2016 West Virginia University and West Virginia State University Combined Research and Extension Plan of Work

Status: Accepted

Date Accepted: 06/05/2015

I. Plan Overview

1. Brief Summary about Plan Of Work

This report represents the combined five-year plan of work for three entities: the West Virginia University WVU Agriculture and Forestry Experiment Station (WVU-AFES), West Virginia University Extension (WVUES), and the West Virginia State University (WVSU) Gus R. Douglass Land Grant Institute (GRDI) which includes both Research and Extension programs. In past years each institution submitted a separate plan of work. This report is our first effort at a combined plan of work. While we already have some coordinated research and extension programming we plan to meet twice a year in future years to increase our level of joint planning and cooperation. Our first step this year was to agree on ten program areas (listed below) that could encompass each institution's strategic goals. Our next step will be to increase coordination and reduce duplication of effort in each of the ten program areas.

The WVU-AFES supports approximately 41 FTE research faculty positions distributed across the 110 individual scientist positions. The Station also supports approximately 25 FTE technical positions, 35 clerical and farm/forest worker positions and 40 professional support positions (mostly graduate students). The Experiment Station operates seven farms and two forests which support faculty research. Four of the farms (Animal and Nutritional Sciences farms in Morgantown and Reedsville, Horticultural and Agronomy farms in Morgantown) and the University Forest are sufficiently close to the University campus to be used extensively to support academic programs in addition to research. Outlying farms include the Reymann Memorial Farm (beef, sheep, aquaculture, agronomic crops and bull testing station) and Kearneysville Tree Fruit Research Farm (primarily apples and peaches) in northeastern West Virginia; the Willow Bend Farm in the southeast (pasture raised and finished beef); and the Tygart Valley Forest (mostly oak regeneration and disease control research).

Four centers and one organizational unit exist within the College to help focus and direct our efforts on economic development, natural resources and the environment. They also contribute to our ability to leverage Hatch and McIntire-Stennis capacity funding by attracting external competitive grants and other external sources of funding. The four centers are the Natural Resource Analysis Center (NRAC), the Environmental Research Center (ERC), the National Geospatial Development Center (NGDC) and the Appalachian Hardwoods Center (AHC). The organizational unit is the West Virginia Cooperative Fish and Wildlife Unit..

The regular WVUES workforce of 465 county agents, state specialists, and staff is augmented by an additional 1,200 seasonal employees who help deliver our large, statewide summer learning programs. More than 18,000 well-trained volunteers also help design, deliver, evaluate, and improve Extension programs each year. Employees of numerous longtime program partners, such as Regional Education Service Agencies (RESA) of the West Virginia Department of Education, West Virginia Department of Agriculture, county school professionals, West Virginia Department of Health and Human Resources, and WVU Health Sciences, help in this regard as well. Many identify with WVU Extension through our educational programs. Some of the most recognized programs are 4-H, Dining with Diabetes, Extension Master Gardeners, Firefighter Training, Community Educational Outreach Service (CEOS), Family

Nutrition Program, Energy Express, Soil Testing, Workplace Safety, Pesticide Recertification Training, Character Education, Beef Quality Assurance, Farm Management, Forest Stewardship, and Community Leadership Development. The University's strategic plan specifically mentions the work and contribution of the Extension Service, "Expand outreach efforts to connect the campuses to citizens and communities throughout the state. Provide resources and information to equip WVUES county agents, and other personnel engaged in outreach and care, for a broader role as ambassadors for the institution."

WVUES continues to play a major role in reaching these goals and objectives by implementing relevant programs linked to the National Institute of Food and Agriculture's five priority areas childhood obesity, global food security and hunger, climate change, food safety, and sustainable energy. Programs also are implemented in youth development, workforce and community development, and family finance and relationships.

WVSU's Gus R. Douglass Land Grant Institute currently supports 36 FTE positions across research and extension. Research and extension efforts continue to expand and integrate programs. As the University builds infrastructure and capacity, and is able to secure additional funding sources, existing research and extension programs are further strengthened and new programming is being developed to better serve the needs of stakeholders.

Aligning WVSU research and extension programs within NIFA's priority areas has proven beneficial, by providing an opportunity to determine where programs complement each other; as well as, where there are opportunities to build greater collaboration and identify pathways for new integrated efforts. The Masters of Science in Biotechnology program, within the WVSU College of Natural Sciences and Mathematics, continues to benefit from the development and maturation of research programs. Split appointments of graduate research faculty within GRDI have permitted the increased participation of undergraduate and graduate students in agricultural and environmental research.

The West Virginia Agriculture and Forestry Experiment Station is part of the Davis College of Agriculture, Natural Resources and Design. While the West Virginia Cooperative Extension Service is a separate administrative unit and not part of the College, research and extension are integrated through joint appointments (nine of 110 faculty in the Davis College have partial extension appointments), through coordination of activities and planning at the deans, directors and associate-directors levels, through integrated research, extension and education projects and programs funded by Hatch, Smith-Lever and McIntire-Stennis formula funds and through competitive funding from NIFA and other sources.

WVSU continues to undergo organizational restructuring due to changes in University administration, programming needs, and decreasing federal and state appropriations. Despite this organizational evolution, the mission of the Institute continues to be one of delivering educational and life-long learning opportunities by conducting research, teaching and outreach services to improve the well-being of West Virginia citizens (particularly those traditionally under-served). Federal support continues to be a key success factor for the Institute. As additional state appropriations and other resources continue to be attained, the University carries on efforts to strengthen and extend its research and extension programming capacity and programs.

Federal support continues to be a key success factor for the WVSU-GRDI. As additional state appropriations and other resources continue to be attained, the University carries on efforts to strengthen and extend its research and extension programming capacity and programs The following report provides details of the programs supported by Evans-Allen, Section 1444 Program and McIntire-Stennis formula funds appropriated to 1890 Institutions and matching funds provided by the State of West Virginia.

As in the past, research programs of the WVU Agricultural and Forestry Experiment Station are coordinated with and supported by research programs at WVSU and by educational and outreach

programs of both West Virginia State and West Virginia University Extension. Supporting research at West Virginia State includes; genetic mapping for pest and disease resistance, as well as value-added traits in melon, watermelon, squash, pumpkin, tomatoes and peppers, and field trials of many vegetables and cut flowers; diet formulation in aquaculture; improving operation of poultry waste digesters and develop novel techniques for soil remediation on reclaimed mine lands.

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

The combined extension efforts of both Universities are addressing the most common problems facing families and communities in West Virginia which includes, a decreasing and aging population; a largely rural population with limited access to health and nutritional information and a consequent tendency towards poorly balanced, calorie dense diets; and an extreme need for environmentally friendly and sustainable economic development which will provide jobs to replace the many which have been lost in coal and timber harvesting industries.

This combined five year Plan of Work has ten program areas:

- Global Food Security and Hunger: Production/Sustainable Agriculture
- Climate Change and Environmental Quality
- Sustainable Energy
- Childhood Obesity, Nutrition, and Health
- Food Safety
- Community, Economic and Workforce Development
- Production/Sustainable Forestry
- Fundamental Plant and Animal Systems
- Strengthening Families
- Youth Development

Estimated Number of Professional FTEs/SYs total in the State.

Year	Extension		Research	
	1862	1890	1862	1890
2016	173.0	25.0	42.0	12.5

Estimated Number of Professional FTEs/SYs total in the State.

Year	Extension		Research	
	1862	1890	1862	1890
2017	173.0	25.0	42.0	12.5
2018	173.0	25.0	42.0	12.5
2019	173.0	25.0	42.0	12.5
2020	173.0	25.0	42.0	12.5

II. Merit Review Process

1. The Merit Review Process that will be Employed during the 5-Year POW Cycle

- Internal University Panel
- External University Panel
- External Non-University Panel

2. Brief Explanation

WEST VIRGINIA UNIVERSITY AGRICULTURAL AND FORESTRY EXPERIMENT STATION

A scientific merit and peer review process is used for all Hatch, McIntire Stennis and Animal and Health and Disease Acts is for all research projects. Projects are reviewed internally by individuals with expertise in the fields of science addressed in each proposal are selected by the Division Director, Experiment Station Director or designee and asked to judge technical merit, likelihood of achieving stated objectives, and potential impacts for each proposed project. A minimum of three peer scientists (i.e., individuals qualified by their status in the same discipline, or a closely related field of science), are asked to read and provide written comments on the proposed activities. The terms of reference for the reviewers focus on questions of the quality of the proposed science, technical feasibility of the research, the validity of the scientific approach, and likelihood for completing the stated objectives. Additional comments may be requested on a project's relevance to the station's priorities, the degree of integration with extension (as appropriate), responsiveness to stakeholder needs, and the accuracy of any claims for multi-disciplinary and multi-state collaboration. Reviewers are asked to present their findings in writing, and records of the reviewers' comments are preserved for the life of the project, or for a period of three years in the event that a project is not initiated. Competitively awarded grants requiring peer review or contract research requiring grantor approval are exempt from this process. Programs of research are reviewed annually by the Station visiting committee and every five years through a College level strategic planning process.

WEST VIRGINIA UNIVERSITY EXTENSION SERVICE

Extension Faculty Reviews

All WVUES specialists and county agents are appointed as faculty at West Virginia University. As such, they undergo the same faculty reviews as other university faculty and are promoted under the same protocol. Each year, every Extension faculty member submits a "Faculty Assignment Document" (FAD) which is similar to a plan of work. The FAD is approved by the unit director in 4-H Youth Development, Agriculture and Natural Resources, Community, Economic, and Workforce Development, and Families and Health. The plans are evaluated on how they meet the needs of West Virginia citizens and how they will produce measurable outcomes. In December of each year, every Extension faculty members submits a faculty file which contains productivity charts and accomplishment narratives related to teaching, service, and research. Depending on the years of service and whether the person is applying for promotion, the files are evaluated by their peers in their unit, their program unit director, an Extension-wide committee, the Dean and Director of WVUES, and the WVU Provost (for promotion years only).

Programmatic Reviews

Each unit director reviews the data collected through our reporting system each year and approves a program summary that has been written by the program team leaders and other specialists with assistance from the evaluation specialist. That summary report is used to report to NIFA and USDA.

The unit directors, at their weekly leadership meeting, discuss the direction of WVUES programs, develop plans of work, and collaborate with each other on mutually achievable goals and objectives. Most programs at WVUES contain evaluation components which are designed jointly by program directors and the evaluation specialist.

Project Reviews

All funded research and programmatic grants are reviewed by specialists and other faculty in the field, the unit director, and the WVU Sponsored Programs unit. The one exception is that WVU and WVUES offer faculty incentive grants that fund small start-up research and service projects, and these grants are not reviewed by the WVU Sponsored Programs unit. Final reports are reviewed and approved by unit directors. The financial aspects of all grants are reviewed and approved by the WVUES director of finance. All grant-funded projects contain evaluation components that document outputs and outcomes.

WEST VIRGINIA STATE UNIVERSITY RESEARCH AND EXTENSION

West Virginia State University (WVSU) utilizes a multi-faceted merit review process that includes faculty, staff, and stakeholders that are both internal and external to the Gus R. Douglass Land-Grant Institute. Merit review is performed annually by the joint Research and Extension Advisory Council (REAC). This group of stakeholders is comprised by WVSU faculty and staff, external stakeholders such as business leaders and other community members, and administrators and faculty from other land-grant institutions. REAC meets once a year to participate in Plan of Work development with Extension and Research faculty and staff members.

The REAC also conducts the external program evaluations. The Council consists of local stakeholders with a wide variety of backgrounds, business leaders and other community members considered as suitable stakeholders for Extension and Research efforts. The

evaluations from all these groups are utilized to help administrators prioritize and allocate funds to specific land-grant programs. Program direction specific to each area is developed through round-table discussions with faculty and staff members alongside the groups of the Council members. Each member of the Council is given background information and provided with the opportunity to assess and provide direct input into program development.

Beginning in 2013, faculty and administrators from WVU were invited to, and participated, in our REAC meeting. The interaction was extremely positive and has set the stage for additional, meaningful collaboration between our two land-grant universities.

In addition to this formal meeting of the Advisory Council, internal merit review of all programs and personnel occurs on an ongoing basis by the Associate Deans for Extension and Research. This process is accomplished through group and individual meetings with administrative and program staff on a continuing and regular schedule. Publications, professional society participation, student involvement and annual REEport submissions are used to provide continual evaluation, assessment and feedback.

III. Evaluation of Multis & Joint Activities

1. How will the planned programs address the critical issues of strategic importance, including those identified by the stakeholders?

Research and Extension faculty, specialists and staff at West Virginia University participate in multi-state projects to develop and deliver new knowledge and provide technical support to agriculture and forestry industries in West Virginia. Additionally, multistate research and outreach efforts focus on preserving state natural resources, enhancing rural economic development and improving the health, nutrition and lifestyle choices for citizens in rural Appalachian communities.

Resources from multiple universities, organizations and agencies are applied through multi-state research and outreach projects to improve yield and efficiency of production methods for forages and grazing livestock; to increase profitability of organic production of vegetables and fruits, economic growth through development of outdoor recreation and tourism opportunities, and reducing obesity and osteoporosis in rural West Virginia communities; to develop sustainable management systems for, and new products from, Appalachian hardwoods; to minimize negative effects on state natural resources from economic activity; to better understand the impacts of natural resource policy and assessment measures on environmental and economic well-being; and to define habitat requirements and management systems required to maintain West Virginia plant and animal wildlife populations.

WVUES specialists continue to work closely with WVSU on a tomato grafting project, variety trials of vegetables, cut flowers and a high tunnel professional development project, as part of a multi-state Northeast Sustainable Agriculture Research and Education (NESARE) program to support food business workshops around the state. WVUES and WVSU faculty are also jointly working on a NIFA grant in integrated pest management.

WV State University research scientists and extension professionals cultivate links to individuals, institutions, and organizations throughout the state, country and abroad to tailor projects to specific needs expressed by stakeholders. WVSUs planned programs are closely coordinated with those of WVU, so that no duplication of effort occurs and also to take advantage of collaborative opportunities. Regular communication between the two universities fosters this working relationship. This year, a joint committee of Community Resource

Education Development (CRED) faculty was initiated. This committee has examined all of the related indicators in our Federal Report of Accomplishments and have divided into teams that are working on collecting impact data to measure the success of joint programs.

Issues related to the protection of the environment and its natural resources, such as climate change and sustainable bioenergy, are considered critical in West Virginia as the chemical and coal industries have had impacts on water quality, soil conservation, wildlife, and natural resources. Thus, planned programs at WVSU have an environmental component that can provide solutions to these problems, and facilitate better management of the environment and its resources. Additionally, due to generational health problems, a great deal of focus is given to childhood obesity, food security, and food safety. Only by addressing these basic issues can our educational efforts begin to help West Virginians solve their long-term problems.

2. How will the planned programs address the needs of under-served and under-represented populations of the State(s)?

Historically, West Virginia has been an economically depressed state. As a result, from an income perspective, many of the state's citizens are considered under-served and/or underrepresented. Landowners are a primary focus of extension and research programs for both WVU and WVSU, with various consumer, agricultural, environmental, family and business issues being addressed.

Small farms benefit from plant genomics research at WVSU to improve insect and disease resistance of vegetable crops, potentially reducing cost and improving yield. Agricultural, municipal and industrial processes have significant economic and environmental impact on local communities around the state. The renewable resources and environment program explores value added efforts to address this issues.

Additionally, WVSU Extension programs focused on strengthening families, assist business owners and communities in utilizing available resources in an efficient and effective manner. The planned programs also have a target of addressing long-term health issues in West Virginia, such as childhood obesity, through increasing nutrition education and health awareness programming.

WVU Experiment Station faculty and staff work cooperatively with colleagues in the WVU Extension Service, WVSU Extension and Research Programs, and WVU Health Sciences Center Department of Community Medicine to deliver information and technical support most needed by these citizens. The Community Design Team, a joint effort with WVU Extension, will continue to assist disadvantaged communities to plan for the future and to pursue economic and cultural development opportunities.

Research and outreach programs in production agriculture and forestry are conducted jointly with WVUES and focus on the often under-served, smaller, family owned operations which are typical in West Virginia. Similarly, programs in food quality, food safety, and human nutrition and health are directed largely at concerns and situations characteristic of smaller, less affluent, rural communities, again those typically under served. Additionally, Station programs supporting economic development, quality of life and protection of natural environments are directed toward developing ways in which smaller, rural communities can capitalize on existing resources to enhance economic development and improve quality of life in the community. Experiment Station faculty are encouraged to participate in cooperative, multi-state projects with address these issues.

WVU Extension Service monitors its multi-state and integrated programs to assure compliance with social justice and diversity guidelines. In addition, WVUES partners with WVSU Extension staff on programs aimed at minority populations situated in the southern parts of the state.

3. How will the planned programs describe the expected outcomes and impacts?

Most joint and integrated research and Extension programs at WVU and WVSU share a common goal of contributing to economic growth and community well-being by helping to develop technologies that utilize resources which are relatively unique to West Virginia and readily accessible to state citizens, in order to produce competitive advantages for state entrepreneurs. Other programs focus on development and delivery of methods for understanding, analyzing and solving state wide issues, including human nutrition (osteoporosis, obesity, cardiovascular disease, etc.), environmental quality and natural resource conservation.

Expected outcomes and impacts from these programs will be described in terms of economic growth and industry expansion (aquaculture, pasture finished livestock, hardwood utilization, etc.); development of a sustainable agriculture and food production system; improved public health demographics, literacy rates and life skills for youth and adult citizens in urban and rural WV communities (healthier diets reduced incidence of obesity, diabetes and cardiovascular disease, fewer cases of osteoporosis, etc.), increases in knowledge gained through basic research activities, technology transfer resulting from basic and applied research efforts, enhanced soil and water quality, and improved aquatic and terrestrial wildlife habitat.

4. How will the planned programs result in improved program effectiveness and/or

Multi-state research and joint research-extension efforts are critical to the success of programs conducted by the WVU Agricultural and Forestry Experiment Station. The Station lacks the critical mass of scientists needed to achieve reasonable progress in the development of technologies to support economic development and improved quality of life for State citizens. Joint research programs involving scientists from other states and from West Virginia State University, are therefore necessary to meet expectations for technology development. Memorandums of understanding with Penn State and the University of Maryland are in place, to share extension and research resources regionally, rather than station by station, to support regional tree fruit industry. Station efforts to enhance state-wide economic development and improve quality of life require joint research-extension programs to develop and deliver outreach programs which will achieve the understanding and adoption of new technology, improved management systems, steps to healthier lifestyles, more informed personal choices, etc.

Each of the WVUES programs undergoes a systematic annual program planning and review process involving individual faculty, supervisors, program team members, and central administration. Individual faculty members are assigned to a program unit which is responsible for one to three planned programs. Efforts have been made to break down barriers keeping faculty members from contributing to planned programs that are not in their own program unit, such as activities in global food security, climate control, and sustainable energy that result in a more efficient workforce in West Virginia. One strategy is to emphasize goals and objectives of program areas during reporting rather than the program units themselves. This process drives programs toward continuous improvement in effectiveness and efficiency by helping faculty

and staff members see that activities and initiatives are a means to achieving the overall goals. Program teams also provide focus to planning that enhances each planned program. Membership in the teams is voluntary, but most faculty members join at least one team because participation is a means of enhancing collaboration and scholarship.

Extension and Research programs at WV State University continue to evolve based on the outputs and outcomes measured from past projects. The respective administrative units continuously review all projects within program areas. The projects and programs that progress and produce yearly outputs, and demonstrate the potential for longer term outcomes have been selected for further funding in this current plan of work. Specific benefits to each program through integrated, joint and multi-state cooperation include: competitive and sustainable agricultural and community systems increase intellectual capacity through University and Federal Links; access to novel plants and genetic materials; better opportunity to obtain external grant funding, access to more resources for extension and research activities; access to improved facilities and resources; and increased opportunity to develop novel research proposals and extension program efforts. Sustainable Environment and Renewable Resources increase access to resources not available at WVSU and increased intellectual capacity.

IV. Stakeholder Input

1. Actions taken to seek stakeholder input that encourages their participation

- Use of media to announce public meetings and listening sessions
- Targeted invitation to traditional stakeholder groups
- Targeted invitation to non-traditional stakeholder groups
- Targeted invitation to traditional stakeholder individuals
- Targeted invitation to non-traditional stakeholder individuals
- Targeted invitation to selected individuals from general public
- Survey of traditional stakeholder groups
- Survey of traditional stakeholder individuals
- Survey of selected individuals from the general public

Brief explanation.

Both West Virginia University and West Virginia State University have a communications entity with a specific Extension and Research focus. The purpose of the communications entity is to increase capacity for contacting traditional and non-traditional stakeholders, informing them of program activity and seeking direct input on developing activities. These units coordinate a wide variety of promotional activities to increase non-traditional stakeholder awareness of the Extension service and research station at each institution. Communications entities coordinate social media interactions, including Twitter and Facebook, with an idea of making the universities more accessible and allow for ease of feedback in addition to program promotion.

At both institutions town hall meetings have proven essential to identify community stakeholders and their needs for Extension education. Feedback from stakeholders in the past has shown the need for programs that address environmental and natural resources issues, high unemployment, illiteracy among adults, teen pregnancy, inadequate nutrition, lack of activities for children and youth after school and the digital divide. Programmatic efforts are directed toward these issues. Partnerships with community-based organizations have also been useful to retrieve information pertinent to the needs of our stakeholders. Faith based organizations have been useful

to affiliate with by serving as a resource center and broker for the communities and the University. Program leaders and administrators take advantage of special public events such as WVU and WV State University Day at the Capitol and the WV State Fair to gather stakeholder input, as well as disseminate information and create public awareness of programs.

