West Virginia State College

Annual Report of Accomplishments and Results

(FY 2003)

For Plan of Work FY 2000-2004

1890 Research & Cooperative Extension Programs

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Annual Report of Accomplishments and Results
- FY 2003 -

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SECTION I. INTRODUCTION

Report Summary

This report provides an update of the annual accomplishments for research and extension activities conducted by the 1890 Research and Cooperative Extension Departments at West Virginia State College (WVSC) for fiscal year 2003. As required by the agency, the report has been structured so it addresses the five national goals and the program key themes (or program areas). It also provides a summary of resources including personnel and financial allocations invested for each of these five national mandated goals and key themes. This annual report of accomplishments describes each of the 1890 research and extension programs and their impacts. Section II describes the accomplishments and results for the institution's 1890 Research Programs; whereas section III provides information on the Cooperative Extension Programs. An attachment which describes the collaborative endeavors between the State's 1890 and 1862 Land-Grant Institutions for FY 2003 has been added to this report as a means of information.

Institutional Updates

West Virginia State College was fully reinstated as an 1890 Land-Grant Institution in November of 2001. WVSC began the development and implementation phases of its research and extension programs in FY 2000 and 2001. During these initial years, the College was able to rebuild its programs and build capacity. 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 administrative and operational entity of the College to deliver its land-grant mission related to the dissemination of research, teaching, and extension services. The Division of ACEOP is now fully operational and has created and established reputable research, extension, and outreach programs within the state.

The fiscal support for FY 2003 was maintained at nearly the same level of funding as the previous years (approximately $1 M for extension and $ 1 M for research). The College, for the first time in its history, received state appropriated dollars to match 60% of its formula funding for FY 2004. This year, College administrators are again working on securing state appropriations and local funding to maintain and to further expand the reach of its Land-Grant Programs. As state appropriations and other funding are secured, the College has been capable of providing research and extension services to approximately 15 counties in the state.

Most recently, the State's Higher Education Policy Commission and its Legislature have granted the College university status. This change is very important because it represents an opportunity for the institution to expand its academic curricula and to extend its reach as it relates to the delivery of research and extension programs within 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 WVSC 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 College'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 also allows land-grant staff members to participate in the College'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 College.

Stakeholder Input and Environmental Scanning

WVSC 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 College 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 WVSC 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 will be responsible for evaluations. The internal and USDA-approved policies and procedures of the lead institution will be followed in the evaluation of multi or joint activities.

Collaborative Programs: 1862 & 1890 Institutions

West Virginia University (WVU) and West Virginia State College (WVSC) 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, WVSC 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 WVSC and West Virginia University are underway. Both institutions work diligently in collaborative efforts to avoid program duplication. A separate report documenting the current contribution of WVSC in this collaborative has been attached to this report.

SECTION II. 1890 COOPERATIVE RESEARCH PROGRAMS

Table 1 1890 Cooperative Research Programs: Summary of Resource Allocation by Goal and Program

1890 RESEARCH PROGRAMS

ANNUAL ALLOCATION OF RESOURCES *(FY 2003)*					
NATIONAL GOAL / INSTITUTIONAL PROGRAM		**FUNDING SOURCE**			
Goal	***Program Area***	***Federal Formula***	***Federal Other***	***State Match ****	***TOTAL***
GOAL I					
Program 1.1	Agricultural Biotechnology	100,685	13,766	14,854	*129,305*
Program 1.2	Alternative Agriculture	90,685	13,766	14,854	*119,305*
	Total	**191,370**	**27,533**	**29,708**	***248,611***
GOAL II					
Program 2.1	Plant and Animal Pathology	80,685	0	6,814	*87,499*
Program 2.2	Food Quality and Safety	70,685	7,731	6,814	*85,230*
	Total	**151,370**	**7,731**	**13,628**	***172,730***
GOAL III					
Program 3.1	Human Health and Nutrition	70,685	0	6,814	*77,499*
	Total	**70,685**	**0**	**6,814**	***77,499***
GOAL IV					
Program 4.1	Environmental Conservation and Remediation	196,202	244,130	14,954	*455,286*
Program 4.2	Microbiology	169,315	244,130	14,954	*428,400*
Program 4.3	Forest Management and Ecosystem Preservation	142,538	0	14,954	*157,492*
	Total	**508,055**	**488,260**	**44,862**	***1,041,178***
GOAL V					
Program 5.1	Regional Economic Forecasting	100,685	85,582	6,814	*193,082*
	Total	**100,685**	**85,582**	**6,814**	***193,082***
	GRAND TOTAL	***$ 1,022,166***	***$ 609,106***	***$ 101,827***	***$ 1,733,099***

* ***State match appropriations allocated between July 1 and September 31, 2003***

WVSC 1890 Cooperative Research Overview

West Virginia State College has worked diligently in the last four years to establish land-grant related research programs that are responsive to the critical needs prevailing in the state. In only 3 years, the College has implemented and advanced reputable programs within the scientific community. However, the College 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 within the state. The funding received for fiscal year 2003 was devoted to advancing the institution's 1890 research programs and to build research capacity. Faculty and qualified scientists 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 (e.g. Biotechnology) will provide our 1890 research programs an opportunity to employ graduate students to conduct 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 2003.

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. WVSC biotechnology research to determine the controls of plant cell division is continuing. 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. WVSC 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 are not sufficiently mature to show change within WV.

(C) These projects are not sufficiently mature to document benefits to clientele and stakeholders.

(D) All projects are too new to document sufficient outcomes.

Resource Allocation: $248,611
SY: 2.08

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 WVSC 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): This work is not sufficiently mature to show outcomes beyond research results.

c) **Stakeholder Benefits** (Impacts): This work is not sufficiently mature to show an impact on stakeholders.

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*

Description: 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.

Hydroponic greenhouse production of tomatoes is best with varieties bred for hydroponics. Field varieties are used in some locations, but their determinate plant growth habit makes them difficult to preserve over extended growing season and they require higher light and lower humidity than greenhouse varieties. In addition, the controlled environment 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 breeders select 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, our consumer tastes or resistance to our major pests.

