx. However one of these varieties in an unofficial taste survey was identified as the “worst tasting tomato”. The standard variety, “Trust” ranked in the middle, suggesting the growers/farmers of greenhouse tomatoes show investigate other varieties on the market currently. Trust should not be used as the standard tomato for production or taste, but rather a couple of varieties for research comparison purposes.
2. Results from Spring 2004 experiment were presented at the 2004 WVSU Research Symposium
  3. In the fall of 2004, ten (10) greenhouse varieties including new and previously tested lines were planted along with forty heirloom varieties and twenty-one determinant lines were planted in the hydroponic system. These plants will be tested as in the spring for weight, size, soluble solids and taste. In addition, DNA was extracted from leaf material for AFLP analysis.
  4. Attended the 1<sup>st</sup> Tomato Disease Symposium in Orlando, FL
  5. Attended the Tomato Breeders Roundtable in Baltimore, MD

**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):** Greenhouse tomato varieties developed will assist West Virginia and southern greenhouse tomato producers to increase their competitive edge in greenhouse tomato production, require fewer pesticides, taste better and better adapted to North American climates.

**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 3: 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.

**Process:** Recovered protein was formulated into six diets (40% crude protein) were both isonitrogenous and isoenergetic. Different levels (0, 5, 10, 15, 20, and 25%) of recovered protein replaced with protein supplied by spray-dried egg white. The diets were fed to juvenile rainbow trout for 96 days.

- a) **Results:** Results indicate that it is not possible to substitute dietary protein in the semi-purified diets with the recovered protein from the poultry waste, without a deleterious effect. The dietary inclusion of recovered protein from the poultry wastes negatively affected weight gain, specific growth rate, and feed efficiency. Fish fed recovered protein had lower hepatosomatic and viscerosomatic indices, lower amount of whole-body fat and higher amount of body ash.
- 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):** The full impact of the usage of protein source from thermophilic anaerobic digestion of poultry is yet to be established. The results from hybrid bluegill study suggested that 20% of the protein in the diet can be replaced with protein from the poultry wastes without any deleterious effects. A similar experiment with rainbow trout shows detrimental effects. Therefore the applications of this protein substitute may be fish dependent. Thus more work is needed to determine the limits of utility.  
A partnership was established between scientists at WVSU, and the University of Exeter, United Kingdom, and Enviro Control Limited that specializes in biofermentation. Dr. David Stafford, the Director of Biotechnology South Wales Limited, Reed Hall of the University of Exeter, and the Managing Director of Enviro Control Limited, Cardiff, Wales, United Kingdom has agreed to cooperate on this project as a consultant. He is renowned environmental microbiologist who developed the thermophilic anaerobic digester, a third generation of the mesophilic technology used in the recovery of protein from poultry wastes that will be utilized in this project. Dr. Stafford is a visiting professor in the WVSU Department of Biology and has been involved with the West Virginia Department of Agriculture Biological Waste Energy Recovery (BIOPLEX) project, as a consultant for the optimal utilization of our pilot plant digester.
- 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

**Program 1.2: Alternative Agriculture**

**Project 1:** *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:** Experiments evaluating feeding practices showed that the use of restricted feeding, 0.5% dietary phosphorus level and 34:30 protein/fat content did not significantly impact growth but will significantly reduce feed cost and phosphorus output rainbow trout culture systems since dietary fat is cheaper than dietary protein. Experiments evaluating zeolite use showed that bentonite and clinoptilolite appeared to be good candidates for inclusion in the diets of rainbow trout since there were linear increases in weight gain and feed conversion among the various treatment means. Their inclusion levels used might not have been enough to produce significant effects. Inclusion of phillipsite in the diets impairs growth and feed conversion.
- b) **Successes Resulting in Change (Outcomes):**  
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 of the papers have been accepted to be presented at Aquaculture America 2005, New Orleans, Louisiana. January 2005.
- c) **Stakeholder Benefits (Impacts):** 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.

- 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

## **Project 2:** *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:**
  - 1. Two referred articles published
    - i. Liedl, BE, M. Cummins, A. Young, M. L. Williams, J. M. Chatfield. (2004). Liquid Effluent from Poultry Waste Bioremediation as a Potential Nutrient Source for Hydroponic Tomato Production. *Acta Hort.* 659:647-652.
    - ii. Liedl, BE, M. Cummins, A. Young, M. L. Williams, J. M. Chatfield. (2004). Hydroponic Lettuce Production Using Liquid Effluent from Poultry Waste Bioremediation as a Nutrient Source. *Acta Hort.* 659:721-728.

2. An oral paper and poster were delivered at the Protected Culture in Mild Winter Climates ISHS symposium in Orlando, FL
  3. An oral presentation was given at the 2004 annual meetings of the American Society of Horticultural Science in Austin, TX
  4. A poster was displayed at the 2004 Anaerobic Digestion meetings in Montreal, Canada
  5. Abstract accepted for oral presentation at the 4th International Symposium on Anaerobic Digestion of Solid Waste in Copenhagen, Denmark
  6. Abstract submitted for presentation at the 2005 annual meetings of American Society of Horticultural Science in Las Vegas, NV
  7. Subcontract from a USDA-OREI project entitled "The Organic Seed Partnership" with Cornell will fund organic variety trials with WV farmers for the next three years.
- b. **Successes Resulting in Change** (Outcomes): This work is not sufficiently mature to show extension or outreach outcomes. However, public presentation of the research and establishment of collaborations with WV farmers/growers and other researchers has made institutional endeavors better known to WV farmers/growers and the scientific community.
- c. **Stakeholder Benefits** (Impacts):
1. Tested new production systems (i.e. vertigro system)
  2. Investigated new crops for farmer/growers in WV (i.e. out of season strawberry production; organic crop production)
  3. Starting in the summer of 2005 3-5 WV farmers will be involved with organic variety trials as part of the "Organic Seed Partnership"
- d. **Assessment of Accomplishments:** The projects are progressing and should be continued.
- e. **Source of Expenditures & Impact Scope:**
- Funding Source-
1. Evans-Allen (section 1445) 2003-2005
  2. Bioplex Phases 3 & 4 2003-2005
  3. USDA OREI-OSP subcontract from Cornell 2004-2007
- Scope of Impact- State, Regional, National, International

<b>Goal 2:</b> To provide a safe and secure food and fiber system ...
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### Executive Summary:

- (A) A multi-state integrated 1890/1862 extension and research project has continued between WVSU and Virginia Tech staff. The goals of this work are to identify production practices on dairy operations and develop alternatives that improve food safety. The research activities in this project have been completed.

- (B) This project's research findings are in the process of being published and distributed through Virginia Tech.
- (C) Distribution to clientele and documentation of the benefits is in progress.
- (D) This research activity was successfully completed and the research program ended in September, 2004.
- (E) Resource Allocation: **Total Invested** - \$57,690  
**SY** - 0.25

## Program 2.1: Food Quality and Safety

### **Project 1:** *Safe Quality Food Practices: Farm to Consumer.*

**Description:** The project goals are to identify production practices on West Virginia and Virginia dairy operations and develop alternatives that improve food safety. Scientists will establish a base of operations and associated rationales, then suggest improvements to increase dairy product safety, reduce costs and reduce use of antibiotics. This is a two-state effort with responsibilities shared by staff at West Virginia State University and Virginia Tech. A WVSU scientist is responsible for designing, conducting and analyzing the survey instrument. Information generated in the survey phase will be utilized by Virginia Tech food scientists to develop improved dairy practices.