At WVSU, potential stakeholders are invited to participate on a review panel to evaluate the University's land-grant research programs. Research administrators and scientists seek individuals and groups within a specific area of expertise or understanding to provide input and shape the direction of the research programs in order to better address the needs of those individuals or groups. Several collaborations have been formed as a result of these activities. Traditional stakeholder groups include industry, departments of agriculture, and individual farmers. Non-traditional groups include non-profit environmental organizations, alternative energy groups and cooperatives, and under-served landowners who have been impacted by mineral extraction.

WVU-Extension Service utilizes special events where the public gathers, such as the WVU Day at the Legislature and the West Virginia State Fair, to gather post-evaluative information on stakeholders' satisfaction, as well as, gather evaluative information at most educational events all year round. This information is beneficial to learning participant satisfaction and how they have benefited. Results of these evaluative efforts are generally positive, but critical comments are always used to inform program improvement.

Much stakeholder input for the WV University Research Programs is collected in conjunction with WVU Extension, since a majority of stakeholders are shared. Meetings with a sole purpose of gathering stakeholder input have been discontinued in favor of utilizing meetings with other primary purposes. This new procedure is more efficient and represents a larger and more diverse segment of our stakeholders. Input also originates from various advisory groups associated with specific interest areas within College Divisions, as well as from advisory groups established at the College/Station level.

2(A). A brief statement of the process that will be used by the recipient institution to identify individuals and groups stakeholders and to collect input from them

1. Method to identify individuals and groups

- Use Advisory Committees
- Use Internal Focus Groups
- Use External Focus Groups
- Open Listening Sessions
- Needs Assessments
- Use Surveys

Brief explanation.

The joint WVSU Research and Extension Advisory Committee (REAC) consists of several individuals representing the different areas addressed by the programs pertinent to Extension and research. Target areas are defined based on the Extension and research portfolio at the Institution. Within each target area (e.g. farm owners, government agencies, families, small businesses, industry, etc.) individuals are identified and invited to participate. The individuals advise the Extension faculty and staff and the research scientists on possible stakeholders and issues important to those stakeholders. The individual Extension faculty and research scientists attend professional seminars, special interest meetings and other

relevant conferences and have identified stakeholders through interactions with groups or individuals interested in our areas of expertise.

WVU Extension faculty and staff continue to use internal and external needs assessments to identify stakeholders, as well as joint advisory committees of professional associations (such as the Farm Bureau, CEOS, Future Farmers of America, the Cattleman's Association, the Poultry Association, the Oil and Gas Association, the AFL-CIO, and the Firefighters Association). These committees link WVUES to individuals who are interested in supporting extension efforts. Faculty and staff members continue to be active in the WV Legislature where they hear about programs, initiatives, and funding that will bolster the work of Extension and recruit legislators to support Extension's goals.

WVU Research Programs continue to work with Extension, state agencies and internally through the divisional directors to develop a more extensive and current data base for commodity and community organizations that encompass a more comprehensive scope for College programs and activities. This data base is critical for improved communication from the College via all forms of information media. Efforts have been initiated with the communication specialist for the College to assess the need and potential to re-establish a College level newsletter. The College currently has two alumni associations, the College and the Division of Natural Resources and Forestry. Recommendations have been made to the leadership of the College Alumni Association for potential changes in the meeting and banquet venues to link with other activities in the College and improve participation and grow this association in support of the College. In addition, consideration should be given to explore concept to merge the two alumni associations into one.

2(B). A brief statement of the process that will be used by the recipient institution to identify individuals and groups who are stakeholders and to collect input from them

1. Methods for collecting Stakeholder Input

- Meeting with traditional Stakeholder groups
- Survey of traditional Stakeholder groups
- Meeting with traditional Stakeholder individuals
- Survey of traditional Stakeholder individuals
- Meeting with the general public (open meeting advertised to all)
- Meeting specifically with non-traditional groups
- Meeting specifically with non-traditional individuals
- Meeting with invited selected individuals from the general public
- Survey of selected individuals from the general public

Brief explanation.

West Virginia State University employs population appropriate actions to garner and utilize stakeholder input. The communications unit coordinates a wide variety of promotional activities to increase non-traditional stakeholder awareness of WVSU research and Extension programs. Input is collected during the research and Extension advisory review through a specific survey and at the meetings. Minutes and surveys are collected and analyzed to guide the programming process of each semester-cycle.

WVUES leadership meets weekly to discuss feedback received from multiple sources. The Evaluation Specialist keeps leaders informed about our program outcomes and how they can inform decision making. This information is used to improve operations and programming and often to address problems raised by our constituency. The budget is often a focus of discussion, and decisions are made in response to stakeholder feedback. Assessment data is processed at the state level for most programs. Currently, there are about 15 program teams that meet quarterly or as needed. These teams, consisting of agents, specialists, and upper-level staff, have the responsibility of making recommendations to WVUES administration about new programming based on emerging needs in the state. Membership in the teams is fairly consistent, but members may resign and join other teams, based on their plan of work.

West Virginia University Research Programs distribute surveys at annual meetings for numerous organizations having interest in College program areas (related to agriculture, forestry, landscape architecture, interior design, human nutrition, etc.) to provide input. Division directors, college faculty and advisory groups are queried regularly and routinely to identify industries, groups or subject matter areas needing representation in the College input stream and for specific individuals to fill these roles.

3. A statement of how the input will be considered

- In the Budget Process
- To Identify Emerging Issues
- Redirect Extension Programs
- Redirect Research Programs
- In the Action Plans
- To Set Priorities

Brief explanation.

Stakeholder input is vital to maintain the relevance of WV State University's Extension and Research Programs. Program leaders and administration receive stakeholder input at the programmatic level on a continual basis. Faculty and field staff members use formal and informal methods (including local advisory councils) to evaluate information and utilize it in an efficient and effective manner for program development. The information culled from all of these interactions assists in developing plans to meet the needs of the state and expand the knowledge of the scientific community. Emerging issues in a specific field may redirect the program, or eliminate the need for a specific project within the program. Programmatic staffing is based in part on the need and importance of that project or program to stakeholders. WVSU stakeholders not only provide feedback on the Plan of Work, but are engaged in shaping the writing of the Plan of Work directly as well.

WVU Extension Service considers the needs of stakeholders when budget decisions. In the past, a priority has been placed upon expanding and enhancing the role of Extension at the county level. This will continue to be a priority. New and emerging issues are identified through assessment of stakeholders. Examination of WV health, social, and economic statistics will help us understand the needs of state citizens.

Stakeholder input as it relates to the College/Station research portfolio at WV University is discussed regularly with College advisory groups and within College administrative groups, particularly when work plans are being prepared or when staffing decisions are pending. Such input will be included in our strategic planning processes

V. Planned Program Table of Content

V(A). Planned Program (Summary)

Program # 1

1. Name of the Planned Program

Global Food Security and Hunger

2. Brief summary about Planned Program

The Global Food Security and Hunger plan of work has five goals:1) increase food supply and quality; 2) engage individuals in the promotion, support, and sustainability of horticulture; 3) expand marketing opportunities for value-added products and develop food systems that support local consumers and local business; 4) enhance agricultural knowledge; and 5) build volunteer capacity related to agriculture.

- Animal Production and Management: WVUES activities include those that address animal health, livestock production, animal product marketing, grassland management, and aquaculture. Experiment station research projects at the Davis College include pasture-raised and pasture-finished beef; cool water aquaculture; increasing real or perceived product value in specialty or out-of-season markets such as lamb and organic products; long-term organic farming research involving plant systems, animal systems and integrated plant and animal systems.
- Horticulture: Major initiatives conducted by WVUES include consumer and commercial horticulture and the Extension Master Gardener program.
- Pest Management: WVUES major initiatives include integrated pest management, white-tailed deer damage program, weed control management, and Extension Master Gardener.
- Sustainable Agriculture - Agriculture Business/Small Farm Management: Major initiatives conducted by WVUES include West Virginia Small Farms Conference and Small Farms website. Additionally, WV State University offers a diverse research and extension portfolio related to improving food production and security. Research scientists and extension specialists work to develop and implement a variety of initiatives designed to improve crop management techniques, provide new and more resilient horticultural and aquaculture crops through breeding and genome analysis, and generally improve the ability of the agriculture industry, especially small-scale farms, to increase productivity in an environmentally and efficient manner.
- Nutrient Management: WVUES major initiatives include fertilizer use and selection, soil sampling, and composting.
- Agriculture Literacy: WVUES major initiatives include Agriculture in the Classroom and 4-H youth agriculture activities, including judging, skillathons, and fairs and festivals. WV State University extension staff members are working with residents at the community level to re-engage in local food production through community gardens, urban small fruit orchards, and vertical production systems. Extension professionals are training residents, local government members, and non-profit agencies on best management practices for small scale food production, targeting food security and sustainability in urban settings.

Research in the WVU Agricultural and Forestry Experiment Station for this area involves applied research in plant and animal production systems. Projects are focused on increasing the productivity and sustainability of agriculture thereby contributing both to food security and alleviating world hunger. Because of the applied nature of this research, many of the programs in this area are integrated, including low input agriculture, production on disturbed soils, organic pest and disease management, organic farming systems and poultry diet formulations and pellet structure.

3. Program existence : Mature (More then five years)

4. Program duration : Long-Term (More than five years)

5. Expending formula funds or state-matching funds : Yes

6. Expending other than formula funds or state-matching funds : Yes

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
101	Appraisal of Soil Resources	10%	10%	10%	0%
102	Soil, Plant, Water, Nutrient Relationships	10%	10%	10%	0%
111	Conservation and Efficient Use of Water	0%	10%	0%	0%
201	Plant Genome, Genetics, and Genetic Mechanisms	0%	0%	0%	30%
202	Plant Genetic Resources	0%	0%	5%	30%
205	Plant Management Systems	10%	10%	10%	11%
211	Insects, Mites, and Other Arthropods Affecting Plants	0%	10%	10%	0%
212	Diseases and Nematodes Affecting Plants	0%	0%	10%	0%
216	Integrated Pest Management Systems	10%	0%	5%	0%
301	Reproductive Performance of Animals	0%	0%	10%	0%
302	Nutrient Utilization in Animals	0%	0%	15%	29%
307	Animal Management Systems	15%	0%	10%	0%
308	Improved Animal Products (Before Harvest)	10%	0%	0%	0%
313	Internal Parasites in Animals	0%	0%	5%	0%
403	Waste Disposal, Recycling, and Reuse	0%	10%	0%	0%
405	Drainage and Irrigation Systems and Facilities	0%	10%	0%	0%
503	Quality Maintenance in Storing and Marketing Food Products	10%	0%	0%	0%
604	Marketing and Distribution Practices	10%	10%	0%	0%
607	Consumer Economics	10%	10%	0%	0%
806	Youth Development	5%	10%	0%	0%
	Total	100%	100%	100%	100%

V(C). Planned Program (Situation and Scope)

1. Situation and priorities

West Virginia agriculture is dominated by high intensity poultry production and low intensity pasture-fed ruminant production. Much of the land in West Virginia is characterized by steep slopes and high rates of erosion that are suitable to pasture but not to intensive row-crop production. Most intensive crop production, including some fruits and vegetables, is limited to those regions of the state that have relatively flat terrain and favorable soil characteristics. Landowners in rural and urban settings are dealing with a variety of issues related to the management of agricultural and natural resources in West Virginia. Some of these issues include the fragmentation of farmlands, losses of revenue generating enterprises, sustainable land-management practices in urban and rural settings, and out-sourcing (outside of WV and the US) of agriculture. To be competitive, West Virginia producers must increase the value of what they produce or reduce transportation and production costs by relying on locally-marketed products, by taking advantage of the State's proximity to major urban markets or by developing niche products.

Many farmers are turning to Extension and Research for education on alternative agricultural endeavors. Our programmatic focus is on sustainable small farms, aquaculture, and specialty crop production, as well as youth horticulture education. Specific strategies include avoiding enterprises which require extensive amounts of mechanical tillage or harvest; reducing costs of major inputs such as feed, labor, and facilities; focusing on higher value products; increasing real or perceived product value in specialty, niche or out-of-season markets; diversifying product offerings; taking advantage of proximity to markets, etc.

The objective of the research program in the West Virginia Agricultural and Forestry Experiment Station is to generate new knowledge with positive impact on economic activities for which state producers have some degree of competitive advantage. Station research will focus on economic activities meeting one, or more often multiple, circumstances listed above and generally having land as a primary input. Examples include forage production / livestock grazing; poultry production; organically produced vegetables, fruits and/or animal products; production of ornamental plants; and cool water aquaculture for food and sport fishing. Our programs emphasize pooling of producer resources and assisting producers in complying with market regulations.

2. Scope of the Program

- In-State Extension
- In-State Research
- Multistate Research
- Multistate Extension
- Integrated Research and Extension
- Multistate Integrated Research and Extension

V(D). Planned Program (Assumptions and Goals)

1. Assumptions made for the Program

For the foreseeable future, West Virginia will remain a largely rural state with a need for economic activities which thrive in non-urban settings. Land-based enterprises operate naturally and logically in rural settings. Many rural West Virginia citizens own land which can be a valuable input, as well as a major input, to such enterprises.

Applied agricultural research at the WV Agricultural and Forestry Experiment Station will lead to greater competitiveness and profitability for farmers in the State and region.

Developing new varieties for production with improved pest resistance improves the management efficiency and hence profitability of farmers.

Feeder cattle marketing pools, board sales, and web-based and Internet sales will expand the market for WV producers.

As consolidation continues in the beef industry and more export regulations are introduced, producers will need assistance with staying in compliance or face a loss of market opportunity.

Proper management of water resources in a sustainable fashion can result in products that can contribute supplementary income to landowners and to their quality of life. In the process of growing and selling fish, impacts may accrue to the community, and the tourism industry through production of healthful foods.

Training, demonstrating and mentoring are important components in developing food security and preventing hunger.

Funding can be identified and secured for the support of food security programs. There are numerous partners that can assist in the achievement of these programs.

The food security programs are in-line with the direction being set by local, county, and state stakeholders.

2. Ultimate goal(s) of this Program

To generate information which will contribute to a diverse and robust rural economy based on responsible and sustainable use of land, water and air.

To enhance the productivity and profitability of farmers and agribusinesses in the State.

To produce a safe, abundant, and affordable food supply by improving and promoting animal health, marketing, use of pesticides, use of risk mitigation techniques, and control of predation.

To assist rural and urban landowners in utilizing agricultural practices and systems that are sustainable, take advantage of the latest agriculture research, minimize impact on the environment, and create the alternative agriculture expansion, particularly among minority and previously underserved participants.

V(E). Planned Program (Inputs)

1. Estimated Number of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890
2016	17.0	2.0	10.0	6.5

2017	17.0	4.0	10.0	6.5
2018	17.0	4.0	10.0	6.5
2019	17.0	4.0	10.0	6.5
2020	17.0	4.0	10.0	6.5

V(F). Planned Program (Activity)

1. Activity for the Program

WVUSW will ensure that agriculture and food production will be sustainable and profitable and will produce a safe, abundant, and affordable food supply by improving and promoting animal health, marketing, use of pesticides, use of risk mitigation techniques, and control of predation. Extension faculty and staff will be involved in local and regional efforts to train local producers, landowners, and agricultural workers in skills related to production of agricultural products, production of value-added products, agricultural business and jobs skills, and marketing agricultural products.

At WVUES, the following planned program activities will be emphasized: 4-H youth agriculture, aquaculture, feeder cattle marketing, livestock improvement, grassland management, livestock judging, homeowner and commercial horticulture, insect and disease monitoring, livestock improvement, integrated pesticide certification, and small ruminants. On-line educational programs, seminars such as the Summer Agriculture Institute and the Small Farms Conference, workshops, fact sheets, social media, new curricula and individual and group consultations will be used to educate WV citizens, youth development professionals, and extension faculty members.

Training programs will be developed to improve skills in livestock improvement, fruit and vegetable production, aquaculture, pest management, horticulture, artificial insemination, embryo transfer, pregnancy testing, birthing techniques, integrated internal parasite prevention, conservation, construction of high and low tunnels, marketing techniques, government regulations, methods for managing risk, cost of production analyst, and estate planning and business generational transition.

WVSU Extension will assist in the development of alternative agricultural endeavors to assist farmers increasing their revenues. They will work to maximize utilization of best practices in the field of cultivation, selection, and maintenance. They will increase knowledge levels in alternative enterprises that may expand profits for small farm operators. They will work with commercial growers of greenhouse and nursery management, cut flower production, and fruit and vegetable production. Additionally, there is an emerging interest in the development of green spaces in our urban centers and municipalities. They will continue to offer the Junior Master Gardener program to youth from pre-k to age 18.

The Experiment Stations will conduct research; report results in scientific manuscripts, technical and popular presentations; train graduate students. They will generate applied research that is useful to the profession and to producers within the State and conduct outreach activities in conjunction with Extension to disseminate the results of that applied research in a way that is understandable and useful to State farmers and agribusinesses.

At WVSU, research programming will continue to focus efforts in areas of: aquaculture, genetic mapping, genomics and breeding of selected vegetables and fruits, and trialing of vegetables.

WVSU researchers plan to develop pest resistant indeterminate tomato varieties with superior

organoleptic traits for protected culture production. We will assess existing greenhouse, high tunnel and heirloom tomato varieties for use by growers as well as breeding tomatoes for protected culture. Second we will verify existing molecular markers for disease and pest resistance and other traits of interest. If markers cannot be verified then new markers will be developed. Finally, we will use these verified markers to incorporate traits to develop new cultivars for release.

WVSU aquaculture researchers will continue to perform analyses and feeding trials on interactive effects of fish meal- and plant protein-based diets and water temperature, on growth performance characteristics, feed utilization and mitochondrial function in rainbow trout.

Watermelon plants do not grow well in acidic soils of West Virginia. WVSU researchers identified bottle gourd (Lagenaria siceraria), a plant native to southern Africa, which can grow well in acidic soils and also is tolerant to Fusarium Wilt and drought stress. We performed grafting watermelon as scion and Lagenaria as root-stock. This technique helps watermelon to grow well in the state of West Virginia. However, our field experiments concluded that the grafting reduced fruit quality in watermelon. We have currently undertaken genomic driven improvement of fruit quality in watermelon.

2. Type(s) of methods to be used to reach direct and indirect contacts

Extension

Direct Methods	Indirect Methods
● Education Class ● Workshop ● Group Discussion ● One-on-One Intervention ● Demonstrations	● Newsletters ● Web sites other than eXtension

3. Description of targeted audience

The target audience for this program area includes beef, dairy, and aquaculture producers, large and small growers of horticultural products, processors, distributors, agricultural consultants, regulators, homeowners, shepherds, pesticide applicators, certified nutrient managers, fish feed manufacturers, federal agencies youth livestock exhibitors, volunteers, minority farmers, policy makers and other researchers, and Extension specialists and agents.

V(G). Planned Program (Outputs)

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
  - Direct Adult Contacts
  - Indirect Adult Contacts
  - Direct Youth Contacts
  - Indirect Youth Contact
- Number of patents submitted
- Number of peer reviewed publications

☐ Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(H). State Defined Outputs

1. Output Measure

- Number of general press articles
- Number of educational materials create or updated
- Number of workshops and other educational presentations for clients
- Number of professional/academic presentations
- Number of graduate students earning degrees

☐ Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(I). State Defined Outcome

O. No	Outcome Name
1	Number of participants (youth and adults) who improve or increase skills in farm management
2	Number of participants who increase or improve skills in animal production and health.
3	Number of participants who increase or improve skills in weed or pest management.
4	Number of participants who increase or improve skills in aquaculture.
5	Number of participants who increase or improve a skill in nutrient management.
6	Number of producers indicating adoption of recommended or best practices.
7	Number of people certified or licensed to practice in the field.
8	Number of new groups or organizations that are established or enhanced.
9	Number of producers who utilize best practices with alternative agricultural enterprises to diversify their income portfolio.
10	Development of a new diet formulation for rainbow trout.
11	Development of value-added, disease resistant cultivars.
12	Increase in the number of producers and other members of the food supply chain.
13	Growth in state sales of beef- % increase.
14	Growth in state broiler, egg and turkey sales- annual % increase.