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 varieties to use in tomato greenhouse production.

a) **Results**: This project is in its infancy (2 months) and substantial results have not been produced yet.
b) **Successes Resulting in Change** (Outcomes): This work is not sufficiently mature to show outcomes.
c) **Stakeholder Benefits** (Impacts): Greenhouse tomato varieties developed will assist West Virginia and southern greenhouse tomato producers to increase their competitive edge in production of tomatoes that require fewer pesticides, have a better taste and are adapted to North American greenhouse 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-specific, 1890 Research

***Project 3**: 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.

a) **Results**: Four diets were formulated to contain a total of 38% crude protein of which 0% was from the anaerobic digester protein (ADP) from poultry wastes in diet 1 (ADP-0), with casein and amino acid mix supplying all the protein in ADP-0, 10% in diet 2 (ADP-10), 20% in diet 3 (ADP-20), and 40% in diet 4 (ADP-40). Triplicate groups of twenty-five bluegill fish were fed one of the four diets to satiation. Results indicate that it is possible to substitute up to 20% of dietary protein in the semi-purified diets with the recovered protein from the poultry waste, without a deleterious effect. These experiments are currently being repeated using Rainbow Trout.
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.
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 appears to confirm this observation.
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*: Bluegill Production (Diet Effects on Growth)*

Description: WVSC Land-Grant Research and WVU Animal & Veterinary Science are collaborating to optimize strains and diets for production of hybrid bluegill. The objective of this program is to determine the differences in efficiency of nitrogen and lysine retention in to different strains fed different, commercially available diets.

a) **Results:** In summary, after consuming experimental diets for 12 weeks in aquaria conditions, Georgia Giant strain (GG) had an overall growth rate four times faster than the commercial hybrid bluegill strain (CHBG). Despite rapid growth and increased feed consumption, GG also achieved a more optimal feed conversion than CHBG. Although drastic differences in growth and feed efficiency were seen, both hybrid bluegill strains performed best on the diet formulated to 42% protein and 16% fat.
b) **Successes Resulting in Change** (Outcomes): Data showed that commercial feed containing 42% protein and 16% fat is ideal for both strains of hybrid bluegill and that Georgia Giant strain matures faster than CHBG.

c) **Stakeholder Benefits** (Impacts): Based on the results, some farmers have already changed the type of diet used in growing bluegill in fee-fishing operation. Because of the faster rate of growth of GG, some farmers are using this strain in fish-fishing operation.
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 agricultural 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 U.S. 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. Potential areas of alternative production include organic farming, ornamental and herb production, and hydroponic plant production.

a) **Results**: This project is currently under development. Results of the alternative crop marketing research will help current growers identify and develop direct marketing strategies for their produce and provide information for farmers interested in starting an alternative crop enterprise. Results of the economic analysis study will provide growers with information regarding the feasibility, profitability and return on investment of different production practices, such as greenhouse vs. outdoor or high tunnel and conventional vs. hydroponics. Six research experiments were completed in 2003 using the hydroponic production systems. Two presentations were accepted (an oral and a poster) at ISHS Protected Culture in Mild Winter Climates Symposium. Two manuscripts have been submitted for publication in the proceedings of ISHS Protected Culture in Mild Winter Climates Symposium. One abstract accepted for presentation at the 2004 ASHS annual meetings in July 2004. One abstract accepted for poster at 2004 Anaerobic Digester meeting in August 2004.
b) **Successes Resulting in Change** (Outcomes): This work is not sufficiently mature to show extension or outreach outcomes. However, public presentation

of this research and establishment of outside collaborations efforts has made Institutional endeavors better known to scientific community.

c) **Stakeholder Benefits** (Impacts): We have acquired new systems of intensive crop production to West Virginia. Our initial research shows promise in the use of this technology to increase production and diversity for WV growers.

d) **Assessment of Accomplishments**: The projects are 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 and Extension

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

Executive Summary:

(A) A multi-state integrated 1890/1862 extension and research project was established by WVSC and Virginia Tech staff. The goals of this work are to identify production practices on dairy operations and develop alternatives that improve food safety. Two research projects were developed to answer fundamental questions associated with a safe and secure food and fiber supply. WVSC organic chemists are developing synthesis routes for natural compounds including pyoluteorin - an antifungal agent. This antibiotic is particularly effective against pathogens of cotton. Upon maturity this project should identify more efficient routes to the synthesis of a family of antibiotics and semi synthetic compounds that are effective in controlling cottonseed pathogens. Microbiologists at WVSC are developing methodologies to monitor and reduce the presence of microbes in process waters and food products. The proposed approaches used physio-chemical means and bioluminescence for detection of microbial removal. More effective protocols are being developed to permit greater speed, sensitivity and selectivity for the detection of microbes in milk and orange juice. Also new technologies are being applied to the detection of specific coliforms in drinking waters.

(B) These three projects are not sufficiently mature to show change or benefit to stakeholders within WV.

(C) These three projects are not sufficiently mature to document benefits to clientele and stakeholders.

(D) Safe Quality Food Practices project was extended to allow completion of the proposed work. The two projects under Program 2.1 Plant and Animal Pathology were discontinued in September, 2003.

(E) Resource Allocation:

Total Invested - $172,730
SY - .50

Program 2.1: Plant and Animal Pathology

***Project 1**: Development of Crop Anti-Fungal Agents.*

Description: WVSC organic chemists are developing synthesis routes for natural compounds including pyoluteorin - an antifungal agent. This antibiotic is particularly effective against pathogens of cotton. A useful preparation of this compound will allow more extensive testing against a wider range of pathogens and this may reveal an even more impressive array of biological activities and novel crop uses. In addition, analogs of pyoluteorin may be more effective protective agents. Collaborators at the USDA Horticulture Crops Research Laboratory in Corvallis, OR and in Europe are interested in doing the extensive testing necessary to give us potential leads for effective analogs of pyoluteorin that should be synthesized.

a) Research Results: The three years of work funded for this project provided a better understanding of the chemistry and problems of preparing a compound. A simple analog, 2-benzoylpyrrole, was made and fully characterized. Additional analogs were prepared, however the primary goal for the synthesis for pyoluteorin was never achieved.