- a) **Research Results:** The WVSU scientist is primarily responsible for providing auxiliary services to food scientists at Virginia Tech. The survey instrument has been distributed and the data was compiled into a final report.
- b) **Successes Resulting in Change (Outcomes):** This work resulted in reports and a manuscript submission is in progress.
- c) **Stakeholder Benefits (Impacts):** This work is being utilized by extension services to reduce pharmaceutical use during dairy production and therefore increase dairy product safety. Changes in drug usage during dairy production have been proposed. A determination of the impact of these findings is in progress.
- d) **Accomplishments Assessment:** The research component of this project has been successfully completed.
- e) **Source of Expenditures & Impact Scope:**  
**Funding Source-** USDA/CSREES Cooperative Agreement with Virginia Tech.  
**Scope of Impact-** State-specific, Multistate, and Integrated 1890 Extension & Research



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

**Executive Summary:** West Virginia is one of the most impoverished and least healthy states in the country. Obesity rates in the state are consistently higher than the national average. Since at least 1991, the Behavioral Risk Factor Surveillance Survey (BRFSS) conducted by the Centers for Disease Control and Prevention, has ranked West Virginia among the top five states for obesity prevalence. Obesity is a known risk factor for a number of chronic diseases and illnesses including hypertension, heart disease, stroke, some cancers, and diabetes. Obesity rates are high among West Virginia children too. But excess calories do not necessarily translate into adequate intake of nutrients and many adults and children are at risk for malnutrition, especially with regard to calcium, fiber, and vitamins A and C intake. Surveys to determine the current eating habits of children, especially with regard to food eaten away from home, have been administered to sixth graders in one West Virginia County. In addition, a series of focus groups are currently being conducted among four specific populations: seniors, parents, children, and working adults to determine beliefs and attitudes regarding barriers to healthy eating. Upon completion of the data collection, nutrition education programs will be developed for both adults and school-aged children.

- (A) Nutrition survey instruments have been designed, distributed to selected test populations of 6<sup>th</sup>-graders. Survey results have been compiled, analyzed and summarized. These findings are being used in the subsequent program-design phase of this project.
- (B) The project has progressed to the stage where nutritional survey data is currently being used to design better nutrition programs for WV secondary school students. Since changes in school nutrition programs are very recent the benefits to clientele and stakeholders is yet to be determined.
- (C) The Nutrition project is progressing and will be continued.
- (D) Resource Allocation: **Total Invested** - \$56,028  
**SY** - 0.25

### **Program 3.1: Human Health & Nutrition**

#### **Project 1: Nutrition Education in West Virginia**

**Description:** Staff from the Office of Nutrition and Health Education (ONHE), in conjunction with the Kanawha Coalition for Community Health Improvement, are involved in several research projects related to obesity among both adults and school-aged children. In the spring of 2004, all 6<sup>th</sup> graders in Kanawha County were surveyed about their eating habits at school; barriers to participation in the school lunch program, and beliefs about weight loss and dieting. In addition to the sixth grade survey, focus groups are being conducted throughout Kanawha County among four specific groups: seniors, parents, school-aged children, and working adults. The focus groups are

designed to gather information about beliefs and barriers regarding healthy eating. A total of nine focus groups will be conducted.

- a) **Results:** A total of 1,557 Kanawha County sixth graders completed the school survey. The data has been analyzed and will be presented to the stakeholders - school administrators, parents, school nurses, and the students. After the presentations, volunteers will be recruited to form work groups charged with designing programs to improve the nutrient content of foods served and consumed at school. Information obtained from the focus groups will be used to develop community education programs on nutrition and physical activity. In the future new models for nutrition education will be delivered, evaluated for effectiveness and ranked for further development.
- b) **Successes Resulting in Change (Outcomes):** The project has progressed to the stage where nutritional survey data is currently being used to design better nutrition programs for WV secondary school students. Since changes in school nutrition programs are very recent the benefits to clientele and stakeholders is yet to be determined.
- c) **Stakeholder Benefits (Impacts):** This work has progressed to the stage where Kanawha County nutrition program administrators recognize that redesign of food service is warranted and recommended changes are currently being implemented.
- d) **Assessment of Accomplishments:** The work is progressing and should be continued.
- e) **Source of Expenditures & Impact Scope:**  
**Funding Source-** Evans-Allen (Section 1445), Community-Based Initiatives grant obtained through the West Virginia Department of Health and Human Resources, Bureau for Public Health.  
**Scope of Impact-** State-specific, 1890 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 formed a partnership with the Mid-Atlantic Water Quality group and is translating research findings into extension white papers for distribution on a manure-management web site. The environmental chemistry projects are not sufficiently mature to document benefits to clientele and stakeholders.
- (C) All projects are too new to document sufficient outcomes.
- (D) Resource Allocation: **Total Invested-** \$ 1,320,063  
**SY-** 8.00

#### **Program 4.1: Environmental Conservation and Remediation**

##### ***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. Although in its infancy, this research has already received recognition by earning a certificate for scientific achievement at a WV state government research festival.
  - 1. An oral presentation was given at the 2004 Annual WVSU Research Symposium, Institute, WV.
  - 2. A poster presentation on the "Setup and use of an inert atmosphere glove-box" was given at Research Day at the Capitol, Feb. 9, 2004
- 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.
  - 1. Received a *Certificate of Achievement in Scientific Research* from Governor Bob Wise in Feb 2004.
- c) **Stakeholder Benefits (Impacts):**
  - 1. Public presentation of this research has made Institutional endeavors better known to scientific community.

2. Establishment of a research collaboration on the attachment of these newly developed photocatalysts to proteins with Dr. Karen J. Brewer, Department of Chemistry, Virginia Polytechnic Institute and State University, Blacksburg, VA has strengthened this promising venture.
- 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:** This research has investigated several routes to generate precursors (diphosphine oxides) to the desired end-products (water soluble phosphine ligands). Preliminary structural characterization suggests the product yields are too low to be economic. Testing alternative routes of synthesis that eliminate the handling of an explosive precursor by employing a reaction scheme that generates this precursor *in situ* are in progress.
  1. An oral presentation was given at the 2004 Annual WVSU Research Symposium, Institute, WV.
  2. A poster presentation showcased the Inert Atmosphere Glove-Box (WV EPSCoR supported), newly acquired research and training equipment at Research Day in the Capitol, Feb. 9, 2004.
- b) **Successes Resulting in Change (Outcomes):** This work is not sufficiently mature to show outcomes beyond research results.
- c) **Stakeholder Benefits (Impacts):** Once established the project promises to address the remediation of water contaminated by acid mine drainage associated with the coal mining activity in West Virginia.
- 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: Microbiology**

### **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 our pilot plant digester to study its capacity to be controlled using biochemical parameters known to be effective. We proposed testing the effect of temperature, frequency of mixing, and frequency of feeding on digester performance, then to develop a feedback-control program that is sensitive to the studied parameters.
- 2)** The reduction in pathogens during digestion was studied, with a focus on *Giardia* and *Ascaris* species. We proposed to set up experiments that permit assessments of pathogen kill over time and demonstrated that the material remaining after known incubation times (equivalent to digester resident time) is not viable. An independent assessment of this work was provided by Waterborne Inc, New Orleans, LA.
- 3)** The feasibility of using microbial protein from anaerobically digested poultry litter, as a substitute for fishmeal in trout feeds will be established. The feasibility of the concept has been established using hybrid bluegill and now trout was tested.
- 4)** More effective digester control will result from an understanding of the relationship between biochemical control parameters and the resident microbial populations. This research is aimed at further understanding the microbial degradation processes that occur in thermophilic anaerobic bioreactors during the decomposition of agricultural waste. The long-term objective is to link microbial community structure and metabolism to bioreactor design.
- 5)** The organic materials resulting from thermophilic anaerobic digestion are known to have biological value. Data on the accumulation and depletion of various crop nutrients has allowed us to propose recommended practices for the use of digested litter solids and liquids as 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. Trials demonstrating the use of digested liquids as alternative fertilizers in hydroponic culture of tomatoes, lettuce and cucumbers will continue with emphasis on adjustments for successful cultivation.
- 6)** The commercialization of anaerobic digester technology and outreach of this information focuses on defining the economics of recycling the carbon and nutrients in a specific agricultural region. Currently, handling the biogas and land-application of the liquids and solids are major hurdles in making this technology economic. Several ongoing experiments address both economic components by evaluating biogas purification alternatives, determining the fate of pharmaceuticals in digested materials,

assessing the feasibility of using digested solids as a substrate for mushrooms and as a source for activated carbon filters.