Outcome # 1

1. Outcome Target

Number of participants (youth and adults) who improve or increase skills in farm management

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 205 - Plant Management Systems
- 216 - Integrated Pest Management Systems
- 307 - Animal Management Systems
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension
- 1890 Research

Outcome # 2

1. Outcome Target

Number of participants who increase or improve skills in animal production and health.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 202 - Plant Genetic Resources
- 205 - Plant Management Systems
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Diseases and Nematodes Affecting Plants
- 216 - Integrated Pest Management Systems
- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 307 - Animal Management Systems

- 308 - Improved Animal Products (Before Harvest)
- 313 - Internal Parasites in Animals
- 403 - Waste Disposal, Recycling, and Reuse
- 405 - Drainage and Irrigation Systems and Facilities
- 503 - Quality Maintenance in Storing and Marketing Food Products
- 604 - Marketing and Distribution Practices
- 607 - Consumer Economics
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension
- 1890 Research

Outcome # 3

1. Outcome Target

Number of participants who increase or improve skills in weed or pest management.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 202 - Plant Genetic Resources
- 205 - Plant Management Systems
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Diseases and Nematodes Affecting Plants
- 216 - Integrated Pest Management Systems
- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 307 - Animal Management Systems
- 308 - Improved Animal Products (Before Harvest)
- 313 - Internal Parasites in Animals
- 403 - Waste Disposal, Recycling, and Reuse
- 405 - Drainage and Irrigation Systems and Facilities
- 503 - Quality Maintenance in Storing and Marketing Food Products
- 604 - Marketing and Distribution Practices
- 607 - Consumer Economics

- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 4

1. Outcome Target

Number of participants who increase or improve skills in aquaculture.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 202 - Plant Genetic Resources
- 205 - Plant Management Systems
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Diseases and Nematodes Affecting Plants
- 216 - Integrated Pest Management Systems
- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 307 - Animal Management Systems
- 308 - Improved Animal Products (Before Harvest)
- 313 - Internal Parasites in Animals
- 403 - Waste Disposal, Recycling, and Reuse
- 405 - Drainage and Irrigation Systems and Facilities
- 503 - Quality Maintenance in Storing and Marketing Food Products
- 604 - Marketing and Distribution Practices
- 607 - Consumer Economics
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension
- 1890 Research

Outcome # 5

1. Outcome Target

Number of participants who increase or improve a skill in nutrient management.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 202 - Plant Genetic Resources
- 205 - Plant Management Systems
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Diseases and Nematodes Affecting Plants
- 216 - Integrated Pest Management Systems
- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 307 - Animal Management Systems
- 308 - Improved Animal Products (Before Harvest)
- 313 - Internal Parasites in Animals
- 403 - Waste Disposal, Recycling, and Reuse
- 405 - Drainage and Irrigation Systems and Facilities
- 503 - Quality Maintenance in Storing and Marketing Food Products
- 604 - Marketing and Distribution Practices
- 607 - Consumer Economics
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension
- 1890 Research

Outcome # 6

1. Outcome Target

Number of producers indicating adoption of recommended or best practices.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 202 - Plant Genetic Resources
- 205 - Plant Management Systems
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Diseases and Nematodes Affecting Plants
- 216 - Integrated Pest Management Systems
- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 307 - Animal Management Systems
- 308 - Improved Animal Products (Before Harvest)
- 313 - Internal Parasites in Animals
- 403 - Waste Disposal, Recycling, and Reuse
- 405 - Drainage and Irrigation Systems and Facilities
- 503 - Quality Maintenance in Storing and Marketing Food Products
- 604 - Marketing and Distribution Practices
- 607 - Consumer Economics
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension
- 1890 Research

Outcome # 7

1. Outcome Target

Number of people certified or licensed to practice in the field.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 202 - Plant Genetic Resources
- 205 - Plant Management Systems
- 211 - Insects, Mites, and Other Arthropods Affecting Plants

- 212 - Diseases and Nematodes Affecting Plants
- 216 - Integrated Pest Management Systems
- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 307 - Animal Management Systems
- 308 - Improved Animal Products (Before Harvest)
- 313 - Internal Parasites in Animals
- 403 - Waste Disposal, Recycling, and Reuse
- 405 - Drainage and Irrigation Systems and Facilities
- 503 - Quality Maintenance in Storing and Marketing Food Products
- 604 - Marketing and Distribution Practices
- 607 - Consumer Economics
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension
- 1890 Research

Outcome # 8

1. Outcome Target

Number of new groups or organizations that are established or enhanced.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 202 - Plant Genetic Resources
- 205 - Plant Management Systems
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Diseases and Nematodes Affecting Plants
- 216 - Integrated Pest Management Systems
- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 307 - Animal Management Systems
- 308 - Improved Animal Products (Before Harvest)
- 313 - Internal Parasites in Animals

- 403 - Waste Disposal, Recycling, and Reuse
- 405 - Drainage and Irrigation Systems and Facilities
- 503 - Quality Maintenance in Storing and Marketing Food Products
- 604 - Marketing and Distribution Practices
- 607 - Consumer Economics
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension
- 1890 Research

Outcome # 9

1. Outcome Target

Number of producers who utilize best practices with alternative agricultural enterprises to diversify their income portfolio.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 202 - Plant Genetic Resources
- 205 - Plant Management Systems
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Diseases and Nematodes Affecting Plants
- 216 - Integrated Pest Management Systems
- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 307 - Animal Management Systems
- 308 - Improved Animal Products (Before Harvest)
- 313 - Internal Parasites in Animals
- 403 - Waste Disposal, Recycling, and Reuse
- 405 - Drainage and Irrigation Systems and Facilities
- 503 - Quality Maintenance in Storing and Marketing Food Products
- 604 - Marketing and Distribution Practices
- 607 - Consumer Economics
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension
- 1890 Research

Outcome # 10

1. Outcome Target

Development of a new diet formulation for rainbow trout.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 302 - Nutrient Utilization in Animals
- 307 - Animal Management Systems
- 308 - Improved Animal Products (Before Harvest)

4. Associated Institute Type(s)

- 1862 Research
- 1890 Research

Outcome # 11

1. Outcome Target

Development of value-added, disease resistant cultivars.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 202 - Plant Genetic Resources
- 205 - Plant Management Systems
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Diseases and Nematodes Affecting Plants

4. Associated Institute Type(s)

- 1862 Research
- 1890 Research

Outcome # 12

1. Outcome Target

Increase in the number of producers and other members of the food supply chain.

2. Outcome Type : Change in Condition Outcome Measure

3. Associated Knowledge Area(s)

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 202 - Plant Genetic Resources
- 205 - Plant Management Systems
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Diseases and Nematodes Affecting Plants
- 216 - Integrated Pest Management Systems
- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 307 - Animal Management Systems
- 308 - Improved Animal Products (Before Harvest)
- 313 - Internal Parasites in Animals
- 403 - Waste Disposal, Recycling, and Reuse
- 405 - Drainage and Irrigation Systems and Facilities
- 503 - Quality Maintenance in Storing and Marketing Food Products
- 604 - Marketing and Distribution Practices
- 607 - Consumer Economics
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension
- 1890 Research

Outcome # 13

1. Outcome Target

Growth in state sales of beef- % increase.

2. Outcome Type : Change in Condition Outcome Measure

3. Associated Knowledge Area(s)

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 202 - Plant Genetic Resources
- 205 - Plant Management Systems
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Diseases and Nematodes Affecting Plants
- 216 - Integrated Pest Management Systems
- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 307 - Animal Management Systems
- 308 - Improved Animal Products (Before Harvest)
- 313 - Internal Parasites in Animals
- 403 - Waste Disposal, Recycling, and Reuse
- 405 - Drainage and Irrigation Systems and Facilities
- 503 - Quality Maintenance in Storing and Marketing Food Products
- 604 - Marketing and Distribution Practices
- 607 - Consumer Economics
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 14

1. Outcome Target

Growth in state broiler, egg and turkey sales- annual % increase.

2. Outcome Type : Change in Condition Outcome Measure

3. Associated Knowledge Area(s)

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 202 - Plant Genetic Resources
- 205 - Plant Management Systems
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Diseases and Nematodes Affecting Plants
- 216 - Integrated Pest Management Systems
- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 307 - Animal Management Systems
- 308 - Improved Animal Products (Before Harvest)
- 313 - Internal Parasites in Animals
- 403 - Waste Disposal, Recycling, and Reuse
- 405 - Drainage and Irrigation Systems and Facilities
- 503 - Quality Maintenance in Storing and Marketing Food Products
- 604 - Marketing and Distribution Practices
- 607 - Consumer Economics
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges

Description

{NO DATA ENTERED}

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

Extension programs are evaluated using pre- and post-surveys, focus groups, interviews, standard assessments, and the like. General program evaluations are also utilized.

Experiment Station research program evaluation will take place at two levels and on two different time cycles. All programs will be evaluated using these general criteria plus additional criteria tailored to each specific program as detailed in the Plan of Work under Outputs and State defined Outputs and Outcomes.

Annual evaluation will continue as before, looking at productivity in terms of immediate impact:
Referee journal articles and books

- Professional presentations
- General audience papers and news reports
- M.S. and PhD graduates
- Trends in terms of competitive funding
- And in terms of longer-term impact:
- Citations in scientific journals
- Patents
- Successful technology transfer or start-ups based on research programs
- Awards based on continuing impact and research excellence

Every five years there will be a full portfolio review including:

- Long term productivity
- Relevance to our constituent groups and the State and Region
- The allocation of research inputs among the programs
- Consideration of eliminating some research programs that are not productive or have diminished relevance given NIFA and State priorities
- Consideration of adding additional program areas given NIFA and State priorities

This portfolio review will be conducted internally by a committee appointed by the Dean and externally by a committee composed by a subset of our College Visiting Committee.

V(A). Planned Program (Summary)

Program # 2

1. Name of the Planned Program

Climate Change and Environmental Quality

2. Brief summary about Planned Program

Extension's Climate Change planned program works towards developing an agriculture system that maintains high productivity in the face of climate changes. It helps producers sustain economic vitality by taking advantage of emerging economic opportunities offered by climate change mitigation technologies.

Objectives addressed in this program area include:

- Decrease risk and loss to farming operations through use of risk mitigation tools and control of predation.
- Improve woodlot conditions and expand forest and non-timber product production.
- Improve the business and management competencies of forest/wood industry businesses.
- Increase compliance with knowledge of the WV Best Management Practices for controlling soil erosion and sedimentation from logging operations.
- Increase the capacity of local communities and landowners in nutrient management and sustainability.

At WVUES, activities were conducted under several categories, including composting and utilization, nutrient management, forestry, logging and milling, hay production, and grassland management. Topics included agricultural and cover crop, calibration methods and demonstration, WV GreenUp logging, forage economics, forage sampling and testing, nutrient management, grassland management, and risk mitigation.

Research conducted at the Experiment Station assists in the preservation of West Virginia's soil, water, forest, and wildlife resources. The focus of station research is on studying, protecting, and restoring environmental quality while developing economically effective and environmentally sustainable management practices for agriculture, forestry, mining, and rural communities and anticipating and adapting to climate change. Primary environmental research areas involve mine land restoration, soil science, ecosystem resiliency to climate change and other environmental stressors, water quality, wetlands, environmental economics and policy, and aquatic and terrestrial wildlife ecology.

At WV State University, extension and research programs are focused on initiatives to develop environmentally sound management techniques to stabilize storm-water run-off in residential and municipal settings, and developing environmentally sustainable production methods and practices for small-scale farmers and entrepreneurs. Investigating new crops and varieties, and new production methods, is key to farmers retaining and expanding their enterprises under changing climatic conditions. In addition, WV State University's extension program engages communities in green space creation and management through developing community gardens and parks, as well as training residents, local government members, and municipal employees on best practices in selection and management of trees in urban settings.

3. Program existence : Mature (More then five years)

4. Program duration : Long-Term (More than five years)

5. Expending formula funds or state-matching funds : Yes

6. Expending other than formula funds or state-matching funds : Yes

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
101	Appraisal of Soil Resources	0%	10%	15%	10%
102	Soil, Plant, Water, Nutrient Relationships	25%	15%	10%	5%
111	Conservation and Efficient Use of Water	0%	15%	0%	0%
112	Watershed Protection and Management	0%	0%	15%	0%
124	Urban Forestry	0%	10%	0%	0%
131	Alternative Uses of Land	25%	10%	0%	5%
132	Weather and Climate	0%	0%	10%	0%
133	Pollution Prevention and Mitigation	0%	0%	15%	0%
135	Aquatic and Terrestrial Wildlife	10%	0%	25%	0%
136	Conservation of Biological Diversity	20%	0%	0%	0%
211	Insects, Mites, and Other Arthropods Affecting Plants	5%	10%	0%	35%
212	Diseases and Nematodes Affecting Plants	0%	10%	0%	25%
403	Waste Disposal, Recycling, and Reuse	5%	10%	0%	20%
605	Natural Resource and Environmental Economics	10%	10%	10%	0%
	Total	100%	100%	100%	100%

V(C). Planned Program (Situation and Scope)

1. Situation and priorities

Research supporting preservation of West Virginia's soil, water, forest, and wildlife resources has high priority in the West Virginia Agricultural and Forestry Experiment Station. Key research themes will include anticipating and adapting to changes in climate, developing baseline data to monitor the impacts of climate change on State ecosystems, protecting soil and water quality by developing economically effective and environmentally sustainable management practices for agriculture and forestry and at other points of interaction between man and environment. Contamination of soil and eventually ground water with acid drainage from abandoned mines, and from more recent surface mining, is a persistent State

concern. Most acid mine drainage sites involve complex mixtures of contaminants.

Efforts to define the nature and scope of the contamination have used both actual mine drainage sites and simulated drainage situations. Examples of the former include comparing wetlands impacted by the release of metal-laden sediments from acid mine drainage and those not so impacted. Research with simulated mine drainage is measuring, under laboratory conditions, impacts of sulfate, neutralizing cation action and endpoint pH on acid mine drainage neutralization with the goal of designing more efficient acid mine drainage treatment systems. We plan to coordinate research and extension work on Marcellus shale, an area of growing economic and environmental importance in our region.

Research to develop environmentally sustainable practices for managing farms and forests is an important component of overall Research goals to position state producers/entrepreneurs to compete more effectively in organic or "green" markets and to preserve West Virginia land, forest, wildlife, and soil and water resources for future generations. Example projects include the development of soft chemical and mating disruption programs to minimize insect damage to tree fruit orchards, efforts to document and correct as necessary, impacts on non-target species from efforts to control gypsy moth defoliation of state forest lands, development of TMDL planning and assessment tools, use of composted poultry letter in turfgrass management, and developing methods to objectively assess economic value of environmentally sustainable practices.

West Virginia continues to deal with a changing ecological system due to the impacts of extractive industries and non-point sources of pollution. There is a great need throughout the state to develop management strategies based on scientific research that will ameliorate these conditions and repair environmental incurred as a part of these processes. Additionally, communities across the state continue to expand through urban sprawl which has the deleterious combined effect of decreasing forests, fields, and arable land while simultaneously increasing carbon emissions thorough commuting and additional storm water due to poor or mismanaged drainage.

2. Scope of the Program

- In-State Extension
- In-State Research
- Multistate Research
- Multistate Extension
- Integrated Research and Extension
- Multistate Integrated Research and Extension

V(D). Planned Program (Assumptions and Goals)

1. Assumptions made for the Program

Activities conducted without concern for the environmental consequences are rarely sustainable.

Research can lead to significant improvement in the sustainability of agricultural and forest industries in West Virginia and long-run, cost effective environmental decisions.

Climate change will have an impact on the environment of the State, affecting agricultural production, ecosystem health and the wellbeing of the citizens of the State.

Research can help mitigate the impacts of climate change and help our citizens respond in a positive way to climate change.

Demonstrating and mentoring are important components in climate change education.

Developing new varieties for production with improved pest resistance improves the management efficiency and hence profitability of farmers.

Funding can be identified and secured for the support of climate change programs.

The climate change programs are in-line with the direction being set by local, county, and state stakeholders.

There are numerous partners that can assist in the achievement of climate change programs.

Surface mined areas originally reclaimed for pasture and hay land post-mining land uses in Appalachia can be converted to forestland. The compacted soils and competitive ground cover must be mitigated before tree planting.

Forests play a crucial role in water quality issues.

West Virginia youth need to learn the issues related to climate control and be involved in its solutions.

2. Ultimate goal(s) of this Program

To make significant contributions to both the environmental sensitivity and profitability of land-based economic activities in West Virginia.

To help inform policy makers and citizens groups by providing scientific, unbiased information about climate change and environmental quality issues.

To assist rural and urban landowners, municipalities, and agri-business to utilize agricultural practices and systems that are sustainable, minimize impact on the environment.

To help producers plan for and make decisions to adapt to changing environments and sustain economic vitality and take advantage of emerging economic opportunities offered by climate change mitigation technologies.

To decrease risk and loss to farming operations through risk mitigation tools and control of predation, improve woodlot conditions, improve business and management competencies of forest/wood industry businesses.

To increase compliance with WV BMPs for controlling soil erosion and sedimentation, and increase capacity of local communities and landowners in nutrient management and sustainability.

V(E). Planned Program (Inputs)

1. Estimated Number of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890
2016	4.0	0.5	9.0	2.0
2017	4.0	0.5	9.0	2.0
2018	4.0	0.5	9.0	2.0
2019	4.0	0.5	9.0	2.0
2020	4.0	0.5	9.0	2.0

V(F). Planned Program (Activity)

1. Activity for the Program

Research stations will conduct research; publish/present results; contribute to educational and outreach programs; train graduate students.

Research stations will coordinate with Extension to provide relevant outreach programs.

Research stations will communicate with policy makers, community leaders and citizens groups.

WVSU researchers will investigate crop choices and scheduling, growing methods and economic returns on specialty crop production in high tunnels with several local growers as well as continue field trials. Results from this work will be used to deliver recommendations, schedules and enterprise budgets to existing and new growers in the state and region.

WVSU researchers will evaluate the expression of selected genes (microRNAs) on sweetpotato and pepper under changing environmental conditions using the Soil Plant and Atmosphere Research (SPAR) system.

To better understand the environmental and agronomic impact of co-product and spent materials (e.g. biochar, bentonite mud) on soil organic matter, WVSU researchers will determine their fate and effect on soil quality in laboratory greenhouse and field trials to develop best management practices for their beneficial use and contribution to agronomic outputs and carbon sequestration.

Extension educational activities will increase knowledge levels in alternative enterprises that may expand profits for small farm operations in open cropland and forested urban acreage. Topics will include: composting and utilization, nutrient management, agricultural and cover crop, calibration methods & demonstration, WV GreenUp logging, forage economics, forage sampling and testing, proper tree site and species selection, urban tree management, season Extension education, reainwater management, grassland management, risk mitigation. land judging and home site youth teams, CAFO training, invasive weed control using small ruminants, co-grazing goats and sheep with cattle, and 4-H youth climate control-related activities.

2. Type(s) of methods to be used to reach direct and indirect contacts

Extension

Direct Methods	Indirect Methods
● Education Class ● Workshop ● Group Discussion ● One-on-One Intervention ● Demonstrations	● Newsletters ● Web sites other than eXtension

3. Description of targeted audience

Target audiences include policy makers, planners, regulatory agencies and public interest and citizens groups, homeowners, land-owners, small-farm operators, volunteer organizations, various city, county and municipalities, state government, under-served and minority farmers/landowners, WVDA staff, USDA staff and other agricultural and natural resource focused agencies, undergraduate and graduate students, the bioenergy industry; private state and federal conservation and environmental quality groups and regulatory agencies, horizontal directional drilling professionals, private forestland owners, forestry professionals, researchers, and the general public.

V(G). Planned Program (Outputs)

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
  - Direct Adult Contacts
  - Indirect Adult Contacts
  - Direct Youth Contacts
  - Indirect Youth Contact
- Number of patents submitted
- Number of peer reviewed publications

☑ Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(H). State Defined Outputs

1. Output Measure

- Number of general press articles
- Number of educational materials create or updated
- Number of workshops and other educational presentations for clients
- Number of professional/academic presentations
- Number of graduate students earning degrees

☑ Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(I). State Defined Outcome

O. No	Outcome Name
1	Number of participants who increase their knowledge of management practices under climate variability and change.
2	Number of participants that adopt recommended adaptation and climate mitigation strategies for production agriculture and natural resources management.
3	Number of groups or organizations that change their procedures and/or policies regarding climate control.
4	Number of state landowners adopting reclamation and watershed protection practices in consultation with WVU and WV State Extension and Experiment Station Faculty.
5	Development of value-added products through pyrolysis process of biomass-to-energy conversion.
6	Creation of new knowledge in horizontal directional drilling mud co-product use and impact.

Outcome # 1

1. Outcome Target

Number of participants who increase their knowledge of management practices under climate variability and change.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 131 - Alternative Uses of Land
- 132 - Weather and Climate
- 133 - Pollution Prevention and Mitigation
- 135 - Aquatic and Terrestrial Wildlife
- 136 - Conservation of Biological Diversity
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Diseases and Nematodes Affecting Plants
- 403 - Waste Disposal, Recycling, and Reuse
- 605 - Natural Resource and Environmental Economics

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension
- 1890 Research

Outcome # 2

1. Outcome Target

Number of participants that adopt recommended adaptation and climate mitigation strategies for production agriculture and natural resources management.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water

- 112 - Watershed Protection and Management
- 131 - Alternative Uses of Land
- 132 - Weather and Climate
- 133 - Pollution Prevention and Mitigation
- 135 - Aquatic and Terrestrial Wildlife
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Diseases and Nematodes Affecting Plants
- 403 - Waste Disposal, Recycling, and Reuse
- 605 - Natural Resource and Environmental Economics

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension
- 1890 Research

Outcome # 3

1. Outcome Target

Number of groups or organizations that change their procedures and/or policies regarding climate control.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 131 - Alternative Uses of Land
- 132 - Weather and Climate
- 133 - Pollution Prevention and Mitigation
- 135 - Aquatic and Terrestrial Wildlife
- 403 - Waste Disposal, Recycling, and Reuse
- 605 - Natural Resource and Environmental Economics

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension

- 1890 Research

Outcome # 4

1. Outcome Target

Number of state landowners adopting reclamation and watershed protection practices in consultation with WVU and WV State Extension and Experiment Station Faculty.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 131 - Alternative Uses of Land
- 132 - Weather and Climate
- 133 - Pollution Prevention and Mitigation
- 135 - Aquatic and Terrestrial Wildlife
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Diseases and Nematodes Affecting Plants
- 403 - Waste Disposal, Recycling, and Reuse
- 605 - Natural Resource and Environmental Economics

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension
- 1890 Research

Outcome # 5

1. Outcome Target

Development of value-added products through pyrolysis process of biomass-to-energy conversion.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 131 - Alternative Uses of Land
- 133 - Pollution Prevention and Mitigation
- 403 - Waste Disposal, Recycling, and Reuse

- 605 - Natural Resource and Environmental Economics

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Research

Outcome # 6

1. Outcome Target

Creation of new knowledge in horizontal directional drilling mud co-product use and impact.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 101 - Appraisal of Soil Resources
- 112 - Watershed Protection and Management
- 131 - Alternative Uses of Land
- 133 - Pollution Prevention and Mitigation
- 403 - Waste Disposal, Recycling, and Reuse
- 605 - Natural Resource and Environmental Economics

4. Associated Institute Type(s)

- 1890 Extension
- 1890 Research

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges

Description

{NO DATA ENTERED}

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

Experiment Station research program evaluation will take place at two levels and on two different time cycles. All programs will be evaluated using these general criteria plus additional criteria tailored to each specific program as detailed in the Plan of Work under Outputs and State defined Outputs and Outcomes.