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

c) Benefits to clients and stakeholders (Impacts): This work is not sufficiently mature to show an impact.

d) Assessment of accomplishments: The project stalled and was discontinued in September, 2003.

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

***Project 2**: Improved Detection of Microbes in Food Products*

Description: Producers, processors, and consumers of food products in the United States have become increasingly aware of food safety issues over the past decade. Millions of food related illnesses attributable to microbial contamination are documented every year. Food may be contaminated during production, processing, storage or preparation. We are developing new applications for bioluminescence-based technologies that will permit greater speed, sensitivity and selectivity in the detection of microbial contaminants, such as *E. coli* and *Salmonella*.

a) Results: The overall goal of this research is to develop a rapid method to specifically detect pathogens or indicator organisms in liquid products by coupling bioluminescence detection to bacteria-specific antibodies. A protocol was developed for using the Bioprobe to detect bacteria in milk. The milk protocol was found to be ineffective for orange juice. Further experiments with the novel detection system (Pallcheck™) to rapidly assess the presence of microbe or specific pathogens were unsuccessful.

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

c) Benefits to clients and stakeholders (Impacts): This work is not sufficiently mature to show an impact.

d) Assessment of accomplishments: The project stalled and was discontinued in September, 2003.

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

Scope: State Research

Program 2.2: 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 College and Virginia Tech. A WVSC 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 WVSC scientist is primarily responsible for providing auxiliary services to food scientists at Virginia Tech. The survey instrument has been distributed and analysis of the date is in progress. A final report is anticipated soon. Therefore, the work is not sufficiently mature to show results.

b) **Successes Resulting in Change** (Outcomes): This work is not sufficiently mature to show an outcome.

c) **Stakeholder Benefits** (Impacts): This work is not sufficiently mature to show an impact.

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

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. Positive correlations between poverty and inadequate nutrition raise concerns for the health of the state's children and families. The Center on Hunger and Poverty report that 175,000 individuals in West Virginia were food insecure on average in 1996-1998, meaning they were hungry or at risk of hunger. Many of these individuals are children. Proper nutrition is crucial for sound health and normal development. Inadequate food energy intake can cause problems with attention, concentration, learning and other essential daily activities. Seniors who experience hunger are at risk for serious health problems such as a higher risk of stroke and increasing the incidence of depression as well as possibly limiting the efficacy of many prescription drugs. Surveys to evaluate existing nutrition education programs and assess current perceptions of nutrition in West Virginia are under development; in partnership with West Virginia University Extension Service. Nutrition education programs are being designed with a built-in means to assess their effectiveness. In the future new models for nutrition education will be delivered, evaluated for effectiveness and ranked for further development.

(A) The project is not sufficiently mature to show change within WV.
(B) The project is not sufficiently mature to document benefits to clientele and stakeholders.
(C) The human Health and Nutrition project is progressing will be continued.
(D) Resource Allocation:
Total Invested - $77,499
SY - 0.45

Program 3.1: Human Health & Nutrition

Project 1*: Nutrition Education in West Virginia*

Description: The perception of nutrition related issues have an impact on the delivery and utilization of nutrition education programs. For instance, if a legislator holds the perception that hunger is not an issue in West Virginia he/she is unlikely to propose policy that will increase availability of food. In the same way, a single mother may perceive her malnourished child to be "small for his age" and not seek assistance in securing proper nutrition. These perceptions must be identified in order to develop appropriate nutrition education programs to meet the needs of our community and state. It is also imperative to look at existing programs in the state and across the nation to determine what is successful and what can be expanded or replicated in West Virginia. For instance, community gardens often provide a food source to a local area, but it hasn't been determined that availability of vegetables actually impacts the nutritional diets of those living in that community.

a) **Results**: Surveys to evaluate existing nutrition education programs and assess current perceptions of nutrition in West Virginia are under development; in partnership with West Virginia University Extension Service. Nutrition education programs are being designed with a built-in means to assess their effectiveness. 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): This work is not sufficiently mature to show outcomes beyond research results.
c) **Stakeholder Benefits** (Impacts): This work is not sufficiently mature to show an impact.
d) **Assessment of Accomplishments**: The work is progressing and should be continued.
e) **Source of Expenditures & Impact Scope**:
Funding Source- Evans-Allen (Section 1445)
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 very important to the state's economy. Research efforts underway at WVSC 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 in to 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 are not sufficiently mature to show change within WV.
(B) These 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- $ 991,178
SY- 8.88

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. 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 monometallic starting materials. Although in its infancy, this research has already received recognition by earning a certificate for scientific achievement at a state research festival.
b) **Successes Resulting in Change** (Outcomes): This work is not sufficiently mature to show outcomes beyond research results.
c) **Stakeholder Benefits** (Impacts): Public presentation of this research and establishment of outside collaborations efforts has made Institutional endeavors better known to scientific community.
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 phosphine ligands that are supported by an insoluble inorganic support, e.g., alumina or silica. The major advantages sought here include, the use of high concentrations of ligands thus the greater capacity for metal complexation, and the ease of removal of the supported ligand-metal complex from the water.

a) **Results:** Still in its infancy, this research is already showing the possible silver(I) mediated synthesis of a diphosphine oxide. Preliminary NMR results point to possible diphosphine oxide product. Reduction of a diphosphine followed by reaction with formaldehyde yields a water-soluble phosphine.
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

***Project 3**:* Detection of Toxins in Soil and Groundwater Supplies

Description: The specificity of metal-binding compounds is often high enough to allow quantification of specific metals found in complex mixtures such as soils. The goal of this work is to make and characterize metal-binding compounds that can be used to indicate/report when they have adsorbed a specific metal. Thus assays could be developed to measure various metals from complex soil mixtures. The metal binding compound diaminonaphtalimide (ED-4) is one compound being studied because of its high specificity for copper. The evaluation of ED-4 will lead to compounds and procedures to evaluate heavy metals in industrial sites and brown fields.