a) **Results:**

**1. Operational parameters of the pilot thermophilic anaerobic digester.** Three pilot plant experiments were conducted last year. One compared the effects of temperature increases from 134 F to 142 F on digester performance. No significant change in biogas production, methane percentage or volatile solids (VS) destruction was observed. The second was a feed loading/energy balance experiment. As feed loading increased, efficiency of VS destruction and standard cubic feet (SCF) biogas/lb of VS loaded decreased. Methane percentage remained fairly constant (53-56%). The final experiment compared three feed loading frequencies at the same loading rate per day. The frequencies were 24-, 12- or 6- feed events per day. Methane % remained fairly constant between feed frequencies (53-56%). No difference was observed in biogas production between the first two rates: 5 SCF biogas/lb of VS loaded for both 24 & 12. However when fed 6 times per day, the digester yielded 6 SCF biogas/lb of VS loaded. Further investigations are needed to explain the increased biogas production when feed frequency is reduced.

**2. Monitoring the Loss of Viability of Pathogens in Livestock Residuals.** Experiments characterized the viability of both *Giardia muris* and *Ascaris suum* in 1-liter thermophilic digesters and *A. suum* also in mesophilic digesters. Developmental inactivation of *A. suum* embryos was demonstrated within one hour using thermophilic anaerobic digestion. No developmental inactivation within a 24-hour period was demonstrated using mesophilic anaerobic digestion, when compared to the ambient control temperature. Staining assays have been initiated on the cysts of *Giardia muris* in order to investigate the effects of thermophilic anaerobic digestion on the viability of that species. These data further confirm that thermophilic anaerobic digestion is an effective means to remove these protozoan intestinal taxa and certain nematodes from animal waste streams.

**3. Formulating Aquaculture Feeds from Digested Poultry Litter.** Fifty kilograms of digester microbial protein was characterized for nutritional value including amino acid and metal content. Experimental feed rations have been formulated and a 90-day rainbow trout feed trial was initiated to determine the nutritional quality of protein recovered from the thermophilic anaerobic digestion of broiler litter utilizing wood chips as a base. Six diets were tested with 0%-25% protein in feed being derived from digester microbial protein with the balance being casein. Unlike hybrid bluegill that responded positively to feed that contained 20% digested solids in its protein fraction, trout showed inhibition of growth at 5% replacement. Therefore, the efficacy of supplementing feed with protein obtained from anaerobic digesters will be fish species specific.

**4. Linking Microbial Community Structure to Function in Thermophilic Anaerobic Digesters.** The molecular diversity work conducted during the last two years on the pilot plant digester has revealed a bacterial community that is more diverse than other studies have shown. Several experimental strategies have refined the methodology to provide higher resolution analysis of species diversity than previous techniques.

This is a significant development because we are now able to ascertain microdiverse relationships within the bacterial phylotypes of the digester community. The two primary bacterial groups present are the orders Clostridiales and Bacillales which is consistent with the earlier rDNA library. However, significantly more diversity was found in the Clostridiales including many clones that are not even closely related to characterized genera or families. Our study has demonstrated that an analysis of digester bacterial diversity requires sampling through time and DNA sequence rather than RFLP analysis to ascertain phylogenetic relationships.

The diversity of antibiotic resistant bacteria in poultry litter and digester effluent was also examined. Experiments addressed the diversity of tetracycline resistant bacteria in poultry litter compared to digester effluent, and also evaluated whether thermophilic anaerobic digestion reduces the antibiotic resistance burden on American farms. A collection of more than 100 aerobic tetracycline resistant isolates was made from poultry litter and digester liquid. Preliminary analysis with PCR has identified the presence of *tetM* in some of the tetracycline resistant isolates.

A laboratory-scale fluidized bed digester was initiated and run for four months on filtered poultry litter substrate at a gradually increasing rate. Metabolic and microbial data is being compiled.

**5) Evaluating digester effluent as organic fertilizer and developing production systems.** Field trials continued to test the effluent as an alternative fertilizer. Raised beds treated with effluent show a statistically significant amount of available and reserve phosphorus. Effluent applied at 2x rates also showed statistical significance over all other treatments for magnesium, zinc, copper, and manganese. Potato fresh weight was significantly different for 2x effluent over the other fertilizer treatments. Liquid effluent applied at twice the recommended nitrogen rate was statistically the best treatment for number of marketable tomatoes produced per plant. The 2x effluent on tomatoes produced 3 times the weight compared to the other treatments. The fresh weight of broccoli was statistically the same for the 1x effluent and the chemical fertilizer. Blueberries did not show any fertilizer effect and this may be due to the fact it is a perennial crop. The turf and hay trials showed statistically significant responses from the control and two conventional fertilizers. Liquid effluent continues to show promise as an alternative fertilizer for hydroponic lettuce production; however trials with several varieties need to be replicated. Balancing the nitrogen forms ( $\text{NO}_3/\text{NH}_4$ ), adding magnesium and a chelator to the effluent produced more tomatoes than those with a commercial fertilizer and a lower percentage of cull fruit were produced.

**6) Commercialization and outreach of Anaerobic Digester Technology.** First, the evaluation of alternative hydrogen sulfide removal systems has focused on liquid phase chemisorbents as this technology is the most efficient and cost effective solution for sulfur removal in biogas. Second, the effectiveness of digesters at destroying 17-beta estradiol and oxytetracycline is in progress. Third, evaluations of the suitability of growing mushrooms on digested solids are in progress. Fourth, two experiments tested the effect of digester liquid on soil ecology and plant growth. Nematode indemnification and counts in soil samples are being conducted at West Virginia University. Lastly the commercial value of liquids, solids and biogas that result from the digestion of livestock wastes continues to be researched by locality. We have defined novel commercial uses of the effluent solids and liquids and the information required to assess their economic

potential will be gathered for use in future economic analyses. The value of energy and green power, fertilizers, crop markets, and pollution credits are defined by locality. Future work will develop a ranked list of potential regional digester sites based on the distribution of livestock producers and the associated wastes. Another objective will be to identify all factors that should go into this economic model. Finally white papers will be developed to facilitate decisions on when and what type of digester technology is appropriate for the management of livestock residuals in a given situation.