Annual evaluation will continue as before, looking at productivity in terms of immediate impact:

- Referee journal articles and books
- Professional presentations
- General audience papers and news reports
- M.S. and PhD graduates
- Trends in terms of competitive funding
- And in terms of longer-term impact:
- Citations in scientific journals
- Patents
- Successful technology transfer or start-ups based on research programs
- Awards based on continuing impact and research excellence

Every five years there will be a full portfolio review including:

- Long term productivity
- Relevance to our constituent groups and the State and Region
- The allocation of research inputs among the programs
- Consideration of eliminating some research programs that are not productive or have diminished relevance given NIFA and State priorities
- Consideration of adding additional program areas given NIFA and State priorities

This portfolio review will be conducted internally by a committee appointed by the Dean and externally by a committee composed by a subset of our College Visiting Committee.

Standard educational evaluations of participants in programs will be conducted. Evaluation of knowledge and skill gained within the climate control area will utilize paper and online surveys of knowledge and skill gains as well as benefits of educational programs. Evaluation studies include measuring the effectiveness of BMPs related to the production of well -fermented baleage.

V(A). Planned Program (Summary)

Program # 3

1. Name of the Planned Program

Sustainable Energy

2. Brief summary about Planned Program

The Sustainable Energy planned program at WVU Extension works toward energy independence to develop biomass use for biofuels by designing optimum forestry and crops for bioenergy production. It also works towards improving wood lot conditions and expanding forest and non-timber product production in general.

WVU Extension's educational topics include reclamation of Marcellus well sites, chestnut reforestation, switchgrass potential for mine soils, chestnut growth on surface mines, bioenergy crops on surface mines, flow effects on acidity, survival of chestnut trees, biomass for bioenergy, switchgrass biomass stewardship, and biomass issues for forest management plans.

At the WVU Experiment Station, the primary focus is on biofuel and bioenergy production, including feedstock development and logistics, processing and conversion technologies, electricity and transportation fuel production and life cycle analysis. The focus of this program is on the development and analysis of sustainable systems for energy production from renewable, bio-based feedstocks. Analysis includes economic assessment, environmental impact determination and public policy evaluation; all measured relative to conventional energy production systems. Systems "development" will include designing methods for cost efficient production of renewable biofuels from agricultural and forest/wood product waste materials, from dedicated production of crops such as algae, grasses and rapid-growth trees, and from the co-processing of fossil and renewable energy sources.

Sustainable energy research at WV State University is focused on using anaerobic digestion and its associated microbial communities to convert agricultural wastes into bioenergy and biofuels, as well as evaluating the energy density of crop biomass for sustainable production of bioenergy. WV State University research is also exploring soil restoration and mine site reclamation strategies using digester effluent, microbial biogeochemical analyses, and biochar from biomass pyrolysis. Several potential biomass species are being evaluated via breeding and genome analysis on reclamation sites. A new research thrust is to evaluate energy rich biomass crops using biodiesel production for alternative marketable application to reduce greenhouse gas production from fossil fuels in conventional power plants.

3. Program existence : Intermediate (One to five years)

4. Program duration : Long-Term (More than five years)

5. Expending formula funds or state-matching funds : Yes

6. Expending other than formula funds or state-matching funds : Yes

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
101	Appraisal of Soil Resources	0%	0%	0%	10%
102	Soil, Plant, Water, Nutrient Relationships	0%	0%	0%	10%
123	Management and Sustainability of Forest Resources	0%	0%	0%	10%
131	Alternative Uses of Land	40%	0%	10%	0%
133	Pollution Prevention and Mitigation	0%	0%	10%	0%
201	Plant Genome, Genetics, and Genetic Mechanisms	0%	0%	0%	20%
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants	0%	0%	0%	10%
403	Waste Disposal, Recycling, and Reuse	50%	50%	20%	20%
511	New and Improved Non-Food Products and Processes	0%	50%	35%	20%
605	Natural Resource and Environmental Economics	0%	0%	15%	0%
610	Domestic Policy Analysis	0%	0%	10%	0%
806	Youth Development	10%	0%	0%	0%
	Total	100%	100%	100%	100%

V(C). Planned Program (Situation and Scope)

1. Situation and priorities

The U.S. has set an energy policy target of producing 20 percent of its transportation fuels from renewable sources by 2030. In order to meet that standard it will be necessary to develop ways of utilizing biomass, including residual biomass from agriculture and forestry, to produce that fuel. This target represents a significant challenge to the Land Grant University System.

Faculty at the West Virginia Experiment Station have a significant history of research related to the production and use of energy derived both from conventional fossil fuels (primarily coal) and, more recently from renewable feedstocks. Areas of research related to fossil fuel sources have focused on production efficiency and safety, environmental impact of production (soil and water quality, impact on wildlife habitat, etc.), and public policy issues related to energy harvest and use. Areas of research related to renewable feedstocks include developing systems for the dedicated production of biomass for energy production, and for using bio-materials currently discarded in agricultural production, timber harvest, and wood product manufacturing. West Virginia has access to large quantities of cellulosic waste and woody biomass as well as to a significant quantity of land better suited to the production of energy feedstock (grasses, rapidly growing trees, etc.) than to producing conventional agricultural commodities.

Agricultural, municipal and industrial processes produce large quantities of organic wastes that have

significant economic and environmental impact on surrounding municipal and rural communities. However, this waste represents a resource that can be utilized for bioenergy production and building a bioeconomy. Anaerobic digesters are under-utilized and WVSU studies will further demonstrate the benefits and applications of this technology. An important limitation of the process is its sensitivity to disturbances such as variations in temperature and feed (composition and overloading) which can cause digester failure. WVSU research addresses these limitations and seeks to engineer more robust, efficient digesters and bioenergy production.

Surface mining in the Appalachian region adversely impacts ecosystem services provided by soils. Research will be done at WVSU to evaluate whether microbial biogeochemical processes in soils are restored through current reclamation strategies.

Organic wastes and byproducts can prove to be cost-effective components for reducing adverse impacts of pollution and extractive industries and help in restoring soil quality in impacted lands. Biochar and anaerobic digester products, as well as other waste-streams are of potential agronomic use and benefits in improving productivity and ecological services of the regional acid weathered soils.

In nature plant oils represents one of the most energy-rich sources of renewable fuels, these oils stored in the form of triacylglycerols that can be transformed into biodiesel. Enhancement of energy density in crops can be achieved by synthesizing and accumulating oils in the biomass. After extraction of oils liganocellulosic feedstock remains behind can be used in microbial processes. An alternative and quickly marketable application of energy rich biomass crops is in biodiesel production/ co-firing in conventional power plants to reduce greenhouse gases from fossil fuels.

2. Scope of the Program

- In-State Extension
- In-State Research
- Multistate Research
- Multistate Extension
- Integrated Research and Extension
- Multistate Integrated Research and Extension

V(D). Planned Program (Assumptions and Goals)

1. Assumptions made for the Program

Reducing dependence on foreign sources of energy derived from fossil fuels, while developing renewable, more environmentally friendly, domestic sources will continue to be in the national interest and will remain a research priority for the future.

The Land Grant System is particularly situated to contribute solutions to our country's energy problems.

The microbial ecology of digesters is critically important for stable, efficient operation, but is usually under-appreciated when developing and operating digester systems.

Understanding the microbial processes will allow greater control and optimization of anaerobic

digestion and microbial energy conversion.

Anaerobic digestion can benefit poultry farms (and other animal farms) and help to improve the economy of West Virginia and the Appalachian region.

Lessons learned from the microbial energy conversion processes in digesters can be transferred to other microbial bioenergy-producing processes.

Selected energy industry waste streams can be beneficially used as soil amendment, reducing disposal costs and improving soil productivity.

Local, state, and federal groups and agencies may be able to use the findings of this research to improve production levels on marginal lands.

The effectiveness of current mine site soil reclamation strategies can be evaluated in terms of the restoration of microbial biogeochemical processes using new molecular methods.

Understanding the metabolism mechanisms and regulation in oil biosynthesis in photosynthetic organisms will allow engineering of oils/ drop-in fuels in biomass crops.

West Virginia is well-suited to supply forestry wastes for ethanol production and to grow energy crops such as switchgrass on marginally productive lands. The state also has tens of thousands of acres of reclaimed surface mine sites which are well-suited for production of energy crops.

West Virginia is the nation's second largest coal-producing and third most heavily forested state in the nation. Opportunities exist for the co-development of biomass and coal energy which combine the sustainable qualities of woody biomass and the fuel density of West Virginia coal."

2. Ultimate goal(s) of this Program

To make significant contributions through research and outreach to the efficiency and sustainability of energy production and use in the State of West Virginia and the Nation.

To improve energy independence for West Virginia through the enhancement of technologies related to timber and non-timber production.

To create a more stable and efficient digester for the conversion of organic waste to bioenergy.
To increase adoption of anaerobic digestion technology among farmers and industries that produce organic waste.

To evaluate the use of biochar and anaerobic digester products as soil amendments to improve regional soils productivity in agronomically beneficially and environmentally sound way.

To improved mine site soil reclamation practices that enhance recovery of essential microbial processes.

To develop and evaluate use of energy industry co-products as soil amendments to improve productivity of marginal lands.

V(E). Planned Program (Inputs)

1. Estimated Number of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890
2016	1.0	0.0	3.0	4.5
2017	1.0	0.0	3.0	4.5
2018	1.0	0.0	3.0	4.5
2019	1.0	0.0	3.0	4.5
2020	1.0	0.0	3.0	4.5

V(F). Planned Program (Activity)

1. Activity for the Program

Researchers at WVU and WVSU will take a number of approaches regarding the development of renewable sources of energy, including feedstock production, feedstock logistics, research in pre-processing and conversion technologies, development of liquid and solid sources of energy, and life-cycle analysis.

Researchers will publish their research in scientific journals, make presentations at professional meetings, and in conjunction with WVU Extension, develop and transfer scalable technologies to State industries.

WVSU researchers will study the functional role of additional oil biosynthesis genes in Arabidopsis and translate the proven examples from the model plant to the dedicated bioenergy crop, for the production of bioenergy.

WVSU researchers will continue to focus on anaerobic digestion and the engineering of anaerobic microbial biomass conversion processes, including the feasibility of co-digesting poultry farm waste and glycerol, and to investigate ways to increase the production of carboxylates (short chain fatty acids) in thermophilic digesters.

WVSU researchers are evaluating whether soil microbial processes are recovering across a set of West Virginia mine reclamation sites that span 20 years of post-mining recovery.

WVSU researchers will model the effect of spent bentonite mud on soil properties across soil texture using observations from the ten different sites. Understanding impact and effect will lead to development of best management practices for the use of the spent material.

At WVUES, educational programs for the community will focus on the reclamation of Marcellus well sites.

At the WVU Experiment Station this program focuses on biofuel and bioenergy production. The program so far is focused on examining different biomass feedstocks for the production of biofuels (ethanol, biodiesel, syngas) and biomaterials, nondestructive methods for characterizing the physical and chemical properties of lingo-cellulosic biomass, and syngas production from co-firing coal and biomass. The feedstocks examined so far include algae, switchgrass and mixed grasses, and residual woody biomass from forestry operations.

2. Type(s) of methods to be used to reach direct and indirect contacts

Extension

Direct Methods	Indirect Methods
● Education Class ● Workshop ● Group Discussion ● One-on-One Intervention ● Demonstrations	● Newsletters ● Web sites other than eXtension

3. Description of targeted audience

The target audience for this program area includes the bio-fuels and materials industries, the electricity generating industry, foresters, digester manufacturers and users, poultry farmers, other agricultural waste producers, environmentally concerned citizens, undergraduate and graduate students, engineers and scientists who study bioreactors and anaerobic microbial processes, mine operators, mine reclamation contractors, land owners, farmers, related energy industry sector, environmental scientists and engineers, small and large scale commercial biotech and chemical companies and local coal power companies researchers, regulators, policy makers.

V(G). Planned Program (Outputs)

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
  - Direct Adult Contacts
  - Indirect Adult Contacts
  - Direct Youth Contacts
  - Indirect Youth Contact
- Number of patents submitted
- Number of peer reviewed publications

☑ Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(H). State Defined Outputs

1. Output Measure

- Number of general press articles
- Number of educational materials create or updated
- Number of workshops and other educational presentations for clients
- Number of professional/academic presentations
- Number of graduate students earning degrees

☑ Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(I). State Defined Outcome

O. No	Outcome Name
1	Number of participants who increase awareness of beneficial use of waste and byproducts to improve soil productivity and ecological services.
2	Number of stakeholders participating in production/harvesting/storage systems that increase or improve their skills.
3	Number of youth who gain science process skills in biofuels.
4	Number of participants who adopt BMPs for production/harvesting/storage systems.
5	Number of new processes for converting lignocellulose to usable sources of energy.
6	Increase in the percentage of renewable sources of biomass co-fired with coal (% increase per year).
7	Number of improvements to the operational parameters that have been used to control thermophillic poultry waste digesters.
8	Creation of new knowledge concerning how microbial diversity gives rise to anaerobic microbial energy conversion and anaerobic digestion.
9	Improve the energy density of plants for sustainable production of bioenergy
10	New knowledge concerning the effectiveness of current mine site reclamation methods for restoring soil microbial processes

Outcome # 1

1. Outcome Target

Number of participants who increase awareness of beneficial use of waste and byproducts to improve soil productivity and ecological services.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 123 - Management and Sustainability of Forest Resources
- 131 - Alternative Uses of Land
- 133 - Pollution Prevention and Mitigation
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 403 - Waste Disposal, Recycling, and Reuse
- 605 - Natural Resource and Environmental Economics
- 610 - Domestic Policy Analysis
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension
- 1890 Research

Outcome # 2

1. Outcome Target

Number of stakeholders participating in production/harvesting/storage systems that increase or improve their skills.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 123 - Management and Sustainability of Forest Resources
- 131 - Alternative Uses of Land
- 133 - Pollution Prevention and Mitigation
- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 403 - Waste Disposal, Recycling, and Reuse

- 605 - Natural Resource and Environmental Economics
- 610 - Domestic Policy Analysis
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension
- 1890 Research

Outcome # 3

1. Outcome Target

Number of youth who gain science process skills in biofuels.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 131 - Alternative Uses of Land
- 133 - Pollution Prevention and Mitigation
- 403 - Waste Disposal, Recycling, and Reuse
- 511 - New and Improved Non-Food Products and Processes
- 605 - Natural Resource and Environmental Economics
- 610 - Domestic Policy Analysis
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension
- 1890 Research

Outcome # 4

1. Outcome Target

Number of participants who adopt BMPs for production/harvesting/storage systems.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 123 - Management and Sustainability of Forest Resources
- 131 - Alternative Uses of Land
- 133 - Pollution Prevention and Mitigation
- 403 - Waste Disposal, Recycling, and Reuse
- 511 - New and Improved Non-Food Products and Processes
- 605 - Natural Resource and Environmental Economics
- 610 - Domestic Policy Analysis
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension
- 1890 Research

Outcome # 5

1. Outcome Target

Number of new processes for converting lignocellulose to usable sources of energy.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 131 - Alternative Uses of Land
- 133 - Pollution Prevention and Mitigation
- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 403 - Waste Disposal, Recycling, and Reuse
- 511 - New and Improved Non-Food Products and Processes
- 605 - Natural Resource and Environmental Economics
- 610 - Domestic Policy Analysis
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension

- 1890 Research

Outcome # 6

1. Outcome Target

Increase in the percentage of renewable sources of biomass co-fired with coal (% increase per year).

2. Outcome Type : Change in Condition Outcome Measure

3. Associated Knowledge Area(s)

- 131 - Alternative Uses of Land
- 133 - Pollution Prevention and Mitigation
- 403 - Waste Disposal, Recycling, and Reuse
- 511 - New and Improved Non-Food Products and Processes
- 605 - Natural Resource and Environmental Economics
- 610 - Domestic Policy Analysis
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension
- 1890 Research

Outcome # 7

1. Outcome Target

Number of improvements to the operational parameters that have been used to control thermophillic poultry waste digesters.

2. Outcome Type : Change in Condition Outcome Measure

3. Associated Knowledge Area(s)

- 131 - Alternative Uses of Land
- 133 - Pollution Prevention and Mitigation
- 403 - Waste Disposal, Recycling, and Reuse
- 511 - New and Improved Non-Food Products and Processes
- 605 - Natural Resource and Environmental Economics

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension
- 1890 Research

Outcome # 8

1. Outcome Target

Creation of new knowledge concerning how microbial diversity gives rise to anaerobic microbial energy conversion and anaerobic digestion.

2. Outcome Type : Change in Condition Outcome Measure

3. Associated Knowledge Area(s)

- 131 - Alternative Uses of Land
- 133 - Pollution Prevention and Mitigation
- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 403 - Waste Disposal, Recycling, and Reuse
- 511 - New and Improved Non-Food Products and Processes
- 605 - Natural Resource and Environmental Economics
- 610 - Domestic Policy Analysis
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension
- 1890 Research

Outcome # 9

1. Outcome Target

Improve the energy density of plants for sustainable production of bioenergy

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 102 - Soil, Plant, Water, Nutrient Relationships
- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants

4. Associated Institute Type(s)

- 1890 Research

Outcome # 10

1. Outcome Target

New knowledge concerning the effectiveness of current mine site reclamation methods for restoring soil microbial processes

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 131 - Alternative Uses of Land
- 201 - Plant Genome, Genetics, and Genetic Mechanisms

4. Associated Institute Type(s)

- 1890 Research

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges

Description

{NO DATA ENTERED}

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

Experiment Station research program evaluation will take place at two levels and on two different time cycles. All programs will be evaluated using these general criteria plus additional criteria tailored to each specific program as detailed in the Plan of Work under Outputs and State defined Outputs and Outcomes.

Annual evaluation will continue as before, looking at productivity in terms of immediate impact:

- Referee journal articles and books
- Professional presentations
- General audience papers and news reports
- M.S. and PhD graduates
- Trends in terms of competitive funding
- And in terms of longer-term impact:
- Citations in scientific journals
- Patents
- Successful technology transfer or start-ups based on research programs
- Awards based on continuing impact and research excellence

Every five years there will be a full portfolio review including:

- Long term productivity
- Relevance to our constituent groups and the State and Region
- The allocation of research inputs among the programs
- Consideration of eliminating some research programs that are not productive or have diminished relevance given NIFA and State priorities
- Consideration of adding additional program areas given NIFA and State priorities

This portfolio review will be conducted internally by a committee appointed by the Dean and externally by a committee composed by a subset of our College Visiting Committee.

Standard educational evaluations of participants in programs will be conducted.

V(A). Planned Program (Summary)

Program # 4

1. Name of the Planned Program

Childhood Obesity, Nutrition and Health

2. Brief summary about Planned Program

West Virginia citizens are tied with the citizens of Mississippi in having the highest level of obesity in the nation (Center for Disease Control, 2013). West Virginia is also above the national averages for incidence of diabetes, high blood pressure, and cardiovascular disease, as well as for osteopenia and osteoporosis. WV has the highest rate of senior population in the US and the second highest rate of sedentary adults. According to "America's Health: State Health Rankings," West Virginia has had one of the worst total mortality rate among states for several years. Huntington, WV was named the nation's most obese city in a 2008 study. These factors, combined with the lack of access to grocery stores in rural areas and the increased number of meals consumed away from home, contribute to the pressing need for healthy living education and research.

Access to quality nutrition and health education programs is limited to many West Virginians due to the rural nature of the state, insufficient public transportation, lack of insurance reimbursement, and the limited availability of such programs. The 2010 CDC report cites a need for better youth health education to address problems related to childhood obesity in West Virginia. The Family Nutrition Program (SNAP and EFNEP) has filled in the gap and has multiple stakeholders at the state and federal levels. It is also a priority of these programs to educate the parents and caregivers of youth in order to assist them in making healthier decisions for our children.

Knowledge regarding relationships among familial factors, dietary patterns and body mass index of young children, will allow us to better address the serious and growing problem of childhood obesity in West Virginia. Planned research will provide information about these relationships in rural, Appalachian children that will allow us to design culturally sensitive, effective outreach and education programs.

State median population age and occurrence of osteopenia or osteoporosis likewise exceed national averages in West Virginia. In fact, the National Osteoporosis Foundation estimates that by the year 2020, more than 300,000 women in West Virginia will suffer from osteoporosis unless corrective action is taken. Ongoing research is examining the efficacy of exercise and treatment with non-steroidal plant estrogens (phytoestrogens) as an alternative to estrogen replacement therapy in preventing bone loss.

Omega-3 polyunsaturated fatty acids, particularly docosahexaenoic acid (DHA) have been shown to reduce cardiovascular disease, inflammatory disorders, autoimmune disorders, Crohn's disease and certain cancers. Research will be undertaken to develop sensory-acceptable methods of fortifying foods with DHA which avoid problems of short chain fatty acid oxidation, and of providing a reliable source of DHA using the heterotrophic marine alga, Crypthecodinium cohnii.

The following activities are planned to address this priority area:

Nutrition, Food Selection, and Preparation - The largest program in this category is the Family Nutrition Program for both low-come adults and youths. The program teaches food and nutrition by using the USDA's My Plate. Other activities in this category include nutrition classes, food preparation classes, and classes on food selection/shopping resources and techniques.

Healthy Lifestyles Skills and Practice- The largest programs in this category include the Health Motivator

Program, the Summer Steps program, Choose to Change Project, Family Nutrition Program Dental Tips for Parents, Love Your Heart, Health Rocks, and ATV Safety. The Choose to Change Project is a collaborative program with two school systems and WVU's Davis College, School of Medicine, and Regional Research Institute).