a) **Results:** The parent compound and analog were developed, but not tested for determination of copper utilizing a characterized WV soil. Other analogs of the parent compound were designed and their respective routes of synthesis have been planned.
b) **Successes Resulting in Change** (Outcomes): This work is not sufficiently mature to show outcomes beyond research results.
c) **Benefits to clients and stakeholders (Impacts**): This work is not sufficiently mature to show an impact.
d) **Assessment of accomplishments**: The project stalled and was discontinued in September, 2003.
e) **Source of Expenditures & Impact Scope:**
Funding Source- Evans-Allen (Section 1445)
Scope of Impact- State-specific, 1890 Research

***Project 4**:* Novel Methods for Heavy Metal Removal in Mine Drainage

Description: Soil and water near areas with mining, industry, and agriculture are susceptible to contamination due to acid mine drainage, release of industrial wastewater, and pesticide use. Metals such as copper and aluminum, as well as some pesticides not only threaten plants and animals in streams and rivers, but also threaten the productivity of soils. This research will evaluate metals in streams impacted by acid mine drainage and novel methods for remediation.

a) **Results:** A pumice based polymer was investigated as a remediation tool for acid mine drainage. This molecular weight polymer was extremely viscous and difficult to mix with pumice. A polymer of much lower viscosity was secured and the application improved considerably. Unfortunately, the lower molecular weight polymer was basic and caused precipitation rather than being exchanged on the resin support. A second phase was the detection of metal contamination at Heizer Creek in Poca, WV. The site was to be sampled over a ten-week time period with analyses of water, soil, and plant material. Plans were to test the polymer's ability to remediate this contaminated site.

b) **Successes Resulting in Change** (Outcomes): This work is not sufficiently mature to show outcomes beyond research results.
c) **Benefits to clients and stakeholders (Impacts**): This work is not sufficiently mature to show an impact.
d) **Assessment of accomplishments**: The project stalled and was discontinued in September, 2003.
e) **Source of Expenditures & Impact Scope:**
Funding Source- Evans-Allen (Section 1445)
Scope of Impact- State-specific, 1890 Research

***Project 5**:* Determining the sorption mechanism of atrazine and 2,4-D on soil and humin

Description: Over application of pesticides can cause toxins to run-off into streams or leach into groundwater. Pesticides such as 2,4-D and atrazine not only threaten plants and animals in the streams and rivers, but also threaten the productivity of soils. Better estimates of the amounts of these chemicals are needed. Also a clearer understanding of the way pesticides react with soil components will facilitate more effective land management plans. This project will evaluate the interaction of 2,4-D and atrazine with the soils.

a) **Results:** The project utilized two soils that were treated with 2,4-D and atrazine. Analyses were done to evaluate how the pesticide reacted with the soil components.
b) **Successes Resulting in Change** (Outcomes): This work is not sufficiently mature to show outcomes beyond research results.
c) **Benefits to clients and stakeholders (Impacts**): This work is not sufficiently mature to show an impact.
d) **Assessment of accomplishments**: The project stalled and was discontinued in September, 2003.
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: The "Bioplex" program at West Virginia State College (WVSC) comprises five research projects involving the utilization of agricultural waste and thermophilic anaerobic digestion: (***1***) The incorporation of thermophilic, anaerobic digestion as an integral part of farm waste treatment associated with the farming industry; (***2***) Pathogen reduction with waste treatment systems and thermophilic anaerobic digestion has as an alternative for complying with public health requirements; (***3***) The feasibility of using

microbial protein from anaerobically digested poultry litter as a substitute for fishmeal in trout feeds; (***4***) The relationship between the biochemical control parameters and the resident microbial populations (the link between microbial community structure and bioreactor function); and (***5***) The organic materials or byproducts resulting from thermophilic anaerobic as a value source of fertilizers.

a) **Results**: 1) Evaluation of pilot thermophilic anaerobic digester operation. Experiments compared the effect of feed loading rates and temperature on biogas production. Results showed that loading rates had no effect on the feed to biomass ratio while biogas production dropped with a decline in temperature. 2) Loss of viability of pathogens in digested livestock residuals. Experiments characterized the viability of *Giardia muris* and *Ascaris suum* in 1L digesters. Results showed no *Giardia* DNA detection, suggesting total destruction. *Ascaris suum* eggs were rendered inviable after 24hr retention at 55C, while 5-day retention at mesophilic temperatures showed 100% viability. 3) Formulating aquaculture feed from digested poultry litter. 50Kg of digester microbial protein was purified and characterized for nutritional value. Experimental feed rations have been formulated and a 90-day rainbow trout feed trial initiated. 4) Microbial communities structure and function in thermophilic anaerobic digesters. Analysis of 16S rDNA libraries of Bacteria and Archaea has revealed diverse bacterial communities and shown the need for extensive sampling and experimental repetition. 5) Digested solids are an effective soil amendment for phosphorus. Digested liquids show promise as alternative fertilizers for hydroponic lettuce and tomatoes.
b) **Successes Resulting in Change** (Outcomes): A local greenhouse producer and engineer are currently interested in using our technology and findings to design a greenhouse-digester integrated system that uses hydroponics and aquaculture. This project is in the first phase of marketing feasibility. Two 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 and national meetings to attract stakeholders from several states including 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.
d) **Assessment of Accomplishments**: The WVSC 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

Program 4.3: Forest Management and Ecosystem Preservation

***Project 1**:* Predicting Effects of *Ailanthus altissima* Invasion on West Virginia Hardwood Forests

Description: *Ailanthus altissima* (Tree-of-Heaven) is an early-successional Asiatic tree that has invaded 46 of the lower 48 states, reaching greatest abundance in urban areas and along major roadways. This tree species spreads through wind dispersed seed and is tolerant of a wide range of soil conditions. It forms dense clonal stands and previous research has revealed the production of an allelopathic compound. The purpose of this research is to investigate the extent of *A. altissima* invasion into a West Virginia forest. Study includes effects of root exudates on germination, growth, and formation of root nodules in native and other invasive species; and, subsequently, nutrient dynamics and forest succession.