### **Posters, Publications and Presentations:**

1. Bombardiere, J, Liedl, BE, Williams, ML, and JM Chatfield. 2004. Poultry waste treatment for fertilizer production using thermophilic anaerobic digestion. at the 10th World Congress - Anaerobic Digestion 2004 Anaerobic Bioconversion for Sustainability in Montreal, Canada from August 29-September 2, 2004. **[poster]**
2. Liedl, BE, Cummins, M, Young, A, Williams, ML and JM Chatfield. 2004. Hydroponic Lettuce Production Using Liquid Effluent From Poultry Waste Bioremediation As A Nutrient Source. ISHS Protected Culture in a Mild Winter Climate Symposium. March 23-27,2004. **[oral presentation, & abstract]**
3. Liedl, BE, Cummins, M, Young, A, Williams, ML and JM Chatfield. 2004. Liquid Effluent From Poultry Waste Bioremediation As A Potential Nutrient Source For Hydroponic Tomato Production. ISHS Protected Culture in a Mild Winter Climate Symposium. March 23-27, 2004. **[poster & abstract]**
4. Liedl, BE, Cummins, M, Young, A, Williams, ML and JM Chatfield. 2004. Liquid Effluent from Poultry Waste Bioremediation as a Potential Nutrient Source for Hydroponic Tomato Production. Acta Hort. 659:647-652. **[publication]**
5. Liedl, BE, Cummins, M, Young, A, Williams, ML and JM Chatfield. 2004. Hydroponic Lettuce Production Using Liquid Effluent from Poultry Waste Bioremediation as a Nutrient Source. Acta Hort. 659:721-728. **[publication]**
6. Liedl, BE, Bombardiere, J, Williams, ML, Stowers, A, Postalwait, C, and JM Chatfield. 2004. Solid Effluent from Thermophilic Anaerobic Digestion of Poultry Litter as a Potential Fertilizer at the 2004 Annual Meeting of the American Society of Horticultural Science in Austin, Texas from July 17-20, 2004. **[presentation]**
7. Liedl, BE, Bombardiere, J, Mazzaferro, K, and JM Chatfield. 2005. Liquid Effluent from Thermophilic Anaerobic Digestion of Poultry Litter as a Potential Fertilizer at the 2005 Annual Meeting of the American Society of Horticultural Science in Las Vegas, NV from July 18-21, 2005. **[submitted abstract]**
8. Liedl, BE, Bombardiere, J, and JM Chatfield. 2005. The Fertilizer Potential for Liquid and Solid Effluent from Thermophilic Anaerobic Digestion of Poultry Waste at the 4<sup>th</sup> International Symposium on Anaerobic Digestion of Solid Waste in Copenhagen, Denmark from August 31-September 2, 2005 **[submitted abstract]**
9. Ruhnke, TR and M Easter. 2004. Effects of Thermophilic Anaerobic digestion on the infective stages of *Cryptosporidium muris*, *Giardia muris*, and *Ascaris suum*. Presented at the 2004 meetings of the American Society of Parasitologists and the American Association of Veterinary Parasitologists, Philadelphia, PA. **[poster]**
10. Ruhnke TR, Stafford D A, Wetzel S and M. Easter. 2004. The important control of bacterial, protozoan and helminth pathogens using thermophilic anaerobic digesters.



2004. 10th World Congress - Anaerobic Digestion 2004 Anaerobic Bioconversion for Sustainability. August 29 - September 2, 2004 Montréal (Canada). **[poster]**

11. Saraswathy, A, D Stafford, M Chatfield, and DH Huber. 2004. A study of three thermophilic anaerobic digester types with poultry substrate feed. Proceedings of the 10<sup>th</sup> World Congress on Anaerobic Digestion, Vol. 3, pp. 1822-1825. **[publication]**.
12. Saraswathy, A, D Stafford, M Chatfield, and DH Huber. 2004. A study of three thermophilic anaerobic digester types with poultry substrate feed. 10<sup>th</sup> World Congress on Anaerobic Digestion, Montreal, 2004; **[abstract & poster]**
13. Saraswathy, A, A Smith, H Hubbard and DH Huber. 2004. Molecular bacterial diversity of a thermophilic anaerobic digester treating poultry waste. American Society for Microbiology 104<sup>th</sup> General Meeting, May 23-27, New Orleans, LA, **[abstract & poster]**
14. Smith, A, H Hubbard, and DH Huber. 2004. Archaeal diversity of a thermophilic methanogenic pilot scale digester treating poultry farm waste. 10<sup>th</sup> World Congress on Anaerobic Digestion, Montreal, 2004; **[abstract & poster]**
15. Smith, A, H Hubbard, and DH Huber. 2004. Archaeal diversity of a thermophilic methanogenic pilot scale digester treating poultry farm waste. Proceedings of the 10<sup>th</sup> World Congress on Anaerobic Digestion, Vol. 3, pp. 1574-1577. **[publication]**.

b) **Successes Resulting in Change** (Outcomes): Three stakeholders, both in energy businesses wish to develop marketable products using the biogas from our pilot plant digester. Joint funding proposals are under development.

c) **Stakeholder Benefits** (Impacts): This research and demonstration project has received enough attention at regional, national and international meetings to attract stakeholders from several states including VA, MD, MS, SC, NE, and PA. Several groups interested in regional and industrial digesters technology have visited the project and incorporated our technology into their designs for future digesters. Project personnel have formed a partnership with the Mid-Atlantic Water Quality group and are translating research findings into extension white papers for distribution on a manure-management web site.

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

<b>Goal 5:</b> To enhance the economic opportunities and quality of life among families and individuals...
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**Note:** Executive Summary fully described in the Cooperative Extension Section

**Resource Allocation:**            **Total Invested-** \$53,400  
**SY-** 0.25

### **Program 5.1:** Regional Economic Forecasting

#### **Project 1:** *Community Asset Mapping Research* **(Extension)**

**Description:** WVSU is working to identify community strengths using asset mapping techniques and the 1890 “Community Voices” leadership development curriculum. We are developing a systemized approach to analyzing the community economies to identify potential options for creation, attraction, retention, or expansion of jobs and income opportunities. This target industry analysis will be combined with community assessment and planning and with the results of an environmental scan, done by the WVSU Community and Technical College, to produce a forecasting model and employability study, which can be applied to the West Virginian economy. Analytical tools and community planning tools are utilized to enhance community decision-making and to incorporate local desires and ideas. The results of this research will help guide us in our extension programming.

- a) **Results:** The preliminary data from the three county areas is being evaluated from the employability study. Raw local data for the LOCI studies has been obtained. Staff will format and input into a database in order to run the analyses. Although this research is still in the preliminary stage, eventual impact will be the empowerment of key decision makers to effect positive change on their local economies.
- b) **Impact:** We have established partnerships with the faith-based community and other community groups as a point of entry into the under-served areas of the Kanawha Valley to do this analysis. In addition, we are assessing areas of need in urban and rural parts of West Virginia. WVSU ACEOP and the West Virginia Research League are working to complete a project, which will include a detailed target industry analysis for Clay, Kanawha and Putnam Counties. In addition to the employability study, staff from the Department of Community Resource and Economic Development has been trained to run Local Economic Impact Analysis (LOCI) studies, using software developed by Georgia Technological University.
- c) **Stakeholder Benefits (Impacts):** The results of this research will ultimately help community leaders predict changes in local output, employment and income resulting from changing economic conditions.
- d) **Source of Expenditures & Impact Scope:**  
Funding Source- Evans-Allen (Section 1445)  
WV EPSCoR – International Innovations  
Scope of Impact- State-specific, 1890 Research

## SECTION III. West Virginia State University Extension

**Table 1** WVSUE Programs: Summary of Resource Allocation by Goal and Program

### WVSU EXTENSION PROGRAMS

ANNUAL ALLOCATION OF RESOURCES (FY 2004)								
NATIONAL GOAL / INSTITUTIONAL PROGRAM		FUNDING SOURCE						
Goal	Program Area	Federal Formula	Federal Other	State Match *	State Other	Other	TOTAL	FTE
<b>GOAL I</b>								
Program 1.1	Alternative Agriculture Extension and Education	102,711	0	51,356	0	10,000	164,067	1.25
Program 1.2	The Expansion of Horticultural and Forestry Activities in West Virginia	97,781	10,000	29,334	0	0	137,115	1.25
	<b>Total</b>	<b>200,492</b>	<b>10,000</b>	<b>80,690</b>	<b>0</b>	<b>10,000</b>	<b>301,182</b>	<b>2.50</b>
<b>GOAL II</b>								
Program 2.1	Food Safety and Allergy Awareness	77,781	0	22,556	0	0	100,337	2.00
	<b>Total</b>	<b>77,781</b>	<b>0</b>	<b>22,556</b>	<b>0</b>	<b>0</b>	<b>100,337</b>	<b>2.00</b>
<b>GOAL III</b>								
Program 3.1	Nutrition Education and Wellness System	136,983	13,633	68,491	0	0	219,107	2.25
	<b>Total</b>	<b>136,983</b>	<b>13,633</b>	<b>68,491</b>	<b>0</b>	<b>0</b>	<b>219,107</b>	<b>2.25</b>
<b>GOAL IV</b>								
Program 4.1	Biotechnology and Environmental Science Outreach	0	0	0	0	0	0	0
	<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.00</b>
<b>GOAL V</b>								
Program 5.1	Youth Development	215,599	172,944	107,799	5,000	20,000	521,342	7.00
Program 5.2	Family and Community Education	141,330	0	56,532	0	0	197,862	2.00
Program 5.3	Community And Economic Development	251,365	175,000	94,513	61,386	24,000	606,265	5.50
	<b>Total</b>	<b>608,294</b>	<b>347,944</b>	<b>258,845</b>	<b>66,386</b>	<b>44,000</b>	<b>1,325,469</b>	<b>14.50</b>
<b>GRAND TOTAL</b>		<b>\$ 1,023,549</b>	<b>\$ 371,577</b>	<b>\$ 430,582</b>	<b>\$ 66,386</b>	<b>\$ 54,000</b>	<b>\$ 1,946,095</b>	<b>21.25</b>