Chronic Diseases and Associated Risk Factors- Two initiatives, Dining with Diabetes, a cooking school for persons with diabetes and their caregivers and the Diabetes Symposium, a national professional conference enhance the capacity of Extension educators and healthcare partners to impart diabetes education and prevention initiatives. Other initiatives address heart disease prevention such as Women's Heart Health and the CARDIAC program: Coronary Artery Risk Detection in Appalachian Communities

At WVSU, the research program plans to add a position in the area of childhood obesity to complement and integrate with the existing Extension program as funding allows in future years.

3. Program existence : Mature (More then five years)

4. Program duration : Long-Term (More than five years)

5. Expending formula funds or state-matching funds : Yes

6. Expending other than formula funds or state-matching funds : Yes

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
501	New and Improved Food Processing Technologies	0%	0%	15%	0%
502	New and Improved Food Products	0%	0%	15%	0%
701	Nutrient Composition of Food	0%	30%	0%	0%
702	Requirements and Function of Nutrients and Other Food Components	10%	0%	20%	0%
703	Nutrition Education and Behavior	30%	10%	30%	30%
724	Healthy Lifestyle	30%	20%	20%	20%
801	Individual and Family Resource Management	10%	0%	0%	0%
802	Human Development and Family Well-Being	10%	20%	0%	30%
806	Youth Development	10%	20%	0%	20%
	Total	100%	100%	100%	100%

V(C). Planned Program (Situation and Scope)

1. Situation and priorities

West Virginia citizens are tied with Mississippi in having the highest level of obesity in the nation (Center for Disease Control, 2013). West Virginia is also above the national averages for incidence of

diabetes, high blood pressure, and cardiovascular disease, as well as for osteopenia and osteoporosis. WV has the highest rate of senior population in the US and the second highest rate of sedentary adults. According to "America's Health: State Health Rankings," West Virginia has had one of the worst total mortality rate among states for several years. Huntington, WV was named the nation's most obese city in a 2008 study. These factors, combined with the lack of access to grocery stores in rural areas and the increased number of meals consumed away from home, contribute to the pressing need for healthy living education and research.

Access to quality nutrition and health education programs is limited to many West Virginians due to the rural nature of the state, insufficient public transportation, lack of insurance reimbursement, and the limited availability of such programs. The 2010 CDC report cites a need for better youth health education to address problems related to childhood obesity in West Virginia. The Family Nutrition Program (SNAP and EFNEP) has filled in the gap and has multiple stakeholders at the state and federal levels. It is also a priority of these programs to educate the parents and caregivers of youth in order to assist them in making healthier decisions for our children.

Knowledge regarding relationships among familial factors, dietary patterns and body mass index of young children, will allow us to better address the serious and growing problem of childhood obesity in West Virginia. Planned research will provide information about these relationships in rural, Appalachian children that will allow us to design culturally sensitive, effective outreach and education programs.

State median population age and occurrence of osteopenia or osteoporosis likewise exceed national averages in West Virginia. In fact, the National Osteoporosis Foundation estimates that by the year 2020, more than 300,000 women in West Virginia will suffer from osteoporosis unless corrective action is taken. Ongoing research is examining the efficacy of exercise and treatment with non-steroidal plant estrogens (phytoestrogens) as an alternative to estrogen replacement therapy in preventing bone loss.

Omega-3 polyunsaturated fatty acids, particularly docosahexaenoic acid (DHA) have been shown to reduce cardiovascular disease, inflammatory disorders, autoimmune disorders, Crohn's disease and certain cancers. Research will be undertaken to develop sensory-acceptable methods of fortifying foods with DHA which avoid problems of short chain fatty acid oxidation, and of providing a reliable source of DHA using the heterotrophic marine alga, Crypthecodinium cohnii.

At WVSU, the research program plans to add a position in the area of childhood obesity to complement and integrate with the existing Extension program as funding allows in future years.

2. Scope of the Program

- In-State Extension
- In-State Research
- Multistate Research
- Multistate Extension
- Integrated Research and Extension
- Multistate Integrated Research and Extension

V(D). Planned Program (Assumptions and Goals)

1. Assumptions made for the Program

The state of WV falls well below the national average for active lifestyle practices or family resource management tools being prevalent throughout the counties or local communities.

There are many people that suffer from inefficient opportunities or knowledge in gaining more productive skill sets related to nutrition.

Traditionally, the county Extension office is regarded as a safe and appropriate place for nutrition and healthy lifestyle information. Serving as community resource will effectively provide opportunities to develop healthier practices in the home.

Childhood obesity can best be prevented by using a family, community approach that includes county agents working directly with citizens and working with community coalitions. An example of this is the Family Nutrition Program (EFNEP and SNAP-Ed) which uses paraprofessionals to provide a community-based approach of reaching low-income families and helping them to change their behaviors.

Research has shown that community coalitions can empower people to make healthy lifestyle changes, which can reduce the prevalence of complications from chronic diseases such as diabetes and improve the health of people with diabetes. Community sites can provide seniors with a safe, secure place to exercise and form health.

Good nutrition and optimal food consumption is fundamental to overall health. Dietary modifications can be developed which will significantly improve the health of West Virginia citizens. Research can lead to increased food quality and safety while increasing efficiency of food processing.

Funding priorities are becoming more prevalent in the areas of healthy lifestyle and promotion of a better food management system.

2. Ultimate goal(s) of this Program

To provide citizens of West Virginia with an abundant, safe, high quality food supply and the information needed to make healthful dietary choices.

To produce research that leads to a better understanding of the role of nutrition in human health and the informational, economic and environmental factors that govern consumer choice.

To increase the capacity of youth, adults and families to make informed, science-based decisions which prevent chronic disease and maintain healthy weight status through physical activity and intake of nutrient-dense foods.

To increase knowledge and skills in healthy eating, chronic disease (diabetes, heart disease, cancer, obesity, and others) and associated risk factors, and physical activities.

To increase physical activity or decrease the amount of sedentary time, improving targeted eating behaviors, and complying with health provider guidelines.

To create new policies and collaborative programs to improve access to healthier foods. Healthy lifestyle education will improve because of applied research projects.

V(E). Planned Program (Inputs)

1. Estimated Number of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890
2016	16.0	4.0	4.0	0.0
2017	16.0	4.0	4.0	0.0
2018	16.0	4.0	4.0	0.0
2019	16.0	4.0	4.0	0.0
2020	16.0	4.0	4.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

WV Extension and Research will ensure that youths, adults and families make informed, science-based decisions which prevent chronic disease and maintain healthy weight status through physical activity and intake of nutrient-dense foods. Extension will primarily be involved in local and regional efforts to train citizens in healthy living skills and to increase collaboration with other universities, agencies and organizations.

WVUES units and program teams will conduct the following programs: the 4-H Health Initiative, the Adult and Youth Family Nutrition Program (EFNP and SNAP- ED), Dining with Diabetes and the Diabetes Symposium, the National Diabetes Prevention Program, Health Rocks, Wild Wonderful Wellness, CARDIAC, Women's Heart Health, Early Childhood Obesity Prevention, Energy Express, Strong Families Eat Together, and Farmers Markets.

On-line educational programs, seminars, workshops, food demonstrations, fact sheets, social media, curricula and individual consultations will be used to educate WV citizens, nutrition and health professionals, and extension faculty members.

Training programs will be developed to improve nutrition, chronic disease management, health behaviors such as physical activity, and collaborations.

The WVSU Extension Service will target the aspects of personal behavior and environmental barriers that hinder personal healthy lifestyles. Youth will be educated on proper serving sizes, healthy food selection and preparation, and monitoring intake. WVSU Extension Service will work with partners to revitalize community parks and greenspace and conduct walkability and bikeability audits to ensure safe access to and from the parks. WVSU Extension Service faculty and staff will instruct lessons about kitchen and food safety, food preparation, healthy food selection, economical ways to practice health and nutrition, and engage in physical activities.

The Research units will conduct research; publish results in scientific, peer reviewed research journals and popular press; make presentations to colleagues at professional meetings; train graduate students. Deliver information and offer educational workshops on nutrition, health and diet. Work with educators and youth programs in conjunction with WVU Extension to encourage improved nutrition in children and to reduce childhood obesity in the State.

2. Type(s) of methods to be used to reach direct and indirect contacts

Extension

Direct Methods	Indirect Methods
● Education Class ● Workshop ● Group Discussion ● One-on-One Intervention ● Demonstrations	● Newsletters ● Web sites other than eXtension

3. Description of targeted audience

The target audience for this program area includes dieticians, nutritionists, health care professionals, policy makers, researchers, Extension educators, 4-H and other youth program developers, community leaders, low-income West Virginia adults and youth, West Virginians who have diabetes and their caregivers, and older adults and their caregivers.

V(G). Planned Program (Outputs)

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
  - Direct Adult Contacts
  - Indirect Adult Contacts
  - Direct Youth Contacts
  - Indirect Youth Contact
- Number of patents submitted
- Number of peer reviewed publications

☐ Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(H). State Defined Outputs

1. Output Measure

- Number of general press articles
- Number of educational materials create or updated
- Number of workshops and other educational presentations for clients
- Number of professional/academic presentations
- Number of graduate students earning degrees

☐ Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(I). State Defined Outcome

O. No	Outcome Name
1	Number of youth who gained awareness and knowledge about eating more healthy foods.
2	Number of adults/families who gained awareness and knowledge about eating more healthy foods.
3	Number of youth who gained awareness and knowledge becoming more active.
4	Number of adults/families who gained awareness and knowledge about becoming more active
5	Number of participants that gained knowledge of how to access and produce healthy foods.
6	Number of youth who change a behavior or use a new skill related to nutrition and health such as choosing healthier foods and increasing physical exercise.
7	Number of adults/families who change a behavior or use a new skill related to nutrition and health such as choosing healthier foods and increasing physical.
8	Number of participants who train others to eat more healthy foods and/or become more active.
9	Number of delivery systems/access points that change their procedures and/or policies with regard to expanding or improving their offering healthy foods or healthy activities.
10	Number of participants who advance to higher knowledge and skill level in healthy lifestyle professional areas.

Outcome # 1

1. Outcome Target

Number of youth who gained awareness and knowledge about eating more healthy foods.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 701 - Nutrient Composition of Food
- 702 - Requirements and Function of Nutrients and Other Food Components
- 703 - Nutrition Education and Behavior
- 724 - Healthy Lifestyle
- 801 - Individual and Family Resource Management
- 802 - Human Development and Family Well-Being
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension
- 1890 Research

Outcome # 2

1. Outcome Target

Number of adults/families who gained awareness and knowledge about eating more healthy foods.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 701 - Nutrient Composition of Food
- 702 - Requirements and Function of Nutrients and Other Food Components
- 703 - Nutrition Education and Behavior
- 724 - Healthy Lifestyle
- 801 - Individual and Family Resource Management
- 802 - Human Development and Family Well-Being
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension
- 1890 Research

Outcome # 3

1. Outcome Target

Number of youth who gained awareness and knowledge becoming more active.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 701 - Nutrient Composition of Food
- 702 - Requirements and Function of Nutrients and Other Food Components
- 703 - Nutrition Education and Behavior
- 724 - Healthy Lifestyle
- 801 - Individual and Family Resource Management
- 802 - Human Development and Family Well-Being
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension
- 1890 Research

Outcome # 4

1. Outcome Target

Number of adults/families who gained awareness and knowledge about becoming more active

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 701 - Nutrient Composition of Food
- 702 - Requirements and Function of Nutrients and Other Food Components
- 703 - Nutrition Education and Behavior

- 724 - Healthy Lifestyle
- 801 - Individual and Family Resource Management
- 802 - Human Development and Family Well-Being
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension
- 1890 Research

Outcome # 5

1. Outcome Target

Number of participants that gained knowledge of how to access and produce healthy foods.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 701 - Nutrient Composition of Food
- 702 - Requirements and Function of Nutrients and Other Food Components
- 703 - Nutrition Education and Behavior
- 724 - Healthy Lifestyle
- 801 - Individual and Family Resource Management
- 802 - Human Development and Family Well-Being
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension
- 1890 Research

Outcome # 6

1. Outcome Target

Number of youth who change a behavior or use a new skill related to nutrition and health such as choosing healthier foods and increasing physical exercise.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 701 - Nutrient Composition of Food
- 702 - Requirements and Function of Nutrients and Other Food Components
- 703 - Nutrition Education and Behavior
- 724 - Healthy Lifestyle
- 801 - Individual and Family Resource Management
- 802 - Human Development and Family Well-Being
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension
- 1890 Research

Outcome # 7

1. Outcome Target

Number of adults/families who change a behavior or use a new skill related to nutrition and health such as choosing healthier foods and increasing physical.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 701 - Nutrient Composition of Food
- 702 - Requirements and Function of Nutrients and Other Food Components
- 703 - Nutrition Education and Behavior
- 724 - Healthy Lifestyle
- 801 - Individual and Family Resource Management
- 802 - Human Development and Family Well-Being
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension
- 1890 Research

Outcome # 8

1. Outcome Target

Number of participants who train others to eat more healthy foods and/or become more active.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 701 - Nutrient Composition of Food
- 702 - Requirements and Function of Nutrients and Other Food Components
- 703 - Nutrition Education and Behavior
- 724 - Healthy Lifestyle
- 801 - Individual and Family Resource Management
- 802 - Human Development and Family Well-Being
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension
- 1890 Research

Outcome # 9

1. Outcome Target

Number of delivery systems/access points that change their procedures and/or policies with regard to expanding or improving their offering healthy foods or healthy activities.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 701 - Nutrient Composition of Food
- 702 - Requirements and Function of Nutrients and Other Food Components
- 703 - Nutrition Education and Behavior
- 724 - Healthy Lifestyle
- 801 - Individual and Family Resource Management
- 802 - Human Development and Family Well-Being
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension
- 1890 Research

Outcome # 10

1. Outcome Target

Number of participants who advance to higher knowledge and skill level in healthy lifestyle professional areas.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 701 - Nutrient Composition of Food
- 702 - Requirements and Function of Nutrients and Other Food Components
- 703 - Nutrition Education and Behavior
- 724 - Healthy Lifestyle
- 801 - Individual and Family Resource Management
- 802 - Human Development and Family Well-Being
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension
- 1890 Research

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges

- Populations changes (immigration, new cultural groupings, etc.)

Description

{NO DATA ENTERED}

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

Each of our Childhood Obesity initiatives conduct post evaluations. Many conduct pre and post evaluations and some collect longitudinal data.

Specifically, the Dining with Diabetes program conducts pre-, post-, and during-sessions evaluations of the participants that track knowledge and behavior changes and changes in clinical results. FNP uses the EFNEP Evaluation and Reporting System and FSNE Education and Administrative Reporting System.

Experiment Station research program evaluation will take place at two levels and on two different time cycles. All programs will be evaluated using these general criteria plus additional criteria tailored to each specific program as detailed in the Plan of Work under Outputs and State defined Outputs and Outcomes.

Annual evaluation will continue as before, looking at productivity in terms of immediate impact:

- Referee journal articles and books
- Professional presentations
- General audience papers and news reports
- M.S. and PhD graduates
- Trends in terms of competitive funding
- And in terms of longer-term impact:
- Citations in scientific journals
- Patents
- Successful technology transfer or start-ups based on research programs
- Awards based on continuing impact and research excellence

Every five years there will be a full portfolio review including:

- Long term productivity
- Relevance to our constituent groups and the State and Region
- The allocation of research inputs among the programs
- Consideration of eliminating some research programs that are not productive or have diminished relevance given NIFA and State priorities
- Consideration of adding additional program areas given NIFA and State priorities

This portfolio review will be conducted internally by a committee appointed by the Dean and externally by a committee composed by a subset of our College Visiting Committee.

V(A). Planned Program (Summary)

Program # 5

1. Name of the Planned Program

Food Safety

2. Brief summary about Planned Program

The Food Safety planned program works toward reducing the incidence of food-borne illness by eliminating causes of microbial resistance to contaminants, educating consumers and food safety professionals, and developing safe-food processing technologies.

• Community Food Preparation: Major initiatives at WVUES in community food preparation include food preservation and canning workshops and Venison 101.

• Commercial Food Preparation: WVUES major initiatives in commercial food preparation include food safety for food banks, ServSafe® Manager Food Safety Training, a food business workshop, a food defense workshop, and the Better Process Control School for Acidified Foods. The Experiment Station's primary activities involve food safety issues in management of processed fish and fish fillets in cold-water aquaculture operations, detection of pathogens in food products, and developing procedures for testing for and eradicating newly emerging waterborne bacteria that may enter the food supply.

• Beef Quality Assurance: The major initiatives led by WVUES in beef quality assurance include beef quality assurance certification, beef quality assurance training for students, beef quality assurance for WVU farm workers, NCBA stockman and stewardship sessions, WVUES winter education series, the West Virginia Cattlemen's short course for producers, and the West Virginia quality assurance feeder calf sale.

WV State University's Food Safety programs are integrated in the nutritional programs highlighted in section 5 through instruction on proper food preparation and food preservation techniques.

The WVU Experiment Station is strengthening its program in Food Safety by hiring additional faculty, both individually and jointly with WVUES. Our new agricultural sciences building, to be completed in 2016, will have labs dedicated to food safety research.

3. Program existence : Mature (More then five years)

4. Program duration : Long-Term (More than five years)

5. Expending formula funds or state-matching funds : Yes

6. Expending other than formula funds or state-matching funds : Yes

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
501	New and Improved Food Processing Technologies	25%	0%	0%	0%
502	New and Improved Food Products	25%	0%	0%	0%
504	Home and Commercial Food Service	50%	0%	0%	0%
703	Nutrition Education and Behavior	0%	25%	0%	0%
724	Healthy Lifestyle	0%	25%	0%	0%
802	Human Development and Family Well-Being	0%	25%	0%	0%
806	Youth Development	0%	25%	0%	0%
	Total	100%	100%	0%	0%

V(C). Planned Program (Situation and Scope)

1. Situation and priorities

More steps are being taken to improve U.S. food safety. Despite the added measures by the Food and Drug Administration (FDA) and the United States Department of Agriculture (USDA), millions of people suffer illness from food-borne illness and thousand die from complications secondary to infection. Extension is working toward reducing the incidence of food-borne illness and providing a safer food supply by eliminating causes of microbial resistance to contaminants, educating consumer and food safety professionals, and developing food processing technologies to improve safety.

Current priorities include:

We conduct the WV BQA certification program which follows the guidelines established by the Mid-Atlantic BQA program where producers are required to participate. We also deliver curriculum for a Youth BQA program. We also conduct the Acidified Foods School, in collaboration with Virginia Tech, which is a subset of the Better Process Control School. The school is required for processors of shelf-stable acidified foods.

Our home food preservation program addresses a renewed interest in canning home-grown foods due to the need of families for low-cost nutritious foods. We conduct general preservations classes, pressure cooker monitoring training, and specialized food preservation classes such as Venison 101. Finally, we teaching the public through Extension programs that emphasize the importance of following proper safe food handling practices - cleaning, washing hands; separating foods to avoid cross-contamination; cooking foods to proper internal temperatures to kill bacteria; and store leftovers quickly and properly.

2. Scope of the Program

- In-State Extension
- In-State Research
- Multistate Research
- Multistate Extension
- Integrated Research and Extension
- Multistate Integrated Research and Extension

V(D). Planned Program (Assumptions and Goals)

1. Assumptions made for the Program

Participating in educational outreach programs will help participants acquire the skills, attitudes, and behaviors to improve lifestyle habits, including safe food handling.

Serving as community resource will effectively provide opportunities to develop healthier practices in the home.

Many youth and their families are not aware of the prevalence of cross contamination and how to prevent it.

Many youth and their families are not aware of the guidelines they should use to prevent foodborne illnesses.

The BQA program will enhance production, feeder cattle marketing and leadership opportunities for WV beef and dairy producers participating in the program.

Before any product can be actually produced and sold in WV, a process authority has to approve the process and tell them what records to keep.

Extension can provides the approval service for free - if they go out of state it cost about $100 per food.

If home canners learn appropriate home food preservation methods they can prevent food-borne illnesses.

If low-income WV citizens learn appropriate food preservation methods, they will increase access to affordable, nutritious foods because they will be confident in preserving their own food at home.

Using tested procedures and recipes will help to prevent serious food-borne illnesses while preserving the quality of the food.

2. Ultimate goal(s) of this Program

To improve food handling practices thereby decreasing their risk of developing foodborne illness through food safety education through hands-on, experimental learning techniques and other educational venues.

To reduce the incidence of food-borne illness by eliminating causes of microbial resistance to contaminants, educating consumer and food safety professionals, and developing safe food processing technologies.

V(E). Planned Program (Inputs)

1. Estimated Number of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890
2016	21.0	1.0	0.5	0.0
2017	21.0	1.0	1.0	0.0
2018	21.0	1.0	1.0	0.0
2019	21.0	1.0	1.0	0.0
2020	21.0	1.0	1.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

The food safety planned program at West Virginia Extension will work towards reducing the incidence of food-borne illness by eliminating causes of microbial resistance to contaminants, educating consumer and food safety professionals, and developing safe food processing technologies.

Extension specialists and county agents at WVUES will generate vital information through evaluation to increase understanding of how to better utilize food safety technologies, preserve foods, and handle foods safely. WVU-ES faculty will be involved in local and regional efforts to train producers, adults, youth, and other Extension faculty and staff.

Extension program activities will include: food preservation and canning workshops, Venison 101, a popcorn science exhibition for youth, food safety for food banks, ServSafe® Manager Food Safety Training, a food business workshop, a food defense workshop, the Better Process Control School for Acidified Foods, beef quality assurance certification, beef quality assurance training for students, beef quality assurance for WVU farm workers, NCBA stockman and stewardship sessions, WVU-ES winter education series, the WV cattlemen's short course for producers, and the West Virginia quality assurance feeder calf sale. Programs will help gain skills in home food preservation, commercial food preservation, quality beef assurance, and implementing food businesses.