a) **Results:** A series of experiments were conducted to develop laboratory methods appropriate for replicating interactions between *A. altissima* and establishment stages of neighboring plants in the wild. Differential effects of aqueous leaf extracts and root exudates were observed among the seven commercial species used. Each treatment affected radicle growth in one or more of the test species. In contrast, no treatment affected rates of germination. These observations corroborate previous reports that *A. altissima* produces one or more water-soluble compounds that are degraded by microbial activity and lend credence to the hypothesis that they can affect neighboring vegetation in nature.
b) **Successes Resulting in Change** (Outcomes): Media exposure to this project has triggered interest in invasive organisms throughout the state and the nation; providing opportunities for WVSC to begin establishing itself in the area of ecological research.
c) **Stakeholder Benefits** (Impacts): This work is not sufficiently mature to show an impact. Information generated from this research will assist forest managers rank the threat of *A. altissima* relative to other invasive species and to identify microhabitats in which native species are most vulnerable. This project is not sufficiently mature to document benefits to clientele and stakeholders.
d) **Assessment of Accomplishments**: The project thought making project was discontinued in July, 2003 when the principal investigator left WVSC.
e) **Source of Expenditures & Impact Scope:**
Funding Source- Evans-Allen (Section 1445)
Scope of Impact- State-specific, 1890 Research

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

Note: Executive Summary described in the Cooperative Extension Section

Total Invested- $193,082
SY- .5

Program 5.1: Regional Economic Forecasting

***Project 1**: Community Asset Mapping Research*

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

SECTION III. 1890 COOPERATIVE EXTENSION PROGRAMS

Table 2 1890 Cooperative Extension Programs: Summary of Resource Allocation by Goal and Program

ANNUAL ALLOCATION OF RESOURCES *(FY 2003)*							
NATIONAL GOAL / PROJECT		**FUNDING SOURCE**					
Goal	***Program Description***	***Federal Formula***	***Federal Other***	***State Match ****	***State Other***	***Other***	***TOTAL***
GOAL I							
Program 1.1	Alternative Agriculture Extension and Education	102,711	0	18,176	0	10,000	*130,887*
Program 1.2	The Expansion of Horticultural and Forestry Activities in West Virginia	97,781	10,000	12,203	0	0	*119,983*
	Total	**200,492**	**10,000**	**30,378**	**0**	**10,000**	***250,871***
GOAL II							
Program 2.1	Food Safety and Allergy Awareness	77,781	0	12,203	0	0	*89,983*
	Total	**77,781**	**0**	**12,203**	**0**	**0**	***89,983***
GOAL III							
Program 3.1	Nutrition Education and Wellness System	136,983	13,633	19,403	0	0	*170,018*
	Total	**136,983**	**13,633**	**19,403**	**0**	**0**	***170,018***
GOAL IV							
Program 4.1	Biotechnology and Environmental Science Outreach	57,781	0	12,203	0	0	*69,983*
	Total	**57,781**	**0**	**12,203**	**0**	**0**	***69,983***
GOAL V							
Program 5.1	Youth Development	215,599	142,944	50,900	5,000	20,000	*434,443*
Program 5.2	Family and Community Education	141,330	0	19,403	0	0	*160,733*
Program 5.3	Community And Economic Development	191,365	0	25,056	61,386	24,000	*301,807*
	Total	**548,294**	**142,944**	**95,359**	**66,386**	**44,000**	***896,983***
	GRAND TOTAL	***$ 1,021,330***	***$ 166,577***	***$ 169,545***	***$ 66,386***	***$ 54,000***	***$ 1,477,838***

***** ***State match appropriations allocated between July 1 and September 31, 2003***

WVSC 1890 Cooperative Extension Overview

Extension and outreach programs are currently offered to 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 sources of funding are secured, opportunities for the institution to expand its extension and outreach programs to other communities exist. The following section presents a description of all the activities and the impacts they had on the

communities and stakeholders we served in FY 2002. Table 2 summarizes the funding invested in each goal and program of the institutions' plan of work for fiscal year 2003.

Goal 1: An agricultural system that is highly competitive in the global economy …

Executive Summary:

West Virginia has the percentage of family operated farms in the country. Individuals and their families operate 95.3% 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. For the first time, starting July 2003, West Virginia State College 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.

Resources Allocated: $250,871
FTE-1.25

Key Theme: Residential Agriculture

Program 1.1*: Alternative Agriculture Extension and Education*

a) **Description**: The West Virginia Agriculture Statistics Service (WVASS) recently revealed that West Virginia is the number one state in the country in percentage of family farms, followed by Tennessee, Alabama, Oklahoma and South Carolina. Individuals or families run 95.3 percent of the Mountain State's farms. To be sure to being addressing the needs of this constituency, West Virginia State College has partnered with the citizens of Roane County to place a full-time Extension Agent for Agricultural and Natural Resource. Roane County is located in central West Virginia with a population of approximately 15,000. Roane County is sparsely populated with a population density of only 39 people per square and 15 housing units in the same area. Small, part-time operations dominate the agricultural production in the county.

b) **Outputs:** A Calf Pool was organized through the assistance of the Extension Agent to increase genetic diversity within Roane County's cattle herds. Additionally, a bio-terrorism seminar was held to inform local citizens of threats of bio-terrorism as it relates to animal disease and the food chain. There were 95 Roane County residents in attendance to learn of the seminar.

c) **Outcomes:** Eliminating animals with inferior genetics and replacing them with a higher quality breeding stock increased the capacity of Roane County's cattle producers. This increase will promote rate of gain, breeding structure, muscle

definition, and help the farmers to receive a higher dollar value for their animals the following year

d) Impact: The Roane County Calf Pool marketed 204 cattle at above average market prices and produced $110,003.29 in revenue for producers in the local economy. From the bio-terrorism presentation, a county-wide system of notification was put in place to quickly help local agriculture interests recognize and respond to bio-safety issues.

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*

Description: Residential horticulture and pest management issues continue to be one of the most recognizable access points for the community in regards to cooperative extension services. From questions as simple as handling residential lady bug infestations to more complicated natural invasive 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.