\* State match appropriations spent between October 1, 2003 thru June 30, 2004

### WVSU Extension Overview

Extension and outreach programs are currently offered, in a consistent basis, to approximately 15 counties within the state. 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 almost 4 years of service, many of these programs have already had a profound impact on those individuals and communities we served. 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 and the impacts they had on the communities and stakeholders served in FY 2004. Table 2 summarizes the funding invested in each goal and program of the institutions' plan of work for fiscal year 2004.

**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, West Virginia State University has addressed these needs by placing an Agriculture and Natural Resources Extension Agent in a county office setting. Additionally, residential horticulture and pest control are increasing areas of interest throughout West Virginia and across the country.

<b>Total Invested -</b>	Federal Formula Funds	\$ 200,492
	Other Funds	\$ 100,690

**FTE** 2.5

**Key Theme:** Residential Agriculture

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

### **Young Farmers Meetings**

- a) **Description:** The United States Department of Agriculture Economic Research Service (USDA/ERS) showed that West Virginia is the number one state in the country for percentage of family farms, followed by Alabama and Oklahoma. Individuals/families run 96.4 percent of the Mountain State's farms. To address the needs of this constituency, WVSUE has partnered with the citizens of Roane County and placed a full-time Extension Agent in the field of Agricultural and Natural Resource. 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 developed Young Farmer meetings. There have been ten meetings scheduled and four Young Farmer meetings already completed. The completed meetings went as follows: Stephen Boyles, Ohio State University Extension Beef Specialist, was the speaker at our first meeting on the topic of "Livestock Handling Facilities". It helped to better educate them in the importance of facility design, cattle temperament, behavior patterns, and quality assurance. Dr. Dan Cain, the local large animal veterinarian, spoke on "Proper Vaccination Techniques, Vaccinations You Should Consider, and Available Vaccines". This

topic really stressed the importance of reading label for placement of vaccines, beef quality assurance, and the importance of knowing what vaccines should be a priority in your own cattle herd. There were a total of seven members present for this meeting. Sam Sheets representing the United States Department of Agriculture Natural Resource Conservation Service and Jeff Thorn from the United States Department of Agriculture Farm Service Agency spoke on the available programs that the United States Department of Agriculture had to offer agriculture producers. Sam Sheets focused on the EQUIP Program, the West Virginia Conservation Agency Lime Program, and the Agriculture Management Assistance Program. Jeff Thorn concentrated his portion of the presentation of the Conservation Reserve Program, the Non-Insurable Crop Assistance Program, and the new formulation of AGR-Lite Insurance for crops and farms. There were a total of eighteen producers that were in attendance for this meeting. The final meeting for this year was an informative session given by the Roane County Calf Pool President, Paul Cummings, on the "Marketing Benefits and Rules of the Roane County Calf Pool". This program made members more aware of several different marketing strategies for livestock such as cattle and sheep were discussed. The sole focus of this program was on cattle in Roane County. There were a total of fifteen producers in attendance for this meeting. The upcoming meetings will be : Dr. Joe Starcher, West Virginia Department of Agriculture State Veterinarian, will be speaking on the "Electronic Animal Identification System". Wayne Wagner, West Virginia University Extension Agent, will be speaking on "Mineral Supplementation for Beef Cattle". Steve Boyles, Ohio State University Extension Specialist, will be speaking on "Feeding Your Female Employees, Beef Cattle Nutrition". Jim Ashley, Roane County Dairy Farmer, will be speaking on "Grass-Based Dairy Farming in Roane County". Dr. Keith Inskeep, Professor of Physiology and Endocrinology, will be speaking on "Increasing Farm Income by Strategic Shift in Breeding Time for Ewe Flocks". Bob Hindershot, United States Department of Agriculture/Natural Resource Conservation Service Grassland Management Specialist, will be speaking on "Forage Quality When Winter Grazing". It was the responsibility of the Extension Agent to coordinate all of the meetings and speakers for the Young Farmer Meetings.

- c) **Outcomes:** Due to the Young Farmer Meetings, Roane County producers are better informed on up-to-date agricultural information and programs.
- d) **Impact:** There was a total of 53 producer contacts made by the extension agent about information that will help farmers to be more effective, efficient, and be more competitive in the current marketplace.
- e) **Funding Source-** Federal and State  
**Scope of Impact-** County and State-specific

## 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 placed operated the Roane County Calf Pool for the last two years in cooperation with local agriculture interests and West Virginia University Extension Services.
- b) **Outputs:** The Extension Agent helped to coordinate Roane County's Calf Pool program. This local effort creates an opportunity to increase the genetics within Roane County's cattle herds by eliminating animals with less superior genetics and replacing them with a higher quality breeding stock. Sixteen local producers took part in this year's effort.
- c) **Outcomes:** Eliminating animals with inferior genetics and replacing them with a higher quality breeding stock and generating additional income for Roane County producers. People are more informed about agricultural practices, programs, and prevention through the Roane County newspaper.
- d) **Impact:** Sixteen local producers took part in this year's effort and marketed 261 cattle at above average market prices and produced \$157,866.21 in revenue for local producers. Preliminary numbers show this total to represent approximately \$8,000 in additional profit from the pool of animals that will be injected into the Roane County's economy.
- e) **Funding Source-** Federal and State  
**Scope of Impact-** County and State-specific

### Youth Livestock Program

- a) **Description:** While West Virginia is the number one state in the country for percentage of family farms, fewer and fewer youth today are exposed to agricultural programs. In Roane County, to continue youth's knowledge of the agriculture industry, a youth livestock education program including show and sale is coordinated every year.
- b) **Outputs:** The Extension Agent worked with the 4-H Livestock Club, where presentations were given on livestock nutrition, livestock confirmation, breed selection, showmanship, and the 2004 Rules and Regulations for the Livestock Show and Sale. There were a total of 33 4-H members present for this training session. The Extension Agent also helped train the new up-coming 4-H Club Presidents. Topics discussed were the importance of having control of the meeting, parliamentary procedure, and the duties expected of the President. This training session allowed youth members to get a better grasp on the commitment that will be involved with this position, will provide more structure in the meeting room, and hopefully a more productive 4-H Club. There were a total of ten participants in the training session. 4-H Home Visits were made to give first year

participants guidance to for the proper care, nutrition, shelter/structure, responsibility, and handling of their livestock projects. Because of this, the Roane County Showmanship contest was very competitive due to the proper handling of the livestock, the overall demonstration, and the abundance of project knowledge. Programs such as this one built confidence in the parents and participants of the 4-H livestock projects. The Extension Agent was also responsible for the development and implementation of the Roane County 4-H Livestock Show and Sale.