On-line educational programs, seminars, workshops, fact sheets, social media, new curricula and individual and group consultations will be used to educate WV citizens, youth development professionals, and extension faculty members.

The EFNEP and SNAP-ED curricula consist of a variety of lessons focused on nutrition, health, food safety, food resource management, and/or physical activity. Food demonstrations are conducted during each lesson so that participants can try new and more healthful foods.

Planned research also will address problems related to food quality and efficiency of food processing. Because fish proteins are especially susceptible to freeze and freeze-thaw cycle induced denaturation, one research focus will be on developing superior (measured by product quality and safety) methods of cryopreservation for fish fillet and restructured fish products. Additionally, research is being instituted to evaluate and develop non-thermal electron beam treatment as a critical control point to minimize microbial contamination, particularly in leafy green vegetables and ground meat products. A recently instituted and related area or research involves developing improved methods for protein and lipid recovery from trout processing by-products. This method is being exploited to develop commercial products.

2. Type(s) of methods to be used to reach direct and indirect contacts

Extension

Direct Methods	Indirect Methods
● Education Class ● Workshop ● Group Discussion ● One-on-One Intervention ● Demonstrations	● Newsletters ● Web sites other than eXtension

3. Description of targeted audience

Target groups include WV citizens who can or preserve foods, commercial food processors, beef producers, WVUES agents, youth, and residents from low to moderate income level households.

V(G). Planned Program (Outputs)

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
  - Direct Adult Contacts
  - Indirect Adult Contacts
  - Direct Youth Contacts
  - Indirect Youth Contact
- Number of patents submitted
- Number of peer reviewed publications

☑ Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(H). State Defined Outputs

1. Output Measure

- Number of general press articles
- Number of educational materials create or updated
- Number of workshops and other educational presentations for clients
- Number of professional/academic presentations
- Number of graduate students earning degrees

☑ Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(I). State Defined Outcome

O. No	Outcome Name
1	Number of participants who improve their knowledge of safe food handling practices.
2	Number of participants who increase or improve their skill in proper time and temperature controls in food preparation.
3	Number of participants who improve or increase skills in safe food handling practices such as preparing, cooking, and storing foods safely.
4	Number of participants who report using new food handling practices.
5	Number of youth who disseminate information about food safety to their families.
6	Number of youth who participate in Extension nutrition programs that receive one balanced, nutritionally correct meal per day that is prepared and held at safe.
7	Number of growers, producers, and food workers completing food safety certification.
8	Number of improved prevention, detection, control and intervention technologies adopted.
9	Number of projects characterizing social, economic, and/or cultural practices attributed to foodborne illness.

Outcome # 1

1. Outcome Target

Number of participants who improve their knowledge of safe food handling practices.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 501 - New and Improved Food Processing Technologies
- 502 - New and Improved Food Products
- 504 - Home and Commercial Food Service
- 703 - Nutrition Education and Behavior

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension
- 1890 Research

Outcome # 2

1. Outcome Target

Number of participants who increase or improve their skill in proper time and temperature controls in food preparation.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 501 - New and Improved Food Processing Technologies
- 502 - New and Improved Food Products
- 504 - Home and Commercial Food Service
- 703 - Nutrition Education and Behavior

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension
- 1890 Research

Outcome # 3

1. Outcome Target

Number of participants who improve or increase skills in safe food handling practices such as preparing, cooking, and storing foods safely.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 501 - New and Improved Food Processing Technologies
- 502 - New and Improved Food Products
- 504 - Home and Commercial Food Service
- 703 - Nutrition Education and Behavior

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension
- 1890 Research

Outcome # 4

1. Outcome Target

Number of participants who report using new food handling practices.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 501 - New and Improved Food Processing Technologies
- 502 - New and Improved Food Products
- 504 - Home and Commercial Food Service
- 703 - Nutrition Education and Behavior

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension
- 1890 Research

Outcome # 5

1. Outcome Target

Number of youth who disseminate information about food safety to their families.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 501 - New and Improved Food Processing Technologies
- 502 - New and Improved Food Products
- 504 - Home and Commercial Food Service
- 703 - Nutrition Education and Behavior

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension
- 1890 Research

Outcome # 6

1. Outcome Target

Number of youth who participate in Extension nutrition programs that receive one balanced, nutritionally correct meal per day that is prepared and held at safe.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 501 - New and Improved Food Processing Technologies
- 502 - New and Improved Food Products
- 504 - Home and Commercial Food Service
- 703 - Nutrition Education and Behavior

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension
- 1890 Research

Outcome # 7

1. Outcome Target

Number of growers, producers, and food workers completing food safety certification.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 501 - New and Improved Food Processing Technologies
- 502 - New and Improved Food Products
- 504 - Home and Commercial Food Service
- 703 - Nutrition Education and Behavior

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension
- 1890 Research

Outcome # 8

1. Outcome Target

Number of improved prevention, detection, control and intervention technologies adopted.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 501 - New and Improved Food Processing Technologies
- 502 - New and Improved Food Products
- 504 - Home and Commercial Food Service
- 703 - Nutrition Education and Behavior

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension
- 1890 Research

Outcome # 9

1. Outcome Target

Number of projects characterizing social, economic, and/or cultural practices attributed to foodborne illness.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 501 - New and Improved Food Processing Technologies
- 502 - New and Improved Food Products
- 504 - Home and Commercial Food Service
- 703 - Nutrition Education and Behavior

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension
- 1890 Research

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges

Description

{NO DATA ENTERED}

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

Evaluation of Extension programs will utilize:

- Workshop evaluations using after, retrospective, and pre-post methodologies
- Testing of products
- Observations of trainees performing procedures correctly

Experiment Station research program evaluation will take place at two levels and on two different time cycles. All programs will be evaluated using these general criteria plus additional criteria tailored to

each specific program as detailed in the Plan of Work under Outputs and State defined Outputs and Outcomes.

Annual evaluation will continue as before, looking at productivity in terms of immediate impact:

- Referee journal articles and books
- Professional presentations
- General audience papers and news reports
- M.S. and PhD graduates
- Trends in terms of competitive funding
- And in terms of longer-term impact:
- Citations in scientific journals
- Patents
- Successful technology transfer or start-ups based on research programs
- Awards based on continuing impact and research excellence

Every five years there will be a full portfolio review including:

- Long term productivity
- Relevance to our constituent groups and the State and Region
- The allocation of research inputs among the programs
- Consideration of eliminating some research programs that are not productive or have diminished relevance given NIFA and State priorities
- Consideration of adding additional program areas given NIFA and State priorities

V(A). Planned Program (Summary)

Program # 6

1. Name of the Planned Program

Community, Economic, Workforce Development

2. Brief summary about Planned Program

West Virginia is considered to be a lagging region in terms of economic development and growth, a characteristic shared by many states in the Appalachian region. While the region has abundant natural resources, particularly coal, natural gas, forests, water, and recreational opportunities, unemployment is typically higher than in the rest of the nation. Accordingly, the West Virginia Agricultural and Forestry Experiment Station has designated economic development and the quality of life in rural communities as one of our primary program areas. Work in this program area is divided into two categories: economic development and quality of life.

- Workforce Development: WVUES conducts workshops and training opportunities for workers in a variety of settings in West Virginia. Topics cover a broad range of subjects and include: ADA and Civil Rights Compliance, how to start non-profit organizations, grant writing, applying for farmers' market coupons, and cultural diversity. Included in this program area are workshops and training opportunities for Extension educators who in turn train others in their community. In addition, WV State University delivers training programs to develop a skilled workforce in social and creative industries resulting in participants increased ability to obtain employment with a livable wage.
- Leadership Development: WVUES relies on volunteers to carry out programs in the community. Groups that benefit from this training include the Community Education Outreach Service organization (CEOS), the Extension Master Gardener program, and 4-H programs, such as Energy Express. Topics include budgeting and planning for small organizations, public speaking, board responsibilities, and communications.
- Community Development: WVUES initiatives include The First Impressions Program, Government Planning and Public Policy, Business Retention and Expansion, Community Development East, and the Power of 10. This program area also includes the beautification efforts (non-food production) of the Extension Master Gardener program. These programs attract participants who are interested in initiating downtown revitalization programs to improve their community's capacity to attract and retain new business and make communities more desirable places to live and work. Likewise, WV State University continues to help small towns with revitalization of downtown areas, facilitation of needs assessments, strategic planning efforts, workshops and meetings, structural revitalization, dilapidated buildings, community clean-ups, accessing funding for efforts, and property redevelopment uses.
- Health and Safety: The protection of workers' rights is an important issue in West Virginia. WVUES faculty members conduct OSHA authorized courses for outreach trainers who are certified to implement hazard awareness courses to workers.
- Economic Development: WVSUES has developed strategic plans for regional economic projects and worked with local communities and area businesses to develop strategies for stabilizing existing market share or develop growth opportunities. Because a significant part of rural employment growth nationwide has occurred in non-traditional economic activities (including those capitalizing on natural resources and climate), a number of possible economic opportunities are currently being investigated by the Experiment Station, including pasture-finished beef, cool water aquaculture, wood utilization, organic production of vegetables and animal products, and ecotourism.
- Micro-Enterprise and Small Business Development: WV State University supports micro-enterprise, small business development, and retention and expansion efforts. They also provide incubation and mentoring services, access to capital assistance, and training for in management strategies and

marketing.

3. Program existence : Mature (More then five years)

4. Program duration : Long-Term (More than five years)

5. Expending formula funds or state-matching funds : Yes

6. Expending other than formula funds or state-matching funds : Yes

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
131	Alternative Uses of Land	0%	0%	10%	0%
134	Outdoor Recreation	10%	0%	15%	0%
602	Business Management, Finance, and Taxation	5%	0%	10%	0%
604	Marketing and Distribution Practices	0%	0%	15%	0%
605	Natural Resource and Environmental Economics	0%	0%	10%	0%
608	Community Resource Planning and Development	40%	0%	20%	0%
723	Hazards to Human Health and Safety	20%	0%	10%	0%
803	Sociological and Technological Change Affecting Individuals, Families, and Communities	10%	0%	0%	0%
804	Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures	0%	0%	5%	0%
805	Community Institutions and Social Services	10%	0%	0%	0%
903	Communication, Education, and Information Delivery	5%	0%	5%	0%
	Total	100%	0%	100%	0%

V(C). Planned Program (Situation and Scope)

1. Situation and priorities

For the past several decades, the communities served by WV Extension and Research have been affected by the loss of jobs in the extractive industries. Additionally, de-industrialization has continued in the chemical and manufacturing sectors. As a result, the skilled workforce has left, leaving an aged population. Communities are physically blighted making them unattractive to prospective new businesses and citizenry.

In collaboration with the national and state USDA office of Rural Development, the Northeast Center

and Southern Center for Rural Development, the WV Department of Agriculture, the WV Development office, area economic development authorities, local government and community members, WV Extension is taking a leadership role in helping the communities identify new markets, revitalize their affected buildings, attract or stabilize the local businesses, and enhance the workforce in targeted industries. Specifically, faculty and staff are promoting new cluster industries such as tourism, specialty foods, agriculture, and timber hardwoods.

Adults in West Virginia need training to fill important leadership and volunteer positions. WV Extension trains citizens to be leaders through the 4-H, CEOS, and Master Gardner programs. Extension provides occupational safety and health services and educational classes for veteran and novice union representatives, workers, union members and leaders, and other activists. Classes are on safety and health topics relevant to workers and their workplaces.

Fairs or festivals are an important part of West Virginian life. Extension assists this important economic growth area of the state by recruiting volunteer visitors, conducting site visits, writing recommendations and following progress, and working with local festival boards and the WV Fairs and Festivals Association.

Station research will focus on economic development and quality of life issues that occur primarily in rural communities having agricultural or forest based or other land based economies. It will focus on research to determine the keys to successfully increasing direct consumer sales of agricultural products (retail rather than wholesale) with integrated, birth to market production methods for livestock where beneficial; to institute programs which assist community-based efforts to establish recreation and/or tourism industries; to construct decision tools which assist in choosing among easement and land use alternatives; to develop methods to evaluate economic feasibility of niche or specialty markets; to formulate and implement procedures which compare alternative courses for economic development in terms of potential profit and degree of risk; to devise models predicting restorative, stress reducing capacity of recreational activities, and assess relationships between interpretation and level of tourism activity. Additionally, research which supports improvements in factors which affect quality of life independent of income may be equally important in stemming outflows of human capital.

2. Scope of the Program

- In-State Extension
- In-State Research
- Multistate Research
- Multistate Extension
- Integrated Research and Extension
- Multistate Integrated Research and Extension

V(D). Planned Program (Assumptions and Goals)

1. Assumptions made for the Program

Opportunities exist to offer sustainable economic growth to rural communities in ways which will not destroy the essence and character of the communities involved.

If State citizens and policy makers are given information and technical assistance about economic

opportunities and ways to improve the quality of life in rural communities they will effectively use that information to develop new businesses, improve existing businesses and improve rural communities.

There are new markets and opportunities that the businesses and communities can address.

Partners and funding opportunities are critical to the success of the program and will affect the outcomes. RESA receives money to put on classes for free and WVU does not. Fire departments typically do not have a lot of money to spend on training.

Research and assessment is an important role in effective program efforts.

We know that standards exist for workforce training and we can help students meet them with existing curriculum. We have instructors who have the desired skills and abilities to do this training.

Extension has the ability to do the training on aircraft crash rescue to national consensus standards and the prop to do the training. Airports must have this training and pay for it so the funding is secure. We have professional staff throughout the state who can help the program coordinator with the training.

West Virginia University Safety and Health Extension (WVUSHE) safety and health professionals are experienced and knowledgeable in the areas of teaching, research, and service. Interventions and solutions implemented by WVUSHE professionals are problem- or employer-specific and based on best practices accepted by OSHA and the safety profession in general.

The faculty involved with the Institute for Labor Studies and Research program (ILSR) are knowledgeable, innovative, and dedicated to meeting the needs of ILSR's clientele. The labor movement is simultaneously traditional and progressive, so the faculty must be able to address both traditional and evolving needs.

Through a very close-knit working relationship with our constituents, and with the support of WVU Extension, ILSR is able to develop appropriate need-oriented programs and perform relevant research. The exceptional ability of the ILSR faculty, the close relationship with ILSR's constituency, and WVU Extension's unwavering support will ensure the ILSR program's success.

2. Ultimate goal(s) of this Program

To assist rural West Virginia citizens, communities and policymakers by providing research-based experience and technologies to bear on economic development and quality of life issues.

To help communities, citizens and policy makers in developing diverse and robust local economies which provide sufficient opportunities for gainful employment while preserving the natural resources, environment and character of each community.

To equip members of the West Virginia workforce to become stronger and more efficient by developing skills related to their responsibilities and safety.

To equip volunteers to be better able to serve community programs in WV.

To make West Virginia communities more financially secure.

V(E). Planned Program (Inputs)

1. Estimated Number of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890
2016	21.0	7.0	2.5	0.0
2017	21.0	7.0	2.5	0.0
2018	21.0	7.0	2.5	0.0
2019	21.0	7.0	2.5	0.0
2020	21.0	7.0	2.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

The WV Extension and research units will work collaboratively with local non-profits, government agencies, community members, local businesses, etc. to address community vitality for urban and rural distressed communities. Extension will develop skills in the workforce related to their responsibilities and safety. Community members and government, non-profit, and community organizations leaders will improve the functioning of West Virginia communities and make them more financially secure. Volunteers will become better able to serve community programs in WV. On-line educational programs, seminars, workshops, fact sheets, social media, new curricula and individual and group consultations will be used to educate WV citizens, youth development professionals, and extension faculty members.

The research/experimental stations will conduct research; publish results in scientific journals and popular press; make presentations at scientific and professional meetings; and train graduate students. They will conduct community outreach in partnership with WVU and WVSU Extension through the Community Design Team and other avenues to help foster programs that enhance job opportunities and enhance the quality of life in the region. They will consult with policy makers to gain information about the key issues facing the region and to provide technical and educational information to help address those issues.

WVSU will take several integrated approaches. There will be a focus on green development, to include community gardens, farmers markets, pocket parks, walking trails, etc. There will also be an expansion of disaster preparedness efforts at the statewide level, with a primary emphasis on our Southern WV region. Staff will work extensively with clients who want to start a business, providing training and other services. They will continue the focus on specialty foods, artisans, agro-tourism and historic preservation and will expand a new component that focuses on the digital and social media cluster.

At WVUES program activities will be carried out in the following areas: the Fire Institute, Aircraft Crash Rescue Firefighting program, Institute for Labor Studies and Research, Safety, and Health Extension, Community Education Outreach Service organization (CEOS), the Master Gardener program, The First Impressions Program, Tourism, Government Planning and Public Policy, and Business Retention and Expansion.

2. Type(s) of methods to be used to reach direct and indirect contacts

Extension

Direct Methods	Indirect Methods
● Education Class ● Workshop ● Group Discussion ● One-on-One Intervention ● Demonstrations	● Newsletters ● Web sites other than eXtension

3. Description of targeted audience

The primary audience for our community and economic development activities is community managers; city, county, and state planners and policy makers; consultants and local development committees or groups, producers, processors and distributors, State citizens and community groups and educators.

Workforce programs target firefighters, EMS, law enforcement, first responders, upper management in the fire services, airport personnel, the general population, people who seek to implement or assist in the implementation of individual or employer compliance with state, federal, and local safety and health legislation, employers/owners of businesses.

Other audiences include local businesses, community-based organizations, fair and festivals boards, potential business start-ups, and regional economic development authorities.

Specialty populations include volunteers, immigrants, migrant workers, youth, disabled community members, older adults, the unemployed and the under-employed workforce members (with focus on low-to-mod income).

V(G). Planned Program (Outputs)

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
  - Direct Adult Contacts
  - Indirect Adult Contacts
  - Direct Youth Contacts
  - Indirect Youth Contact
- Number of patents submitted
- Number of peer reviewed publications

☑ Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(H). State Defined Outputs

1. Output Measure

- Number of general press articles
- Number of educational materials create or updated
- Number of workshops and other educational presentations for clients
- Number of professional/academic presentations
- Number of graduate students earning degrees

☑ Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(I). State Defined Outcome

O. No	Outcome Name
1	Number of participants in workforce development programs who increase their knowledge and skills.
2	Number of government and civic leaders who improve or increase skills.
3	Number of volunteers who increase or improve skills.
4	Number of adults who gain knowledge and skill related to working with you.
5	Number of workers who use a new skill.
6	Number of people certified or licensed to practice in the field.
7	Number of new groups or organizations that are established or enhanced by obtaining new sources of revenue, new licenses, etc.
8	Number of adults who successfully train youth in topics related to STEM, healthy living, and citizenship.
9	Number of government or civic groups that use a new skill or procedure.
10	Number of community specific plans developed and adopted in whole or in part to help enhance economic development and quality of life.
11	Number of business plans and successful start-ups in the State developed and implemented with assistance from the WVU and WV State University Extension and experimental stations.
12	Number of grants, financial awards or partnerships awarded or developed for use to support community, economic, workforce development initiatives.