Urban forestry is a specialized branch of forestry, which covers planning, designing, establishing, improving, 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 West Virginia Department of Forestry, WVU 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 for these citizens is dependent upon the urban environment. Healthy, safe, and effective trees enhance this 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, professionals, municipalities and agencies.

a) Outputs: The Extension Agent visited more than twenty Roane County residents' homes for observations, interpretations, diagnostics, and explanations on plant diseases, insect problems, irregular plant growth, livestock health, The Extension Agent averaged 28 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 article every other week.

In addition, coordinated development of WVSC urban forestry extension programs with existing programs run by the WV Division of Forestry Urban Forestry staff and WVU Department of Forestry Extension staff. Supported publication of a booklet for the urban community on tree selection and site preparation developed by WV Division of Forestry Urban Forestry Technical Specialist. Purchased of 75 trees for West Virginia Arbor Day celebrations with a tree planted in each county and "Tree City". Pruning workshop by WV Division of Forestry Urban Forestry Technical Specialist at WVSC for 12 individuals

b) Outcomes: The group and one-to-one interactions allowed West Virginia State College to become a trusted source of agriculture and natural resource information in the county. As this position represents the institution's first county placement in this area and an expansion of the overall service area, it is vitally important for the agent to continue building the respect of the community for West Virginia State College agricultural initiatives.

c) Impacts: We have increased the visibility of the new Urban Forestry Extension Program at WVSC by coordinating with other forestry programs in the state, funding Arbor Day tree plantings, development of a urban forestry planting booklet and training of professionals in the proper pruning techniques.

d) 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:

It is estimated that up to 10% of children suffer from serious food allergies in the state of West Virginia. Up to 5% of the U.S. total population continues to have severe allergic reaction to food even into adulthood. Additionally, professionals in the food preparation industry are only just beginning to understand the consequences of cross-contamination of food products. In West Virginia, awareness of both is extremely limited due to the state's rural nature.

Total Invested - $89,983
FTE - .10

Program 2.1: *Food Safety and Allergy Awareness*

(a) Description: An educational brochure about food allergy awareness was piloted to increase the awareness of allergens among parents, health care providers, school nurses and education providers and to prevent anaphylactic reactions among patients. Furthermore, in an effort to provide education on foodborne

illness and prevention, educational sessions were provided for staff in after school programs. These sessions focused on proper food handling techniques, hand washing and temperature control. In addition, staff were trained to present basic food safety activities to the after school children.

(b) **Outputs:** Approximately fifty area physicians received a copy of the food allergy awareness brochure and reviewed it for accuracy. In addition, nine after school staff participated in two foodborne illness prevention trainings, and provided five food safety activities for limited resource children (5-12 years of age). An average of fifty children participated in the activities.

(c) **Outcomes:** The response rate of area physicians was insufficient to justify pursuit of the pilot program, while no children in the after school programs reported foodborne illness during the reporting period.

(d) **Impact:** Food safety training for after school staff helped to prevent foodborne illness in children, a high-risk population, on a daily basis.

(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:

In addition to providing essential nutrients for growth and development, foods can supply substances that either contribute to or protect against chronic disease. Chronic diseases, such as cancer, osteoporosis, diabetes, hypertension, heart disease and obesity can be profoundly affected by diet. In 2003, West Virginia consistently ranked worse than the nation with regard to chronic disease. According to "America's Health: State Health Rankings," released by the United Health Foundation, the American Public Health Association and the Partnership for Prevention, West Virginia had the worst total mortality rate among states in 2003, 2002, and 1990. The state ranked 49th for cancer deaths in 2003 and 48th for heart disease-related deaths. Improved nutrition practices are an important aspect of health promotion, in conjunction with adequate physical activity; management of blood cholesterol, blood sugar levels, and blood pressure; cessation of tobacco use and moderation in the use of alcohol.

Total Invested – $170,018
FTE – 0.9

Program 3.1: *Nutrition Education and Wellness System*

(a) **Description:** In order to increase West Virginian's awareness of good nutrition and commitment to healthy lifestyles, many programs were developed and implemented. Such programs focused upon the importance of physical activity, obesity prevention, nutrition education, cardiac health, and patient-physician communications.

The ONHE Specialist contributed to the development of the CARDIAC Fun! curriculum published by WVU Cooperative Extension. The program focuses on improved diet and increased physical activity through fun, family-oriented programs. Educating adults in the area of nutrition and health was also a focus. Programs were developed and provided on various topics, including fad diets, cholesterol lowering through diet and good nutrition. In addition, the Kanawha Coalition for Community Health's Obesity Work Group is comprised of members of the community who have an interest in reducing obesity in our county. The group developed "Healthy At Any Size," a presentation that encourages participants to forgo dieting and, instead, focus on their health. Finally, the ONHE collaborated with the West Virginia State College Department of Sociology on a research project to determine patient satisfaction of their communication experiences with their physician.

(b) **Outputs:** Throughout the state, 147 adults and children participated in the CARDIAC Fun! program. Of the 147 participants, 61 were adults. The Summer Food Service Program, provided 15,136 school-age children with nutritious, free lunches during the summer months. 21 nutrition presentations on various topics, including fad diets and cholesterol lowering were given to a total of 554 people. The Office sponsored two nationally broadcast teleconferences for 21 registered dietitians who received a total of 4 hours of continuing education credits each. In addition, the Kanawha Coalition for Community Health's Obesity Work Group developed "Healthy At Any Size," a presentation that encourages participants to forgo dieting and, instead, focus on their health. Finally, the ONHE, with the West Virginia State College Department of Sociology developed a survey tool in an upper level Sociology class and administered it to 118 people who had just seen a physician in a local outpatient clinic.

(c) **Outcomes:** All "CARDIAC Fun!" participants documented increased physical activity through the use of step counters and increased intake of fruits and vegetables. With respect to ONHE presentations all participants responded that they were satisfied with them. The "Healthy at Any Size" program has been offered throughout the county at worksites, free health clinics and schools. The pre and posttests used to determine attitude change and knowledge acquisition have reflected a 17% attitude change regarding dieting practices and healthy behaviors. Finally, of the 118 patients that were surveyed about their communication experience with their doctor following an outpatient visit, 87% were satisfied with their treatment, but admitted that they sometimes have

difficulty communicating with their physician. From the surveys, a project has been initiated to help empower elderly patients to request better explanations from their physicians about their treatment. The project is expected to be completed in FFY 2004.