- c) **Outcomes:** The 4-H Livestock Show and Sale stresses agriculture education even further by making youth the livestock producer of a single agricultural animal. These youth are learning responsibility, livestock nutrition, dedication, and public exhibition.
- d) **Impact:** Since the Extension Agent began in Roane County there have been a total of 186 4-H and FFA livestock projects exhibited. The program has also generated a total of \$89,953.00 in the 2004 Livestock Show and Sale.
- e) **Funding Source-** Federal and State  
**Scope of Impact-** County and State-specific

### **Program 1.2: *The Expansion of Horticultural and Forestry 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 Agent. 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 have a prime role in the delivery of research-based knowledge to the citizens of their county. Primary delivery methods include fact sheet distribution, newspaper articles, and appearances on local radio. They are also responsible for the development of that research. 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 more than twenty Roane County residents' homes/farms for observations, interpretations, diagnostics, and explanations on plant diseases, insect problems, irregular plant growth, 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. The Extension Agent also presented the Pesticide

Recertification Class for eight Roane County Residents. Eight 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 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.
- d) **Impacts:** The eight Pesticide Recertification participants had a 16.6% increase on their average score from the pre-test to the post-test covering the topics of pasture management, beef cattle parasite control, weed identification and eradication, West Nile disease prevention, and record-keeping.
- e) **Funding Source-** Federal and State allocations  
**Scope of Impact-** State and county specific

#### **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 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 begun collaborating 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 the evaluations on year one analysis and awaiting the new growth results.
- 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 first year of analysis on the research plots and is awaiting the new growth analysis in the spring. Several of the research plots exhibited a significant decrease in the live presence of Japanese Knotweed.
- e) **Funding Source-** Federal and State allocations  
**Scope of Impact-** State and county specific



#### 4A Pesticide Certification

- a) **Description:** Within forestry and horticulture professions training on proper pesticide handling and application are mandated by state government. The Department of Agriculture Pesticide Division serves the population by offering numerous free trainings on such topics, but it's 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 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 in early January of 2004. This training is usually offered only in the northern region of the state and agriculturally based businesses in the southern region of the state have had problems sending their employees that far away to obtain the training required. Providing training in a more centralized location in the state accommodated the needs of these individuals. For this first training, 20 people were in attendance. In June of this year, the two entities joined forces again to offer Worker Protection Standard Trainings on the campus. At this time 10 employees with the WVSU grounds maintenance and 3 from the Bioplex agricultural research division were trained on proper pesticide handling and application, as well as tractor operation. The third training this year was directed toward Registered Pesticide Dealers to train the employees of retail stores, like Lowe's, proper directions to give to customers about pesticide labels and application methods. This training was attended by 9 individuals from various greenhouse and retail outlets.
- 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 students who work within the agricultural research at Bioplex also benefit from this cooperation by the certifications they receive in various areas from this program. Holding such a certification may provide them with a stepping stone into a position that they may not have obtained otherwise. The Dealer Training also reduces the liability of the retail outlet for accidents that in the past may have resulted from improper directions by a sales associate.
- 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, which covers planning, designing, establishing, maintaining, regulating, treating, conserving, and protecting of woody vegetation in urbanized areas. Because of its closeness 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, tree commissions, 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%. The quality of life is dependent upon the urban environment. Healthy, safe and effective 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 in education of citizen groups, children, professionals, municipalities and agencies.
- (b) **Outputs:** Coordinated development of the 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 helped to further the program along in its development. A Pruning Workshop was hosted on the campus of WVSU by the WV Division of Forestry Urban Forestry Technical Specialist for 12 individuals from the WVSU staff. A second training was provided by the WV Division of Forestry State Office on the Project Learning Tree curriculum. This program has been developed to educate our youth about the environment and how to think about local and global environmental issues. This training was provided on the WVSU campus to 6 WVSU extension personnel and 11 WVSU education majors. West Virginia State University also supported a statewide West Virginia Arbor Day Celebrations with involved the planting of a tree in each county of West Virginia and Tree City. Finally, WVSU is working with the WV Division of Forestry Urban Forestry Technical Specialist to provide support for the publication of a booklet developed for the urban community on tree selection and site preparation.
- (c) **Outcomes:** The cooperation that has been developed between WVSU and the Division of Forestry has allowed for an increase in the dissemination of information about urban forestry and forestry in general 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. This cooperation has not only benefited the Division of Forestry, but it has also increased the knowledge and performance of

the staff of WVSU. 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, students majoring in education at WVSU have been introduced to an environmental curriculum that they may be able to utilize in their own classrooms upon graduation. The WVSU Extension and Physical Facility staff have also increased their knowledge of forestry practices which enables them to better serve the public or the WVSU campus on a variety of forestry related issues. 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 cooperation has also opened the door for further coordination of programs and projects which can only result in the expansion of knowledge of forestry issues throughout the service areas.
- (e) Funding Source:** Federal and State allocations  
**Scope of Impact:** State and County specific

### **Junior Master Gardener**

- a) Description:** Agriculture plays a major role in the daily lives of residents of West Virginia. In order to best prepare the youth of West Virginia for their futures, WVSU has begun working with the youth in Putnam County on the Junior Master Gardener Program. The curriculum that accompanies this program covers topic areas such as plants, soil, water, insects, environment and ecology to name a few. These subjects are, in many cases, 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 registered Junior Master Gardener groups were established at Buffalo Elementary School to educate the kindergarten and 4<sup>th</sup> grade students about horticulture and the environment. In all, 76 youth were involved in the program. The students also created an organic garden, which they managed throughout the summer, as well as designed and constructed a wildlife habitat on the school grounds. At the end of the school year 35 students from the 4<sup>th</sup> grade were medaled in the topics of "Plant Growth and Development", "Soils and Water" and "Ecology and Environmental Horticulture". All 76 of participants in the Junior Master Gardener program received certification as "Wildlife Gardeners".
- c) Outcomes:** By educating youth in the various aspects of agricultural production and environmental stewardship, the awareness level in these topic areas increased dramatically. The students learned through hands on exploration about fruit and vegetable production in their own garden, as well as through numerous activities within the classroom. During this learning process the

students started their own plants from seed and vegetative propagation, which they later sold for fundraising efforts to support the Junior Master Gardener program within their own school.

**d) Impact:** With the support of WV Agriculture Commissioner Gus Douglass, a garden hose cutting ceremony was conducted to christen the addition of a small greenhouse to the school grounds at Buffalo Elementary. The presence of the Commissioner of Agriculture brought in local newspaper and television media coverage to the event. This exposure to the new Junior Master Gardener program increased the visibility of youth agricultural education. The greenhouse was utilized by the students to raise tomatoes, nasturtium, and mint which were then sold in a fundraising effort. This fundraiser brought in around \$50.00 which was then spent on tools such as a wheelbarrow and hand trowels which were used in the garden during the summer months. In addition, due to the hard work of the 4<sup>th</sup> grade group at Buffalo Elementary, the WV Diggers were also chosen as the National Group of the Month for the month of May by the Junior Master Gardener National Headquarters out of Texas A & M. This national recognition has put West Virginia on the map as an up and coming state for youth gardening initiatives and has also placed WVSU as an integral part in the expansion of the Junior Master Gardener curriculum throughout the state of West Virginia.

**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. 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.

<b>Total Invested -</b>	Federal Formula Funds	\$ 77,781
	Other Funds	\$ 22,556

**FTE – 2.0**

## Program 2.1: Food Security

- (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) develops the menus used for the program and then contracts with the WVSU food service department for the preparation and packaging of the meals. The ONHE hires part-time summer staff for monitoring of the program and delivery of the meals. The SFSP is 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:** ONHE provided lunches to twelve sites and one 4-H camp in the summer of 2004. A total of 14,409 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

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

### Executive Summary:

West Virginia consistently ranks higher than the rest of the nation for incidences of chronic diseases, such as cardiovascular disease, stroke, and diabetes. The incidence of obesity is well above the national average in both children and adults. The Office of Nutrition and Health Education (OHNE) provides a variety of programs designed to prevent chronic disease and improve the quality of life for West Virginians with chronic illnesses. In 2004, the areas of focus were health literacy for senior citizens, diabetes education, obesity awareness and prevention for both children and adults, and continuing education for dietetic professionals.