Outcome # 1

1. Outcome Target

Number of participants in workforce development programs who increase their knowledge and skills.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 134 - Outdoor Recreation
- 602 - Business Management, Finance, and Taxation
- 604 - Marketing and Distribution Practices
- 605 - Natural Resource and Environmental Economics
- 608 - Community Resource Planning and Development
- 723 - Hazards to Human Health and Safety
- 803 - Sociological and Technological Change Affecting Individuals, Families, and Communities
- 804 - Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures
- 805 - Community Institutions and Social Services
- 903 - Communication, Education, and Information Delivery

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension
- 1890 Research

Outcome # 2

1. Outcome Target

Number of government and civic leaders who improve or increase skills.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 134 - Outdoor Recreation
- 602 - Business Management, Finance, and Taxation
- 604 - Marketing and Distribution Practices
- 605 - Natural Resource and Environmental Economics
- 608 - Community Resource Planning and Development
- 723 - Hazards to Human Health and Safety

- 803 - Sociological and Technological Change Affecting Individuals, Families, and Communities
- 804 - Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures
- 805 - Community Institutions and Social Services
- 903 - Communication, Education, and Information Delivery

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension
- 1890 Research

Outcome # 3

1. Outcome Target

Number of volunteers who increase or improve skills.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 134 - Outdoor Recreation
- 602 - Business Management, Finance, and Taxation
- 604 - Marketing and Distribution Practices
- 605 - Natural Resource and Environmental Economics
- 608 - Community Resource Planning and Development
- 723 - Hazards to Human Health and Safety
- 803 - Sociological and Technological Change Affecting Individuals, Families, and Communities
- 804 - Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures
- 805 - Community Institutions and Social Services
- 903 - Communication, Education, and Information Delivery

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension
- 1890 Research

Outcome # 4

1. Outcome Target

Number of adults who gain knowledge and skill related to working with you.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 134 - Outdoor Recreation
- 602 - Business Management, Finance, and Taxation
- 604 - Marketing and Distribution Practices
- 605 - Natural Resource and Environmental Economics
- 608 - Community Resource Planning and Development
- 723 - Hazards to Human Health and Safety
- 803 - Sociological and Technological Change Affecting Individuals, Families, and Communities
- 804 - Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures
- 805 - Community Institutions and Social Services
- 903 - Communication, Education, and Information Delivery

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension
- 1890 Research

Outcome # 5

1. Outcome Target

Number of workers who use a new skill.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 134 - Outdoor Recreation
- 602 - Business Management, Finance, and Taxation
- 604 - Marketing and Distribution Practices
- 605 - Natural Resource and Environmental Economics
- 608 - Community Resource Planning and Development
- 723 - Hazards to Human Health and Safety

- 803 - Sociological and Technological Change Affecting Individuals, Families, and Communities
- 804 - Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures
- 805 - Community Institutions and Social Services
- 903 - Communication, Education, and Information Delivery

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension
- 1890 Research

Outcome # 6

1. Outcome Target

Number of people certified or licensed to practice in the field.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 134 - Outdoor Recreation
- 602 - Business Management, Finance, and Taxation
- 604 - Marketing and Distribution Practices
- 605 - Natural Resource and Environmental Economics
- 608 - Community Resource Planning and Development
- 723 - Hazards to Human Health and Safety
- 803 - Sociological and Technological Change Affecting Individuals, Families, and Communities
- 804 - Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures
- 805 - Community Institutions and Social Services
- 903 - Communication, Education, and Information Delivery

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Research

Outcome # 7

1. Outcome Target

Number of new groups or organizations that are established or enhanced by obtaining new sources of revenue, new licenses, etc.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 134 - Outdoor Recreation
- 602 - Business Management, Finance, and Taxation
- 604 - Marketing and Distribution Practices
- 605 - Natural Resource and Environmental Economics
- 608 - Community Resource Planning and Development
- 723 - Hazards to Human Health and Safety
- 803 - Sociological and Technological Change Affecting Individuals, Families, and Communities
- 804 - Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures
- 805 - Community Institutions and Social Services
- 903 - Communication, Education, and Information Delivery

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension
- 1890 Research

Outcome # 8

1. Outcome Target

Number of adults who successfully train youth in topics related to STEM, healthy living, and citizenship.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 134 - Outdoor Recreation
- 602 - Business Management, Finance, and Taxation
- 604 - Marketing and Distribution Practices
- 605 - Natural Resource and Environmental Economics
- 608 - Community Resource Planning and Development
- 723 - Hazards to Human Health and Safety
- 803 - Sociological and Technological Change Affecting Individuals, Families, and Communities
- 804 - Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures
- 805 - Community Institutions and Social Services
- 903 - Communication, Education, and Information Delivery

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension
- 1890 Research

Outcome # 9

1. Outcome Target

Number of government or civic groups that use a new skill or procedure.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 134 - Outdoor Recreation
- 602 - Business Management, Finance, and Taxation
- 604 - Marketing and Distribution Practices
- 605 - Natural Resource and Environmental Economics
- 608 - Community Resource Planning and Development
- 723 - Hazards to Human Health and Safety
- 803 - Sociological and Technological Change Affecting Individuals, Families, and Communities
- 804 - Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures
- 805 - Community Institutions and Social Services
- 903 - Communication, Education, and Information Delivery

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension
- 1890 Research

Outcome # 10

1. Outcome Target

Number of community specific plans developed and adopted in whole or in part to help enhance economic development and quality of life.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 134 - Outdoor Recreation
- 602 - Business Management, Finance, and Taxation
- 604 - Marketing and Distribution Practices
- 605 - Natural Resource and Environmental Economics
- 608 - Community Resource Planning and Development
- 723 - Hazards to Human Health and Safety
- 803 - Sociological and Technological Change Affecting Individuals, Families, and Communities
- 804 - Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures
- 805 - Community Institutions and Social Services
- 903 - Communication, Education, and Information Delivery

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Research

Outcome # 11

1. Outcome Target

Number of business plans and successful start-ups in the State developed and implemented with assistance from the WVU and WV State University Extension and experimental stations.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 134 - Outdoor Recreation
- 602 - Business Management, Finance, and Taxation
- 604 - Marketing and Distribution Practices
- 605 - Natural Resource and Environmental Economics
- 608 - Community Resource Planning and Development
- 723 - Hazards to Human Health and Safety
- 803 - Sociological and Technological Change Affecting Individuals, Families, and Communities
- 804 - Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures
- 805 - Community Institutions and Social Services
- 903 - Communication, Education, and Information Delivery

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension
- 1890 Research

Outcome # 12

1. Outcome Target

Number of grants, financial awards or partnerships awarded or developed for use to support community, economic, workforce development initiatives.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 134 - Outdoor Recreation
- 602 - Business Management, Finance, and Taxation
- 604 - Marketing and Distribution Practices
- 605 - Natural Resource and Environmental Economics
- 608 - Community Resource Planning and Development
- 723 - Hazards to Human Health and Safety
- 803 - Sociological and Technological Change Affecting Individuals, Families, and Communities
- 804 - Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures
- 805 - Community Institutions and Social Services
- 903 - Communication, Education, and Information Delivery

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension
- 1890 Research

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes

- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

Description

{NO DATA ENTERED}

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

Pre- and post-tests and successful completion of trainings will be used to evaluate educational programs. Observations of participants in works settings and in community settings will also be used.

Experiment Station research program evaluation will take place at two levels and on two different time cycles. All programs will be evaluated using these general criteria plus additional criteria tailored to each specific program as detailed in the Plan of Work under Outputs and State defined Outputs and Outcomes.

Annual evaluation will continue as before, looking at productivity in terms of immediate impact:

- Referee journal articles and books
- Professional presentations
- General audience papers and news reports
- M.S. and PhD graduates
- Trends in terms of competitive funding
- And in terms of longer-term impact:
- Citations in scientific journals
- Patents
- Successful technology transfer or start-ups based on research programs
- Awards based on continuing impact and research excellence

Every five years there will be a full portfolio review including:

- Long term productivity
- Relevance to our constituent groups and the State and Region
- The allocation of research inputs among the programs
- Consideration of eliminating some research programs that are not productive or have diminished relevance given NIFA and State priorities
- Consideration of adding additional program areas given NIFA and State priorities

This portfolio review will be conducted internally by a committee appointed by the Dean and externally by a committee composed by a subset of our College Visiting Committee.

V(A). Planned Program (Summary)

Program # 7

1. Name of the Planned Program

Production/Sustainable Forestry

2. Brief summary about Planned Program

This program includes research to develop economically optimal, sustainable procedures for timber (primarily hardwood) management and harvest, to increase efficiency of utilization and develop new uses for hardwoods, and to devise means and processes to efficiently utilize wood and timber resources in unique and profitable ways. Timber management research includes specifically the development of models to predict yields from standing timber, protection of forest resources from insect pests, disease, and invasive species; harvest management for optimum regeneration and re-growth; responding to research needs and concerns of corporate and private owners; and providing economic comparisons among alternative management and harvesting methods.

Wood utilization research likewise will be focused on hardwoods with a goal of maximizing hardwood timber to lumber throughput, reducing impact of brown rot fungi; development of non-destructive methods to determine lumber strength and stiffness, expanding uses for Appalachian hardwoods, especially uses for harvest and processing residuals, and devising saw mill systems for moderate sized operations. Additional research will develop systems for use at harvest to optimize bucking; develop new uses for low quality hardwoods, use ground penetrating radar to develop nondestructive scanning methods to identify subsurface defects in hardwood logs, and incorporation of cellulose nanocrystals into biopolymer composites to determine the effect on mechanical properties.

West Virginia University Extension conducts educational outreach program to support research in timber management, logging, milling and forest stewardship practices, and wood utilization.

3. Program existence : Mature (More then five years)

4. Program duration : Long-Term (More than five years)

5. Expending formula funds or state-matching funds : Yes

6. Expending other than formula funds or state-matching funds : Yes

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
123	Management and Sustainability of Forest Resources	50%	0%	60%	0%
124	Urban Forestry	5%	0%	5%	0%
125	Agroforestry	20%	0%	0%	0%
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants	0%	0%	10%	0%
511	New and Improved Non-Food Products and Processes	5%	0%	25%	0%
604	Marketing and Distribution Practices	10%	0%	0%	0%
605	Natural Resource and Environmental Economics	10%	0%	0%	0%
	Total	100%	0%	100%	0%

V(C). Planned Program (Situation and Scope)

1. Situation and priorities

Hardwood forests cover approximately 80% of the state of West Virginia and represent an enormous state resource. Station research in timber production and wood utilization is focused on efficient, environmentally friendly, and sustainable methods of timber management and harvest, protection of our forest resources from insect pests, diseases and invasive species, and the development of value-added wood products and unique, innovative new uses for hardwood lumber. Examples of specific research areas of interest include examination of alternative harvesting methods; predicting lumber yields from measures on standing timber; protecting stands from diseases such as phytophthora, pests like Gypsy Moth and invasive species like Ailanthus; overcoming copper tolerance of brown rot fungi; developing non-destructive methods to evaluate lumber strength and stiffness; designing sawing systems to optimize profitability for small mills, use of logging residues, etc.

2. Scope of the Program

- In-State Extension
- In-State Research
- Multistate Research
- Multistate Extension
- Integrated Research and Extension
- Multistate Integrated Research and Extension

V(D). Planned Program (Assumptions and Goals)

1. Assumptions made for the Program

Stands of hardwood timber in West Virginia represent a renewable resource which will exist in perpetuity if sustainably managed. Our research and outreach programs can help inform the forest industry and private landowners about opportunities and technologies that will improve their profitability while sustaining the resource base and the environment.

2. Ultimate goal(s) of this Program

To increase efficiency and profitability of forest and timber management; control threats to timber production from insects, diseases, and invasive species; develop innovative uses for hardwood products and structures, and assure industry sustainability. To help both large and small operations improve efficiency and sustainability.

V(E). Planned Program (Inputs)

1. Estimated Number of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890
2016	10.0	0.0	7.0	0.0
2017	10.0	0.0	6.5	0.0
2018	10.0	0.0	6.0	0.0
2019	10.0	0.0	6.0	0.0
2020	10.0	0.0	6.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

The experiment station will conduct research on wood science, timber production and processing and new product design. Improve utilization for forest biomass and residuals, study forest pests and invasive species, and communicate our findings, with the help of WVU Extension to the public and the forest products industry; report results in scientific journals, popular press and professional meetings; train graduate students.

Extension programs target youths, landowners, and commercial enterprises. Activities including: forestry, logging and milling, WV GreenUp logging, and forest conservation.

2. Type(s) of methods to be used to reach direct and indirect contacts

Extension

Direct Methods	Indirect Methods

● Education Class ● Workshop ● Group Discussion ● One-on-One Intervention ● Demonstrations	● Newsletters ● Web sites other than eXtension

3. Description of targeted audience

The target audience for this program includes professional foresters, the forest-product industry, small and large woodlot owners, extension specialists, consultants, regulators and policy makers.

V(G). Planned Program (Outputs)

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
  - Direct Adult Contacts
  - Indirect Adult Contacts
  - Direct Youth Contacts
  - Indirect Youth Contact
- Number of patents submitted
- Number of peer reviewed publications

☑ Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(H). State Defined Outputs

1. Output Measure

- Number of general press articles
- Number of educational materials create or updated
- Number of workshops and other educational presentations for clients
- Number of professional/academic presentations
- Number of graduate students earning degrees

☑ Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(I). State Defined Outcome

O. No	Outcome Name
1	Number of program and workshop participants who gain knowledge or skills that will improve their forest operation management skills.
2	Number of new state wood products and materials developed
3	Number of WV forestry program participants using forestry by-products.
4	Number of program and workshop participants who gain knowledge or skills in urban forestry practices.

Outcome # 1

1. Outcome Target

Number of program and workshop participants who gain knowledge or skills that will improve their forest operation management skills.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 123 - Management and Sustainability of Forest Resources
- 124 - Urban Forestry
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 511 - New and Improved Non-Food Products and Processes
- 604 - Marketing and Distribution Practices
- 605 - Natural Resource and Environmental Economics

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension
- 1890 Research

Outcome # 2

1. Outcome Target

Number of new state wood products and materials developed

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 123 - Management and Sustainability of Forest Resources
- 124 - Urban Forestry
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 511 - New and Improved Non-Food Products and Processes
- 604 - Marketing and Distribution Practices
- 605 - Natural Resource and Environmental Economics

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

- 1890 Extension
- 1890 Research

Outcome # 3

1. Outcome Target

Number of WV forestry program participants using forestry by-products.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 123 - Management and Sustainability of Forest Resources
- 124 - Urban Forestry
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 511 - New and Improved Non-Food Products and Processes
- 604 - Marketing and Distribution Practices
- 605 - Natural Resource and Environmental Economics

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension
- 1890 Research

Outcome # 4

1. Outcome Target

Number of program and workshop participants who gain knowledge or skills in urban forestry practices.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 123 - Management and Sustainability of Forest Resources
- 124 - Urban Forestry
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 605 - Natural Resource and Environmental Economics

4. Associated Institute Type(s)

- 1862 Research
- 1890 Extension
- 1890 Research

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Programmatic Challenges

Description

{NO DATA ENTERED}

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

Experiment Station research program evaluation will take place at two levels and on two different time cycles. All programs will be evaluated using these general criteria plus additional criteria tailored to each specific program as detailed in the Plan of Work under Outputs and State defined Outputs and Outcomes.

Annual evaluation will continue as before, looking at productivity in terms of immediate impact:

- Referee journal articles and books
- Professional presentations
- General audience papers and news reports
- M.S. and PhD graduates
- Trends in terms of competitive funding
- And in terms of longer-term impact:
- Citations in scientific journals
- Patents
- Successful technology transfer or start-ups based on research programs
- Awards based on continuing impact and research excellence

Every five years there will be a full portfolio review including:

- Long term productivity
- Relevance to our constituent groups and the State and Region
- The allocation of research inputs among the programs
- Consideration of eliminating some research programs that are not productive or have diminished relevance given NIFA and State priorities

- Consideration of adding additional program areas given NIFA and State priorities

This portfolio review will be conducted internally by a committee appointed by the Dean and externally by a committee composed by a subset of our College Visiting Committee.

V(A). Planned Program (Summary)

Program # 8

1. Name of the Planned Program

Fundamental Plant and Animal Systems

2. Brief summary about Planned Program

Research involving fundamental plant and animal systems is designed to increase our basic scientific understanding of reproductive, nutritional, and general physiological systems and processes.

• Animal Systems: Practical problems addressed by the Experiment Station include embryonic mortality in sheep and cattle, performance-limiting amino acids in animal rations, and health and disease resistance in poultry.

• Plant Systems: The Experiment Station program emphasis varies from determining functions of ubiquitin and other polypeptide tags, to understanding basic mechanisms of flower senescence and cold shock adaptation, to combating the impacts of phytophthora and Chestnut blight, to defining and eliminating negative effects on grazing animals of ergot alkaloids produced by fungi symbiotic with pasture grasses.

3. Program existence : Mature (More then five years)

4. Program duration : Long-Term (More than five years)

5. Expending formula funds or state-matching funds : Yes

6. Expending other than formula funds or state-matching funds : Yes

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
201	Plant Genome, Genetics, and Genetic Mechanisms	0%	0%	10%	0%
206	Basic Plant Biology	0%	0%	10%	0%
301	Reproductive Performance of Animals	0%	0%	20%	0%
302	Nutrient Utilization in Animals	0%	0%	20%	0%
304	Animal Genome	0%	0%	20%	0%
305	Animal Physiological Processes	0%	0%	20%	0%
	Total	0%	0%	100%	0%

V(C). Planned Program (Situation and Scope)

1. Situation and priorities

Efficiency in the production of plant and animal products is enhanced by a thorough understanding of the ways in which biological systems interact with environmental conditions, including conditions which define habitat for wildlife, natural settings for recreational activities or alternate changes for the management of domestic plants and animals. A primary goal of research involving fundamental plant and animal systems at the West Virginia Experiment Station will be to support components of production agriculture, forestry and other land-based economic activities which are profitable under West Virginia conditions.
Research involving fundamental plant and animal systems is designed to increase our basic scientific understanding of reproductive, nutritional and general physiological systems and processes. On the animal side, practical problems addressed include embryonic mortality in sheep and cattle, infertility in dairy cows, performance limiting amino acids in animal rations, and health and disease resistance in poultry. For plants, the program emphasis includes determining the molecular interactions during nitrogen fixation symbiosis between legumes and rhizobial bacteria, characterization of arbuscular mycorrhizal fungi, determining functions of ubiquitin and other polypeptide tags, understanding basic mechanisms of flower senescence and cold shock adaptation, combating the impacts of phytophthora and Chestnut blight and defining and eliminating negative effects on grazing animals of ergot alkaloids produced by fungi that are symbiotic with pasture grasses. While not much integrated research goes on in this area, due to the basic nature of the science, the Chestnut blight project combines both research and extension in a highly effective, award winning, multistate research project.

2. Scope of the Program

- In-State Research
- Multistate Research

V(D). Planned Program (Assumptions and Goals)

1. Assumptions made for the Program

Natural variation exists in the efficiency of numerous physiological processes which characterize plant and animal species. Greater process control and efficiency of production generally result from a more complete understanding of the basic mechanisms which underlie a productive process. Work in the basic biological sciences will ultimately lead to new products and management practices that will benefit farmers, industry and State citizens.

2. Ultimate goal(s) of this Program

To develop greater understanding of usable variations in fundamental physiological processes of plants and animals which lead to increased returns to industries for which State producers/entrepreneurs have competitive advantage or to improved life quality for West Virginia families and communities.

V(E). Planned Program (Inputs)

1. Estimated Number of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890

2016	0.0	0.0	6.5	0.0
2017	0.0	0.0	7.0	0.0
2018	0.0	0.0	7.0	0.0
2019	0.0	0.0	7.0	0.0
2020	0.0	0.0	7.5	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

Conduct research that will ultimately lead to improved efficiency and competitiveness in the production of agricultural products; publish/present results in refereed journals/professional meetings; train graduate students.

2. Type(s) of methods to be used to reach direct and indirect contacts

Extension

Direct Methods	Indirect Methods
● Demonstrations ● Other 1 (Experiments)	● Other 1 (Professional presentations) ● Other 2 (Journal articles)

3. Description of targeted audience

The target audience for this area is composed animal and plant scientists, biochemists, professional practitioners, dieticians, regulators and agribusiness firms.

V(G). Planned Program (Outputs)

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
  - Direct Adult Contacts
  - Indirect Adult Contacts
  - Direct Youth Contacts
  - Indirect Youth Contact
- Number of patents submitted
- Number of peer reviewed publications

☑ Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(H). State Defined Outputs

1. Output Measure

- Number of general press articles
- Number of professional/academic presentations
- Number of graduate students earning degrees

☑ Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(I). State Defined Outcome

O. No	Outcome Name
1	Number of new cultivars ergot alkaloid deficient grasses at or near wild-type vigor developed.
2	Number of strategies using hypovirus as a biological control agent for Chestnut blight developed and employed.
3	Number of ovarian-specific genes affecting reproductive success identified.

Outcome # 1

1. Outcome Target

Number of new cultivars ergot alkaloid deficient grasses at or near wild-type vigor developed.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 206 - Basic Plant Biology

4. Associated Institute Type(s)

- 1862 Research
- 1890 Research

Outcome # 2

1. Outcome Target

Number of strategies using hypovirus as a biological control agent for Chestnut blight developed and employed.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 206 - Basic Plant Biology

4. Associated Institute Type(s)

- 1862 Research
- 1890 Research

Outcome # 3

1. Outcome Target

Number of ovarian-specific genes affecting reproductive success identified.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 301 - Reproductive Performance of Animals
- 304 - Animal Genome
- 305 - Animal Physiological Processes

4. Associated Institute Type(s)

- 1862 Research
- 1890 Research

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

- Appropriations changes
- Competing Public priorities

Description

{NO DATA ENTERED}

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

Experiment Station research program evaluation will take place at two levels and on two different time cycles. All programs will be evaluated using these general criteria plus additional criteria tailored to each specific program as detailed in the Plan of Work under Outputs and State defined Outputs and Outcomes.

Annual evaluation will continue as before, looking at productivity in terms of immediate impact:

- Referee journal articles and books
- Professional presentations
- General audience papers and news reports
- M.S. and PhD graduates
- Trends in terms of competitive funding
- And in terms of longer-term impact:
- Citations in scientific journals
- Patents
- Successful technology transfer or start-ups based on research programs
- Awards based on continuing impact and research excellence

Every five years there will be a full portfolio review including:

- Long term productivity
- Relevance to our constituent groups and the State and Region
- The allocation of research inputs among the programs
- Consideration of eliminating some research programs that are not productive or have diminished relevance given NIFA and State priorities
- Consideration of adding additional program areas given NIFA and State priorities

V(A). Planned Program (Summary)

Program # 9

1. Name of the Planned Program

Strengthening Families

2. Brief summary about Planned Program

The Strengthening Families planned program at WVUES and WVSUES work to improve the financial well-being of families and build strong primary adult and child/parent relationships in the state. The goals of the program include: 1) increasing knowledge and skills related to financial decision-making and family relationships; 2) ensuring the success of those who teach others about financial education and family relationships; 3) increasing collaborations between Extension and community organizations in order to strengthen families; 4) increasing the number of participants who are certified to provide childcare and offer family or financial training; and 5) increasing the amount of money raised as in-kind contributions to sustain programs.

- Parenting Education: The major initiatives in WVUES program were Healthy Families/Healthy Children, Strong Families Eat Together, Parenting Piece by Piece, Stewards of Children, Military Families, and Parenting Apart. WV State University's program is the Health Literacy project, which teaches parents how to track their child's medical records and advocate for their child's health.
- Adult Relationship Education: WVUES major initiatives within this program area is Healthy Families/Healthy Children, The Five Love Languages, and Marriage Preparation Training.
- Financial Management: Major initiatives for WVUES is Reality Store. WV State University provided financial literacy workshops offered in low-income areas.