(d) **Impact:** Nutrition and health education programs ranging from obesity prevention to wellness initiatives were directly provided to approximately 1300 individuals. In addition, over 15,000 nutritious meals were provided to area youth during the summer months.

(e) **Funding Source:** Smith-Lever 1444, State of West Virginia, Food Stamp Nutrition Education Program
Scope of Impact: State Specific (Other Nutrition Education and Summer Food Service Program) 1890/1862 Collaboration

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

SEE RESEARCH Program 1.2 FOR INTEGRATED EXTENSION PROJECTS

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 economically vulnerable due to a lack of education, skills, or training. Many adult West Virginia residents presently lack the education and/or skill level 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 with 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 set or allow them to view their skills from a new perspective is vital

to position West Virginia's economy for the 21st century. The youth of these communities often have negative views of their current situation and very limited vision of future career prospects.

Total Invested: $896,983
FTE – 13.12

***Program 5.1**: Youth Development*

Children Youth and Families at Risk (CYFAR)

(a) **Description**: WVSC partners with West Virginia University through the Children, Youth, and Families At Risk (CYFAR) Grant Initiative. WVSC is operating a CYFAR site, known as the Harambee Learning Center, as part of a statewide literacy and capacity-building program. This program also participated in a statewide initiative designed to increase the use of technology. In addition, another partnership was formed with West Virginia University through the delivery of a summer reading enrichment program called Energy Express. Throughout, the youth are exposed to many skill-related reading activities such as site word recognition; read-a-loud; and vocabulary building through the use of a Word Wall.

(b) **Outputs:** The WVSC CYFAR site serves an average of 50 students per day, while providing after-school tutoring, homework assistance and reading enrichment. All youth at the site are provided with books and are required to read and write daily.

(c) **Outcomes:** Sixth- and ninth-grade students were given a practice standardized test (SAT-9) in the spring. Results showed a 9% increase in reading scores for sixth-grade students from the fall practice test and an increase of 13% for ninth-grade students. In addition to reading enrichment, youth participants at Harambee were given opportunities to work on computer-related activities in order to assist them in feeling more comfortable in working with computers. Results from a pre-/post-survey indicated an increase in the comfort level in working with computers for every participant.

(d) **Impact**: The provision of reading enrichment opportunities enabled program participants to increase their knowledge of and ability to read, demonstrating that crucial literacy skills were enhanced.

(e) **Funding Source-** WVU/CYFAR Sub-contract, Smith-Lever (Section 1444)
Scope of Impact- State-specific

4-H/Youth Development

(a) **Description** WVSC offers diverse youth-oriented programs geared toward giving young people opportunities to develop skills that will assist them in personal development, skill development, educational attainment, and career choices.

WVSC 4-H youth benefit from in-school programs, traditional 4-H activities, camping programs, and after-school experiences. Examples include: the Teen Leadership Connection (TLC) program, which involves urban youth and teaches life skills such as diversity, conflict resolution, social skills and leadership development; 4-H in Clay County provides a traditional, year-round 4-H program designed to promote personal development, communication skills, access to caring adults, and opportunities to learn new skills; the Fifth Annual Summer Transportation Institute, which is a four-week residential program offered to 8th and 9th graders focusing upon careers available in the transportation industry; the Health, Science, and Technology Academy (HSTA) program, a summer camp that exposes youth to forensic science and leadership development opportunities; and K-6 after-school programs that focus upon the provision of academic enrichment activities in a safe and nurturing environment for youth in public housing.

(b) **Outputs:** The Character Counts Curriculum, which provides a practical means of character development while accommodating a variety of lifestyles and belief systems, was presented to 117 students in TLC after-school programs. Nearly 375 members of the Clay County 4-H program have had opportunities to participate in several meaningful 4-H experiences. Among those experiences are: 4-H project work; mentoring; shooting sports; and 4-H camp. In addition, approximately forty 4-H members learned new methods to produce agricultural commodities through preparing for and participating in a youth agricultural fair. The Summer Transportation Institute served eighteen youth this year in 8th and 9th grades. During the four-week camping period, campers participated in thirty-six educational sessions, which included instruction in math and science; exploring transportation fields; and preparation for the ACT college entry exam. The Health, Science, and Technology Academy provided an in-service to five practicing teachers, who in turn instructed approximately 73 participants in the forensic science disciplines, such as biology, anatomy, and biochemistry. On average, approximately forty students per day participate in our After-School Program. They are engaged in tutoring; homework assistance; social enrichment; computer enrichment; drug prevention and elimination; nutrition and wellness activities; and character development. Nearly ten parents have also served as intermittent volunteers throughout.

(c) **Outcomes:** Participants of the Teen Leadership Connection 4-H groups gained knowledge of life skills, team building, bicycle safety, and skateboard safety. Participants' teachers reported positive changes to students' interpersonal behavior, and school and class attendance. Teachers also reported increased participation in community service activities. Parents reported an improvement in the students' behavior at home during the TLC program. Nearly 25% of the 4-H aged children are living in poverty. Of the total population of Clay County youth ages 5-18, the 4-H program served approximately 20% of them. Through field trips, guest speakers, and class projects, 100% of STI participants reported an increase in their knowledge of careers in transportation related fields. In addition,

85% of participating students reported that HSTA had a moderate to very high impact on increasing their interest in health care careers, 95.24% reported a moderate to very high increased knowledge of forensic science, and 100% reported being satisfied with their HSTA experience. Qualitative inquiries with teachers of after school program students yielded overall academic improvements in content matter, conjoined with improvements in behavior during school hours.

(d) **Impact**: WVSC youth programs have served nearly 1000 youth throughout the service area, and have assisted in the improvement of participants' academic achievement, literacy, behavioral development, and leadership skills.