<b>Total Invested</b> – Federal Formula Funds:	\$136,983
Other Funds:	\$ 82,124

**FTE** – 2.25

<b>Program 3.1:</b> Nutrition and Health Education Programs
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### **Health Literacy Project**

- (a) **Description:** The ONHE developed a health literacy program for seniors through collaboration with the WVSU Sociology and Health and Human Performance Departments. The project began with a research study at a local hospital outpatient health clinic. Data was collected on 140 patients immediately following their visit with their respective physician to determine their perception of the communication process. Students in a Sociology class at WVSU performed the interviews, data collection and data analysis. Once the data was analyzed, students from two Health and Human Performance classes conducted four focus groups at area senior citizen sites. Using the information received from the patient interviews and focus groups, students created a curriculum designed to educate and empower senior citizens to be more involved in their health care decisions. A personal health journal was also developed for seniors to record all relevant health history, insurance information, medication usage, and medical test results. Taking the journal to medical appointments helps seniors provide more accurate information to their health care providers.
- (b) **Outputs:** There were seven pilot programs held in four West Virginia counties. 94 seniors received the training.
- (c) **Outcomes:** 100% of the participants reported an intention to use their Personal Health Journal at their next doctor's appointment. 92.5% of the participants gave the program the highest rating for effectiveness and 89% said they would like to participate in another program on this topic.
- (d) **Impacts:** The health literacy project empowers participants to take a more active role in their disease management by asking questions, considering alternative treatments, and improving self-efficacy.
- (e) **Funding Source:** Smith-Lever Section 1444 Funds, State of West Virginia  
**Scope of Impact:** State Specific

### **Diabetes Education**

- (a) **Description:** Staff of the ONHE provided education about diabetes management through interactive cooking schools. Participants were enrolled through hospital support groups, low-income medical clinics, and churches. The program is provided in three weekly, two-hour sessions. The educational portion is delivered by a registered, licensed dietitian and the cooking component is provided by a Master's degreed extension agent. A 3-month follow up session was provided at each site to reinforce the educational concepts.

- (b) **Outputs:** Three 3-week classes were held in two counties. A total of 99 people attended the sessions.
- (c) **Outcomes:** Between 10-15% of participants demonstrated an increase in knowledge regarding healthful sources of fat, carbohydrate replacements, and alternatives to salt for seasoning food. In addition, participants reported positive attitude and behavior changes three months after completing the program. 8% of participants felt more empowered to control their disease, 18% read food labels more often, 7.5% decreased salt usage at the table, and 10% increased their daily intake of fruits and vegetables to the recommended five per day.
- (d) **Impacts:** The skills necessary to manage diabetes involve many areas, such as meal planning, food preparation, and label reading. Participants in the diabetes education programs are better equipped to manage their disease through meal planning and preparation.
- (e) **Funding Source:** Smith-Lever Section 1444 Funds, State of West Virginia  
**Scope of Impact:** State Specific

### **Obesity Awareness and Prevention**

- (a) **Description:** The ONHE staff were involved in numerous projects focusing on obesity. One such program, *Run Obesity Out of West Virginia*, was a state-wide endeavor coordinated by various agencies throughout the state, including the ONHE. The event highlighted the resources available in local communities to combat obesity. Staff from ONHE were heavily involved in local activities, as well. The ONHE Specialist chairs the Obesity Work Group for the Kanawha Coalition for Community Health Improvement. The Coalition is focusing its efforts on childhood obesity and the role of public schools, communities, and families in providing nutrient dense, lower calorie foods. In 2004, the Coalition developed and executed a nutrition survey of all sixth graders in the county. The data will be used to develop strategies to improve the nutrition environment in the schools. Information will also be provided to parent groups. In addition, members of the Coalition developed an educational program called Healthy At Any Size. The program targets adults who have attempted numerous diets with little success. The goal of the program is to convince participants to stop “dieting,” and instead focus on making improvements in their health. Participants are encouraged to adopt three behaviors – healthy eating, increased physical activity, and self-esteem building. The program was offered at various worksites in 2004.
- (b) **Outputs:** The *Run Obesity Out of West Virginia* program raised awareness about community-based obesity/health education programs at seven community health fairs held throughout the state. At least 230 health fair attendees completed a survey about the exercise and eating habits. With the help of the Kanawha Coalition for Community Health Improvement, 1,557 6<sup>th</sup> graders were

surveyed about their eating habits at school and home. The Healthy At Any Size presentation remains popular. There were 13 presentations at area worksites with 148 employees attending the programs.

- (c) **Outcomes:** The *Run Obesity Out of West Virginia* event garnered much media attention through radio and television, thereby increasing listener and viewer awareness of health problems associated with obesity. In addition, a press conference and forum was held at a local children's hospital and featured several physicians, Congresswoman Shelley Moore Capito, the US Health and Human Services Deputy Secretary, and members of the local press corps. The 6<sup>th</sup> grade nutrition surveys are being analyzed and results will be publicized in the 2005 fiscal year. After completion of the Healthy At Any Size presentation, participants reported improvements in their attitudes toward dieting. Almost 100% of the participants documented the desired point of view regarding dieting and health after completing the program.
- (d) **Impacts:** Participants learned to take a more active role in their weight management through the Run Obesity Out of West Virginia event and the Healthy At Any Size presentations. The work being done by the Kanawha Coalition for Community Health Improvement is being used to draft legislation to limit vending machines in schools and increase physical activity in all grade levels.
- (e) **Funding Source:** Smith-Lever Section 1444 Funds, State of West Virginia  
**Scope of Impact:** State Specific

### **Continuing Education for Dietetic Professionals**

- (a) **Description:** The ONHE serves as a provider of the American Dietetic Association's continuing professional education programs. Facilities at the University provide the technological resources and meeting space necessary to deliver the programs to local professionals at an affordable cost. Programs were provided on fad diets, childhood obesity, and carbohydrate-focused diets.
- (b) **Outputs:** A majority of the registered dietitians in the state live near the WVSU campus. More than 30 RDs took advantage of the opportunity to receive continuing education hours provided by ONHE.
- (c) **Outcomes:** 100% of attendees at the ONHE-sponsored teleconferences received 2 continuing education units per session, thereby demonstrating increased participant awareness of the latest research and standards of practice.
- (d) **Impact:** Opportunities for continuing professional nutrition education are sometimes limited in West Virginia due to the rural nature of the state and the small number of registered dietitians. WVSU-ONHE has served as a catalyst to provide access to professional development opportunities.



- (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....

Program 4.1. Biotechnology and Environmental Science Outreach

This program was ceased in 2004 due to its low impact. New activities to address this goal were submitted in the new Plan of Work (2005-2006).

**Total Invested** – Federal Formula Funds: \$0  
Other Funds: \$0

**FTE** – 0

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

**Executive Summary:** Many youth, adults, and senior citizens in West Virginia are socio-economically vulnerable due to a lack of education, skills, or training. Many adult West Virginia residents presently lack the education and/or skill levels necessary to advance beyond minimum wage status. A survey conducted by the University of Charleston (WV) found that almost 60% of surveyed residents believe that further career development opportunities are needed for adults to achieve economic self-sufficiency (2002).

Many participants from limited resource communities also lack access to computers in their homes. Without this access, and the requisite skill set for utilizing computers, the economic prospects of community members will not improve. The key to bridging this digital divide is to provide community based centers where the various populations of youth, adults, and seniors can gain experience and skills through literacy and computer technology.