3. Program existence : Mature (More then five years)

4. Program duration : Long-Term (More than five years)

5. Expending formula funds or state-matching funds : Yes

6. Expending other than formula funds or state-matching funds : Yes

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
724	Healthy Lifestyle	0%	20%	0%	0%
801	Individual and Family Resource Management	45%	20%	0%	0%
802	Human Development and Family Well-Being	45%	30%	0%	0%
803	Sociological and Technological Change Affecting Individuals, Families, and Communities	0%	10%	0%	0%
806	Youth Development	10%	20%	0%	0%
	Total	100%	100%	0%	0%

V(C). Planned Program (Situation and Scope)

1. Situation and priorities

Participating in family resource management programs, will provide individuals and families with opportunities to develop a better quality of life.

There are a significant number of individuals that lack the skills to incorporate healthier behaviors in their daily lives. Individuals and families participating in healthy lifestyles programming will increase their likelihood to have a better quality of health.

With the ongoing financial issues being faced in our county, there is a continuous need for programs to assist individuals and families with better financial management practices.

Parenting information is best delivered through partnerships with local organizations including schools and faith-based organizations because these institutions have access to parents and are trusted entities.
People who are given training that includes relationship skills tend to continue to use them after 5 years.

Many of those who are caring for our children in childcare centers in West Virginia are not trained adequately. Many childcare workers have high school or GED certificates but no higher education. Extension educators can provide college-level training on a variety of subjects related to child development and care.

Older adults in West Virginia have strong ties to their communities and rely on community leaders for information and support. A high percentage of older adults in West Virginia have low literacy skills. Many older adults in West Virginia are not computer knowledgeable and/or do not have access to computers.

2. Scope of the Program

- In-State Extension

- Multistate Extension
- Integrated Research and Extension

V(D). Planned Program (Assumptions and Goals)

1. Assumptions made for the Program

Participating in family resource management programs, will provide individuals and families with opportunities to develop a better quality of life.

There are a significant number of individuals that lack the skills to incorporate healthier behaviors in their daily lives. Individuals and families participating in healthy lifestyles programming will increase their likelihood to have a better quality of health.

With the ongoing financial issues being faced in our county, there is a continuous need for programs to assist individuals and families with better financial management practices.

Parenting information is best delivered through partnerships with local organizations including schools and faith-based organizations because these institutions have access to parents and are trusted entities.

People who are given training that includes relationship skills tend to continue to use them after 5 years.

Many of those who are caring for our children in childcare centers in West Virginia are not trained adequately. Many childcare workers have high school or GED certificates but no higher education. Extension educators can provide college-level training on a variety of subjects related to child development and care.

Older adults in West Virginia have strong ties to their communities and rely on community leaders for information and support. A high percentage of older adults in West Virginia have low literacy skills. Many older adults in West Virginia are not computer knowledgeable and/or do not have access to computers.

2. Ultimate goal(s) of this Program

West Virginia's families will become more stable and self-sufficient through improving financial management family relationships skills and building community coalitions.

West Virginia Extension programs will encompass a broad range of components to improve quality of life for individuals and families and address health, nutrition, resource management and overall wellness of the family unit.

West Virginia Extension programs will target individuals and families across the lifespan.

West Virginia Extension units will secure external funding and build a strong partner base, in support of family and health based education program initiatives.

V(E). Planned Program (Inputs)

1. Estimated Number of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890
2016	24.0	2.0	0.0	0.0
2017	24.0	2.0	0.0	0.0
2018	24.0	2.0	0.0	0.0
2019	24.0	2.0	0.0	0.0
2020	24.0	2.0	0.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

West Virginia Extension will ensure that West Virginia's families will become more stable and self-sufficient through improving financial management family relationships skills and building community coalitions.

Research on family relationships and finance will be performed by faculty members in other colleges at WVU and WVSU with participation, when appropriate, by Extension faculty members here and at other partnering institutions and Extension services. Extension specialists and county agents will also generate vital information through local research and evaluation to increase understanding of how to improve family life for WV citizens.

West Virginia Extension faculty will be involved in local and regional efforts to train family members, social service providers, judges and legislators, and other Extension faculty and staff.

Financial Education: Both WVUES and WVSUES contribute to effective money saving efforts by offering financial literacy workshops as well as providing free tax preparation available to anyone fitting the government requirements. The objective of our workshops is to provide a greater understanding for asset management to ensure a more secure financial future. WVUES offers Reality Store program.

Literacy and Technology: The FCS Technology Today Centers offer programs to resident living in subsidized housing communities. Delivering high-impact educational programs by instructing individuals and small groups in the areas of computer skills, literacy, and workforce development training are the main focus.

Health Literacy: WVSU offers a health literacy program that teaches adult, youth and veteran participants how to open the lines of communication with their health care provider(s).

Parenting and Relationships: Parenting and relationship programs at WVUES include: Strong Families Eat Together, Parenting Piece by Piece, The Five Love Languages, Stewards of Children, Marriage Preparation, and Parenting Apart.

On-line educational programs, seminars, workshops, fact sheets, social media, new curricula and individual and group consultations will be used to educate WV citizens, youth development professionals, and extension faculty members.

Training programs will be developed to improve skills in family budgeting, planning for retirement, parenting, personal communication, stress reduction, coping with divorce and separation, family mealtimes, child development, parenting grandchildren, caring for older adults and the disabled, and children sexual abuse.

2. Type(s) of methods to be used to reach direct and indirect contacts

Extension

Direct Methods	Indirect Methods
● Education Class ● Workshop ● Group Discussion ● Demonstrations	● Newsletters ● eXtension web sites ● Web sites other than eXtension

3. Description of targeted audience

The target recipients of family services will be individuals and families representing a wide range of diversity, throughout the state of West Virginia. Audiences include West Virginia parents, childcare providers in WV, older adults in WV, kin caregivers in WV, school teachers, WV citizens in significant personal relationships, volunteers, partners, Extension agents, legislators, and social service personnel.

V(G). Planned Program (Outputs)

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
  - Direct Adult Contacts
  - Indirect Adult Contacts
  - Direct Youth Contacts
  - Indirect Youth Contact
- Number of patents submitted
- Number of peer reviewed publications

☑ Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(H). State Defined Outputs

1. Output Measure

- Number of general press articles
- Number of educational materials create or updated
- Number of workshops and other educational presentations for clients
- Number of professional/academic presentations

☑ Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(I). State Defined Outcome

O. No	Outcome Name
1	Number of participants who increased their skills in family relationships including harmful behavior avoidance, beneficial parenting techniques, and communication.
2	Number of participants who improve or increase their skills in family financial management including, informed shopping, budgeting and establishing savings accounts.
3	Number of participants who increase or improve their skills in parenting.
4	Number of participants who change a behavior or use a new skill related to family management.
5	Number of individual participants and communities that participate in social networking activities through Extension programs.
6	Number of participants who train others.
7	Amount of money raised by participants to support the program.
8	Number of people certified or license to practice in the field.
9	Number of new groups or organizations related to family life or finance that are established or enhanced.
10	Number of economic improvements related to families.
11	Number of social improvements related to families.

Outcome # 1

1. Outcome Target

Number of participants who increased their skills in family relationships including harmful behavior avoidance, beneficial parenting techniques, and communication.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 801 - Individual and Family Resource Management
- 802 - Human Development and Family Well-Being
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

Outcome # 2

1. Outcome Target

Number of participants who improve or increase their skills in family financial management including, informed shopping, budgeting and establishing savings accounts.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 801 - Individual and Family Resource Management
- 802 - Human Development and Family Well-Being
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

Outcome # 3

1. Outcome Target

Number of participants who increase or improve their skills in parenting.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 801 - Individual and Family Resource Management
- 802 - Human Development and Family Well-Being
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

Outcome # 4

1. Outcome Target

Number of participants who change a behavior or use a new skill related to family management.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 801 - Individual and Family Resource Management
- 802 - Human Development and Family Well-Being
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

Outcome # 5

1. Outcome Target

Number of individual participants and communities that participate in social networking activities through Extension programs.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 801 - Individual and Family Resource Management
- 802 - Human Development and Family Well-Being
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

Outcome # 6

1. Outcome Target

Number of participants who train others.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 801 - Individual and Family Resource Management
- 802 - Human Development and Family Well-Being
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

Outcome # 7

1. Outcome Target

Amount of money raised by participants to support the program.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 801 - Individual and Family Resource Management
- 802 - Human Development and Family Well-Being
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

Outcome # 8

1. Outcome Target

Number of people certified or license to practice in the field.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 801 - Individual and Family Resource Management
- 802 - Human Development and Family Well-Being
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

Outcome # 9

1. Outcome Target

Number of new groups or organizations related to family life or finance that are established or enhanced.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 801 - Individual and Family Resource Management
- 802 - Human Development and Family Well-Being
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

Outcome # 10

1. Outcome Target

Number of economic improvements related to families.

2. Outcome Type : Change in Condition Outcome Measure

3. Associated Knowledge Area(s)

- 801 - Individual and Family Resource Management
- 802 - Human Development and Family Well-Being
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

Outcome # 11

1. Outcome Target

Number of social improvements related to families.

2. Outcome Type : Change in Condition Outcome Measure

3. Associated Knowledge Area(s)

- 801 - Individual and Family Resource Management
- 802 - Human Development and Family Well-Being
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

- Economy
- Appropriations changes
- Public Policy changes
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

Description

{NO DATA ENTERED}

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

Family programs will be evaluated to show impact. Programs will also undergo process evaluations.

Focus group studies that compare groups based on different variables will be utilized.

V(A). Planned Program (Summary)

Program # 10

1. Name of the Planned Program

Youth Development

2. Brief summary about Planned Program

The goals of the 4-H Youth program are: 1) develop youths into responsible leaders; 2) improve reading skills in youths; 3) create in youths an appreciation for science, technology, engineering, and math (STEM) and equip them for a technologically advanced society; and 4) increase the capacity of youths to maintain a healthy lifestyle. The four programmatic areas include:

- Citizenship and Global Education: Activities include clubs, camps, after-school programs, newsletters, social media interactions, and special educational programs, such as charting, career counseling, leadership skill development, global and cultural presentations, and trips to other countries.
- Literacy Education: WVU Extension's Energy Express is a statewide summer program that promotes school success of children living in low-income communities by providing learning experiences and an ethic of service among college students and community members. Other major initiatives are WV State University's PLANTERS programs.
- STEM: STEM activities focus on topics related to the environment, energy, forestry, agriculture, animals, technology, engineering, biological sciences, and physical sciences. These activities are incorporated into all 4-H initiatives.
- Healthy Lifestyle: WVU Extension's initiatives include the substance abuse educational program, Health Rocks; the Germ Stops Here program; and the dental health program. Healthy lifestyle initiatives conducted by WV State University include Germ City, which promotes proper hand-washing.
- Adult Leadership Development for Youth Activities: WVU Extension faculty members train adults to work with youths in West Virginia. These programs train club leaders, camp counselors and staff, Energy Express mentors, and 4-H agents.

3. Program existence : Mature (More then five years)

4. Program duration : Long-Term (More than five years)

5. Expending formula funds or state-matching funds : Yes

6. Expending other than formula funds or state-matching funds : Yes

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
802	Human Development and Family Well-Being	20%	40%	0%	40%
806	Youth Development	80%	60%	0%	60%
	Total	100%	100%	0%	100%

V(C). Planned Program (Situation and Scope)

1. Situation and priorities

Extension agents who work with 4-H youth should be situated at the local level. Communities throughout the state recognize the Extension agent as a resource and advocate in the area of youth development.

The 4-H program includes activities in which youths learn through 4-H projects and citizenship and leadership experiences. The curricula are supported through the efforts of local Extension agents and the support of statewide Extension specialists.

4-H supports the development of the essential elements for youth development: 1) Belonging through caring relationships, 2) Mastery through constructive learning experiences, 3) Independence through leadership opportunities, and 4) Generosity through opportunities to give back to others through service.

Research conducted at West Virginia University in recent years suggests that 4-H members obtain considerable enjoyment from club activities and acquire skills that are beneficial to their person, educational and occupational lives. Leadership experiences provided by 4-H, such as conducting meetings and public speaking, are considered to be of great value by former members.

Participating in positive youth development programs with positive adult staff and volunteers will result in young people becoming productive adults and good citizens.

There are a substantial number of children that are unaware of how to make good choices relating to healthy lifestyles; therefore, increasing youth awareness on the subject will be effective throughout their lives.

Funding priorities are constantly shifting with issues regarding youth programs and initiatives, so to show how youth programs impact the community, research and assessment should become a greater component of the programs.

There needs to be a major effort across the state to increase individual awareness and knowledge levels of evidence-based programming for youth tough 4-H.

Youth seeking careers in STEM fields are dramatically decreasing; therefore, increasing interest in the STEM fields through programs will increase the number of youth seeking STEM careers;

The public school system and local community centers are natural allies for providing comprehensive

programs and identifying under-served youth.

2. Scope of the Program

- In-State Extension
- Multistate Extension

V(D). Planned Program (Assumptions and Goals)

1. Assumptions made for the Program

Extension agents who work with 4-H youth should be situated at the local level. Communities throughout the state recognize the Extension agent as a resource and advocate in the area of youth development.

The 4-H program includes activities in which youths learn through 4-H projects and citizenship and leadership experiences. The curricula are supported through the efforts of local Extension agents and the support of statewide Extension specialists.

4-H supports the development of the essential elements for youth development: 1) Belonging through caring relationships, 2) Mastery through constructive learning experiences, 3) Independence through leadership opportunities, and 4) Generosity through opportunities to give back to others through service.

Research conducted at West Virginia University in recent years suggests that 4-H members obtain considerable enjoyment from club activities and acquire skills that are beneficial to their person, educational and occupational lives. Leadership experiences provided by 4-H, such as conducting meetings and public speaking, are considered to be of great value by former members.

Participating in positive youth development programs with positive adult staff and volunteers will result in young people becoming productive adults and good citizens.

There are a substantial number of children that are unaware of how to make good choices relating to healthy lifestyles; therefore, increasing youth awareness on the subject will be effective throughout their lives.

Funding priorities are constantly shifting with issues regarding youth programs and initiatives, so to show how youth programs impact the community, research and assessment should become a greater component of the programs.

There needs to be a major effort across the state to increase individual awareness and knowledge levels of evidence-based programming for youth though 4-H.

Youth seeking careers in STEM fields are dramatically decreasing; therefore, increasing interest in the STEM fields through programs will increase the number of youth seeking STEM careers.

The public school system and local community centers are natural allies for providing comprehensive programs and identifying under-served youth.

2. Ultimate goal(s) of this Program

To provide programs that encompass a broad range of components to increase civic engagement, promote healthy lifestyles, and academic achievement, specifically in the STEM fields.

To develop WV youths by increasing their sense of belonging, independence, generosity, and mastery though programs that focus on science, health and nutrition, expressive arts and agriculture.

To provide WV youths with positive relationships with responsible adults and like-minded peers.

Global competitiveness involving enhanced abilities to critically think and problem solve.

Increase the number of youth, especially underrepresented minorities, who become interested in STEM majors and pursuing careers with the STEM fields.

V(E). Planned Program (Inputs)

1. Estimated Number of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890
2016	59.0	6.5	0.0	0.0
2017	59.0	6.5	0.0	0.0
2018	59.0	6.5	0.0	0.0
2019	59.0	6.5	0.0	0.0
2020	59.0	6.5	0.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

West Virginia Extension units will ensure that youth will become responsible leaders of their state, country, and the world and will develop life skills related to citizenship, global understanding, literacy, science and technology, and healthy lifestyles. In addition, each unit will ensure that leaders who work with youth are skilled in designing and implementing programs that contain the essential elements of youth development and that enable youth to become responsible leaders.

Research on youth development will be performed by Extension specialists and researchers at WVU and WVSU, and at other institutions and at the national 4-H level, but Extension specialists will generate vital information through evaluation to increase understanding of how to change behavior related to youth development.

West Virginia Extension units will primarily be involved in local and regional efforts to train youth and adults in skill related to youth development and to increase collaboration with other universities, agencies and organizations.

4-H camps, both residential and day-camps, 4-H clubs, on-line educational programs, seminars, workshops, fact sheets, social media, new curricula and individual consultations will be used to educate

WV citizens, youth development professionals, and extension faculty members. 4-H Youth Development programming will include after-school, in-school, and summer based enrichment opportunities across the spectrum of mission mandates of 4-H (Science, Healthy Living, and Citizenship) and will be delivered through a variety of modalities.

Training programs will be developed to improve understanding of cultural differences and uniqueness; responsibility, leadership, communication, and decision-making skills; reading skills of children and reading skills with children; knowledge and skills related to STEM subjects and applying STEM skills outside of the 4-H context; healthy eating and physical activity skills; and career preparation skills.

The following youth-related activities will be emphasized at WVU Extension: 4-H Workforce Prep, Collegiate 4-H, Operation Military Kids, Post-Secondary Education, WVU 4-H Global Exchange, Young Adult Programs, Youth Leadership, Energy Express, Reading Partners, 4-H STEM Program, 4-H youth agriculture, CYFAR/PROSPER Project, 4-H Health Initiative, ATV Safety, Health Rocks, and the Youth Family Nutrition Program.

At WVSU Extension, the 4-H PLANTERS will include in school enrichment engaging preschoolers in literacy activities bridged with gardening activities using curricula from the Junior Master Gardener curriculum that is altered for the targeted audience. 4-H Mentoring is a leadership and citizenship program engaging youth in various activities that are aimed to increase their knowledge and competence in the above areas with the help of a caring adult. 4-H Science programs are designed to increase youth participants' knowledge and interest in the STEM fields, with a major goal aimed to provide information and instruct activities related to the scientific method. The CASTEM programs will further increase youth participants' interest and knowledge in science through the NASA/SEMAA program initiatives.

2. Type(s) of methods to be used to reach direct and indirect contacts

Extension

Direct Methods	Indirect Methods
● Education Class ● Workshop ● Group Discussion ● One-on-One Intervention ● Demonstrations	● Newsletters ● Web sites other than eXtension

3. Description of targeted audience

Children ranging from preschool to 8 years of age. Youths 9 to 21 years of age, primarily in 4-H programs. More than 85,000 youth are 4-H members and more than 6,000 adult volunteers work directly and indirectly with them. Volunteer and adult workers will be the focus of professional development and program sustainability.

V(G). Planned Program (Outputs)

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
  - Direct Adult Contacts
  - Indirect Adult Contacts
  - Direct Youth Contacts
  - Indirect Youth Contact
- Number of patents submitted
- Number of peer reviewed publications

☐ Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(H). State Defined Outputs

1. Output Measure

- Number of general press articles
- Number of educational materials create or updated
- Number of workshops and other educational presentations for clients
- Number of professional/academic presentations

☐ Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(I). State Defined Outcome

O. No	Outcome Name
1	Number of youth participants who improve or increase skills in STEM subjects including agriculture and gardening skills.
2	Number of youth who report positive interests in science and/or an interest in pursuing a health, science, or technology-related career.
3	Number of youth participants who improve or increase leadership, communication, or citizenship skills.
4	Number of youth who increase their appreciation for cultural diversity and respect for other cultures.
5	Number of youth who improve or increase healthy living skills including consuming healthy foods and engaging in physical activity.
6	Number of youth who increase or improve their literacy skills.
7	Number of youth who increase knowledge and skills about risky behavior avoidance.
8	Number of youth who participate in service learning activities, community activities or issues.
9	Number of youth who express an interested in engaging in service learning activities, community activities and issues later in life.
10	Number of youth who engage in safety practices.
11	Number of youth participants who use a new skill that they learned in a 4-H activity.
12	Number of youth attending expressive arts programs who demonstrate mastery of their creative art.
13	Number of youth who improve their grade point average or other assessment score related to academic achievement.

Outcome # 1

1. Outcome Target

Number of youth participants who improve or increase skills in STEM subjects including agriculture and gardening skills.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 802 - Human Development and Family Well-Being
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

Outcome # 2

1. Outcome Target

Number of youth who report positive interests in science and/or an interest in pursuing a health, science, or technology-related career.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 802 - Human Development and Family Well-Being
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

Outcome # 3

1. Outcome Target

Number of youth participants who improve or increase leadership, communication, or citizenship skills.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 802 - Human Development and Family Well-Being
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

Outcome # 4

1. Outcome Target

Number of youth who increase their appreciation for cultural diversity and respect for other cultures.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 802 - Human Development and Family Well-Being
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

Outcome # 5

1. Outcome Target

Number of youth who improve or increase healthy living skills including consuming healthy foods and engaging in physical activity.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 802 - Human Development and Family Well-Being
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

Outcome # 6

1. Outcome Target

Number of youth who increase or improve their literacy skills.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 802 - Human Development and Family Well-Being
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

Outcome # 7

1. Outcome Target

Number of youth who increase knowledge and skills about risky behavior avoidance.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 802 - Human Development and Family Well-Being
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

Outcome # 8

1. Outcome Target

Number of youth who participate in service learning activities, community activities or issues.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 802 - Human Development and Family Well-Being
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

Outcome # 9

1. Outcome Target

Number of youth who express an interested in engaging in service learning activities, community activities and issues later in life.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 802 - Human Development and Family Well-Being
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

Outcome # 10

1. Outcome Target

Number of youth who engage in safety practices.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 802 - Human Development and Family Well-Being
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

Outcome # 11

1. Outcome Target

Number of youth participants who use a new skill that they learned in a 4-H activity.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 802 - Human Development and Family Well-Being
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

Outcome # 12

1. Outcome Target

Number of youth attending expressive arts programs who demonstrate mastery of their creative art.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 802 - Human Development and Family Well-Being
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

Outcome # 13

1. Outcome Target

Number of youth who improve their grade point average or other assessment score related to academic achievement.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 802 - Human Development and Family Well-Being
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

- Economy
- Appropriations changes
- Public Policy changes
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

Description

{NO DATA ENTERED}

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

4-H and Youth Development activities will utilize the National 4-H common measures to evaluate effectiveness.

Some programs will have specialized evaluation protocols such as our residential camps.

Focus groups and other qualitative methodologies will be used to evaluate programs.