(e) **Funding Source**: Smith-Lever (Section 1444), City of Charleston, Charleston Housing, US Department of Transportation-Federal Highway Administration, Subcontract WVU/Health Science Technology Academy Grant

Scope of Impact: State-specific

Program 5.2 *: Family Education*

Parenting Education

(a) **Description:** The Office of 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 and effort 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. Classes are also offered that address various parenting topics for teens and parents.

(b) **Outputs:** Approximately 525 youth and adults have participated in various programs, including Baby Think It Over, which addressed parenting topics and pregnancy prevention.

(c) **Outcomes:** Pre-and post-test data indicate 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 has had on their views of teenage parenthood. A 16 year-old male stated "I knew parents had a lot of responsibilities, but I didn't know they had that many." One 16 year-old female student stated, "I realize how little patience I have. I also see how life will NEVER be the same again." Parents also agree that this program is beneficial. When asked, "What do you think your son/daughter learned from this experience," parents responded, "how much care

it takes for a baby to be content," and "that caring for an infant/child is a 24 hour a day responsibility."

(d) **Impact:** The Baby Think It Over programs have resulted in an increase in participant knowledge of the skills required to raise a child. 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:** Federal Formula Funds; State Matched Formula Funds
Scope of Impact: State Specific

Transitional Living Education

(a) **Description:** WVSC built two facilities on campus to provide in-residence assistance to two growing populations that are often neglected academically. One program (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 transition into dormitory life. This facility can house six students and two program assistants. A Case Manager also serves as part of the staff. The second 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 Case Manager also assists these program participants. Participants in both programs are also taught needed independent life skills.

(b) **Outputs:** Residents participated in 71 independent life skills lessons to help prepare them for transition into the dormitories and other aspects of independent living. A total of 9477 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 115 hours of one on one time with the Case Manager per month.

(c) **Outcomes:** 50% of students received a 2.0 GPA or higher, and 33.3% of both HOUSE and Phase II students continue to take classes on the campus, working towards their degree.

(d) **Impact:** Both the HOUSE and Phase II program provide both needed and tailored case management services to clients in a residential setting. Initial program outcomes indicate success of this pilot initiative. In addition, referral agencies, residents, social service providers, and youth in foster care continue to be an active part of this program and its ongoing development.

(e) **Funding Source:** Federal Formula Funds: State Matched Formula Funds
Scope of Impact: National

Technology and Literacy Education Programs

(a) Description: Charleston Housing and West Virginia State College Division of Agricultural, Consumer, Environmental, and Outreach Programs (ACEOP) have partnered to establish ten new Neighborhood Network Centers in CH's family and senior living complexes. These centers provide technology training and educational programs to children, youth, families and seniors that reside in all ten public housing developments. Currently, Charleston Housing maintains 1336 apartments with 1955 residents which includes the following Charleston area sites: South Park Village, Carroll Terrace, Lippert Terrace, Lee Terrace, Jarrett Terrace, Littlepage Terrace, Oakhurst Village, Hillcrest Village, Washington Manor, and Orchard Manor. Additionally, four faith-based non-profits and one community based from the provided space for four additional literacy and technology centers. All but one of these sites was located in the Charleston metropolitan area. The other site was located in London, a rural area of Kanawha County.

(b) Output: Staff created Computer Information & Job Resource Handbooks for each site. These handbooks provide informative website directories that cover homework, health, job sites, and equipment directions. Residents were surveyed concerning their expectations and technological needs, as well as, convenient times for operation. Computers, scanners, printers, wiring, surge protectors, and routers were ordered for set up at each site with high-speed internet connections. WVSC staff delivered the Family Storyteller curriculum as part of its endeavors. Family Storyteller is an educational program, developed by West Virginia University Extension Service, using children's literature and is built upon the ideas of family literacy and parental empowerment. Furthermore, this program emphasizes and models carefully selected book-reading techniques, such as previewing the book, reading with expression, labeling, and asking questions. Sixteen families participated in and completed this six-week literacy course. WVSC also partnered with a small minority-owned business named CYBERKIDZ and the West Virginia State Community and Technical College to deliver more than 6 weeks of programming spread throughout the various sites. At one site, a volunteer instructor initiated a long-term class that extended for six months of his time to educate senior citizens concerning technology issues.

(c) Outcome: Stakeholders had the opportunity to designate where our labs would be, to look at wiring issues and have other input on program development to increase ownership of and commitment to the program.

(d) Impact: Community computer centers were created in 14 limited resource communities. These centers increased community access to technology and strengthened their capacity for growth. Limited resource youth and adults were trained to utilize computers and computer peripherals as a result they now have the capability of accessing the Internet to utilize it as an educational resource and communications device.

(e) Funding Source- Housing and Urban Development Grant, Higher Education Policy Commission Grant, Federal and State Allocations
Scope of Impact- State-specific

Workforce Education

(a) Description: Due to geographic limitations, high poverty rates, and low educational attainment, there is a lack of opportunity during summer months for limited resource youth from southern West Virginia to participate in extra-curricular activities. Without educational enhancement opportunities many of these youth would have only limited employment opportunities and never seek post-secondary education. Leadership development exercises were identified as a major need area as well as life skills education.

Also, 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: WVSC ACEOP partnered with Workforce Investment Region 1 to hold a pilot summer leadership camp, The Workforce Development Academy (WDA), for limited resource high-school students during the summer of 2003. Youth Educational Services (YES) offered through Workforce Investment Region 1 identified youth participating in this program as at-risk of dropping out of school.

The WECAN4U website

(c) Outcomes: Fifty-five limited resource youth from southern West Virginia participated in the six-day residential experience. Topics covered during the program included career awareness, leadership skills, teamwork, post-secondary education opportunities, resume development, and abstinence/safe sex education. For many of these youth it was their first opportunity to stay away from home and/or be exposed to an institution of higher education.

(d) Impact: A majority of youth surveyed at the end of camp expressed knowledge and attitude change regarding their potential involvement with post-secondary workforce training and exposure to different career options. More than 80% of participants also indicated that they had a positive experience and would be instituting some of the leadership lessons they learned upon returning home.

(e) Funding Source- Federal and State, Workforce Investment Region One Youth Services, Community Service Block Grant
Scope of Impact-- State Specific, Multi-State, National

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