Additionally, many communities in West Virginia are suffering from irreversible downward employment trends in the coal, steel, and chemical industries. Workforce reductions in these industries have displaced thousands of workers in the last decade. These workers are generally highly specialized in their training and their skill set may not seem immediately applicable to transfer to another industry or endeavor. Education to broaden their skill sets or allow them to view their skills from a new perspective is vital to position West Virginia's economy for the 21<sup>st</sup> century. The youth of these communities often have negative views of their current situation and a very limited vision of future career prospects. Therefore, educational programs are provided to

empower individuals and families with opportunities to improve their respective qualities of life.

**Resource Allocation:**

<b>Total Invested -</b>	Federal Formula Funds	\$ 608,294
	Other Funds	\$ 717,175
<b>FTE -</b>	14.50	

**Key Theme:** Community Development

**Program 5.1:** *Technology and Literacy Education*

- (a) Description:** Providing educational outreach is a key component of our mission. There is a great need to develop 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. To that end, WVSU extension presently oversees or provides support for fourteen sites within Charleston that offers an array of technology literacy and life skills development programs. Four of the sites are located in community or faith-based sites, whereby WVSU, through a grant from the WV Higher Education Policy Commission installed computers at each of the location. WVSUE continues to financially support these sites through the provision of internet access and computer maintenance, as well as programmatic delivery. 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 \$250,000 program. There is a great need to develop 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, and financial literacy.
  
- (b) Output:** More than 90 literacy and technology programs were delivered to nearly 400 residents. 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. Three part-time staff members joined with the program coordinator to provide

regular weekly hours at each site, resulting in 264 hours of open access to the computer labs for the residents.

- (c) During this fiscal year, additional equipment was also purchased which effectively doubled the size of each lab resulting in greater accessibility. A Neighborhood Networks web page was also created, and linked to the Charleston Housing web site. The web page features recent activities, program descriptions and current schedules. Additionally, 15 volunteers provided more than 500 hours of service to the public housing based centers meeting their federally mandated needs for community service. In total, more than 964 hours of computer time (both instructional and open lab) were provided to residents.
- (d) **Outcome:** Fourteen community centers with computer labs were fully operational and providing technology access to more than 2000 low-income residents.
- (e) **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 on-line 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.
- (f) **Funding Source:** Housing and Urban Development Grant, Higher Education Policy Commission Grant, Federal and State Allocations  
**Scope of Impact:** State Specific

#### ***Program 5.2: Rural Business Services***

- (a) **Description:** This program was developed November, 2003, with a \$136,000 grant from the USDA and operates under the mission of the Rural Business Cooperative Service of outreach to small rural communities, delivery of Programs that will develop future entrepreneurs and businesses in rural American among those communities that have the most economic need. The program specifically targeted 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. A program coordinator was hired mid-November and is housed by the Summers County Commission in Hinton. Notification was received that the USDA awarded an additional \$75,000 for the continued support of this program.
- (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 economic development project focusing on the utilization of technology attended by over 100 community leaders from southern West Virginia; the sponsorship of a state-wide conference for the Specialty Foods cooperative that provided individualized business development assistance for 50 small businesses; and a multi-county training on customer service to work in conjunction with the development of a tourism opportunity in the area.

**(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 develop 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

**Program 5.3** *The Workforce Education and Career Assistance Network For You* ([www.wecan4u.net](http://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

### **Key Theme: Youth Education**

#### **Program 5.4 4-H Youth Development**

##### **Hip-Hop Boot Camp**

- (a) **Description:** The Hip-Hop Boot Camp is a 4-H program designed to give young people an idea of what it would be like to be a part of the music industry, whether in performance or production. The week-long camp provides opportunities for youth to learn more about dance, singing, rap writing, music production, filmmaking, photography, and other art-related topics. The Hip-Hop Boot Camp grew out of the desire to take 4-H, which has long been a well-respected program for rural youth, and transform it for a modern urban and minority audience.
- (b) **Outputs:** During the past year, Hip-Hop Boot Camp served 70 youth during the one-week summer camp. In addition, the camp engaged three teen youth and seventeen adults as counselors.
- (c) **Outcomes:** Through the experience, 100% of the students increased their knowledge of the music industry as a whole including dance, performance, and production. In addition, a post-camp survey indicated that, prior to attending the Hip-Hop Boot Camp, only 20% of the campers had ever heard of the 4-H program. Therefore, 80% of the campers increased in their knowledge of the 4-H program and its mission.
- (d) **Impact:** The demand for the camp has grown such that there is a need to expand to include another week of camp in order to accommodate students in

9<sup>th</sup>-12<sup>th</sup> grades who are interested in attending. In addition, 80% of 2004 campers indicated on a post-camp survey that they are interested in attending Hip-Hop Boot Camp 2005. In light of the success of Hip-Hop Boot Camp 2004, and the prospects for the 2005 camp, other organizations, both within our state and throughout the nation, are looking to the Hip-Hop Boot Camp as a model of a new way of reaching youth.

- (e) **Funding Source** - Smith-Lever Section 1444; The Greater Kanawha Valley Foundation; 304Live.com; 98.7, The Beat; Branch Bank & Trust; Embassy Suites  
**Scope of Impact** – County specific

### **WVSU Extension 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 15 youth volunteers in 7<sup>th</sup>-9<sup>th</sup> grades volunteer at the sites on a regular basis.
- (c) **Outcomes:** 48% 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 19% 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; funding from Multi-Cap, Inc.; 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 (HSTA) Program is a partnership between West Virginia University, West Virginia Rural Health Education Partnership and Appalachian communities. The HSTA Forensics Summer Institute also includes the West Virginia State Police Crime Lab as a partner. HSTA Summer Institutes bring minority and disadvantaged students and their teachers to campus each summer for clinical, laboratory, and classroom training and enrichment activities. During Forensic Teacher Training Week, teachers learn about different methods for gathering and analyzing forensic evidence. The teachers then take the information and methods they have learned and use them to guide groups of students through the same processes during Student Training Week. The students utilize the information that they are learning to solve a mock murder. The week culminates in each student group presenting its solution to the crime based on their findings from the evidence at the crime scene.
- (b) **Outputs:** The 2004 Forensics Summer Institute served 89 youth from throughout West Virginia. Sixteen West Virginia counties were represented. In addition, nine 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. 93% of students were satisfied with the Summer Institute. Over 76% of students indicated that the Summer Institute would have an impact on whether or not they would select a science or health-related career.
- (d) **Impacts:** The Health Sciences and Technology Academy encourages minority and underrepresented students to pursue careers in math, science, and health-related fields through engagement in experiential learning programs.
- (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

## Key Theme: Family Education

### **Program 5.5 : Adult and Family Education**

#### **Pregnancy Prevention**

- (a) **Description:** The Office 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, and skills required to raise an infant. It also encourages teens to wait to become parents until they are older and able to financially and emotionally care for children.
- (b) **Outputs:** Approximately 170 youth and adults have participated in Baby Think It Over®, which addresses parenting topics and pregnancy prevention.
- (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, (ages 17-21 years, who have earned their High School Diploma or GED certificate), 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 part of 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 and other members of the community and university also teach participants in both programs needed independent life skills.

- (b) Outputs:** Eleven residents participated in 34 independent life skills lessons to help prepare them for transition into the dormitories and other aspects of independent living. A total of 3072 contact hours have been spent with these residents that include case management services and 24-hour support from program assistants. On average, program participants received 22 hours of one-on-one time with the Case Manager per month.
- (c) Outcomes:** 33.3% of both HOUSE and Phase II students who were accepted into the program at it's inception continue to take classes on the campus, working towards their degree. At least four students (36.36%) have been dean's list participants, while 100% of the students completed their first semester. At least 40% of the students maintained a GPA of 2.0 or higher.
- (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

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