

2015 Virginia State University and Virginia Polytechnic Inst. & State University Combined Research and Extension Plan of Work

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I. Plan Overview

1. Brief Summary about Plan Of Work

Virginia Cooperative Extension (VCE), a partnership between Virginia Polytechnic Institute and State University (VT) and Virginia State University (VSU), the Virginia Agricultural Experiment Station (VAES) and the Virginia State University Agricultural Research Station (VSUARS), enables people to improve their lives through research and education using scientific knowledge focused on the issues and needs of the citizens of Virginia. Audiences are involved in designing, implementing, and evaluating needs-driven programs. VCE, VAES and VSUARS are dynamic organizations which stimulate positive personal and societal change leading to more productive lives, families, farms, and forests, as well as a better environment in urban and rural communities.

VCE's GOALS are to: 1) develop and transfer new knowledge in applied and basic life sciences, 2) perform relevant, objective, and timely research 3) improve the quality of life for communities and citizens in the Commonwealth, 4) use a systems approach to programming, with task-oriented work teams that respond to the needs of individuals, groups, and organizations, 5) work with at-risk, underserved, and underrepresented audiences who need focused and specialized attention, 6) fully integrate a culturally diverse paid and volunteer staff in planning, implementing, and evaluating programs, and 7) recruit and collaborate with public and private partners to better utilize resources, heighten impact, and reach a more diverse audience. In particular, VSU's Extension program goals are to: 1) improve local and state economies by helping small and limited-resource farmers and citizens garner resources to own, operate, and sustain small businesses, 2) educate and empower socially disadvantaged farmers to produce, distribute, and market, organic, locally grown, and ethnic foods to feed Virginia's citizens, 3) ensure safe food supplies by teaching small-scale growers and farm families effective food safety practices, 4) address health issues and nutrition practices that confront limited-resource urban and rural citizens, 5) help youth, families, and seniors manage money to survive during challenging economic times, and 6) enable parents and families to leave their children in high quality and safe child-care environments.

The mission of VAES is to perform basic and applied research on agricultural, environmental, and natural and community resource issues related to the future needs of Virginia, the region, the nation, and the world. Research is designed to provide knowledge that will enhance the quality of individual and family life and the social and economic vigor of Virginia. Researchers utilize the best techniques of qualitative and quantitative research to form the knowledge base for instruction of and application to the broader mission of the land-grant university. The mission of VAES is to perform basic and applied research on agricultural, environmental, and natural and community resource issues related to the future needs of Virginia, the region, the nation, and the world. Research is designed to provide knowledge that will enhance the quality of individual and family life and the social and economic vigor of Virginia. Researchers utilize the best techniques of qualitative and quantitative research to form the knowledge base for instruction of and application to the broader mission of the land-grant university.

The Virginia Agricultural Experiment Station is committed to developing and implementing agricultural research that addresses society's needs and expectations. The College is focused on

addressing the needs of production agriculture, improving human and animal health and nutrition, enhancing the quality of the environment, reducing the effects of major infectious diseases, developing value-added products from biological resources, building viable communities, and preventing chronic diseases such as obesity, heart disease, and diabetes. Research programs are conducted on the main campus as well as at the eleven Agricultural Research and Extension Centers located across the commonwealth.

The research focus of VSU's Agricultural Research Station includes the following: developing production systems that conserve natural resources; crop diversity and alternative crops; economically competitive and sustainable small-scale agricultural systems; bio-based energy production; improving food safety and quality; and value-added plant and animal products.

PLANNING: VAES, VSUARS, and VCE address a broad range of problems and issues facing citizens of Virginia through focused research and educational programming. The foundation for Research and Extension programs are built on the identification and prioritization of strategic issues through situation analyses, which are accomplished through the examination of trends and emerging issues identified by local advisory groups in Unit offices (Extension Leadership Councils), Agricultural Research and Extension Center (AREC) Advisory groups, and individual Extension specialists. Each year Unit offices are asked to review their latest local situation analysis for necessary updates. Unit situation analyses are the background and rationale for deciding which problems and issues will be addressed and reported on by VAES, VSUARS, and VCE.

VCE uses a program planning and reporting process that is based on the objectives identified in the 2011-2016 VCE Strategic Plan. Program Teams that are aligned with Strategic Plan objectives made up of agents, specialists, and others have been established. Each Program Team coordinates programming across the state to meet the needs identified by their aligned Strategic plan objectives. This includes situation analysis, program planning, program development, evaluation, and reporting.

REPORTING: All VT and VSU Extension and research faculty annually report through the VT College of Agricultural and Life Sciences' electronic Faculty Annual Reporting System (eFARS). This system includes annual program reports focused on faculty goals, outputs, outcomes, and other data for each planned program for teaching, research, and Extension at an individual, unit, college, and organizational level. Updates to eFARS and contact reporting each year continue to better align planning and reporting with the 7 planned programs presented in this report. All research faculty are required to propose peer-reviewed Experiment Station projects submitted to USDA/NIFA, and entered into REEport. Researchers prepare annual progress and termination reports reviewed by the VAES director before being submitted to REEport.

PLANNED PROGRAMS for 2015-2019: 1) Agriculture Profitability and Sustainability; 2) Biotechnology, Biomaterials and Energy; 3) Climate Change, Natural Resources and Environment; 4) Community Viability; 5) Food, Nutrition, and Health; 6) Strengthening Virginia Families; 7) Youth Development.

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

Year	Extension		Research	
	1862	1890	1862	1890
2015	339.0	27.0	248.5	15.5
2016	342.6	30.5	258.4	15.5

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

Year	Extension		Research	
	1862	1890	1862	1890
2017	350.6	34.5	275.6	15.5
2018	365.6	36.5	281.0	15.5
2019	373.9	39.0	286.4	15.5

II. Merit Review Process

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

- Combined External and Internal University External Non-University Panel
- Expert Peer Review

2. Brief Explanation

RESEARCH REVIEW

Research under the Hatch, McIntire-Stennis, and Animal Health and Disease Acts is conducted in the College of Agriculture and Life Sciences, College of Natural Resources, and Virginia-Maryland Regional College of Veterinary Medicine that constitute the Virginia Agricultural Experiment Station (VAES). Researchers are required to submit a research proposal through their departmental head, conforming to the format determined by the USDA. An internal administrative review confirms that the work proposed will utilize appropriate statistical methods and that the PI has obtained any needed approvals through the institutional review boards. In the College of Agriculture and Life Sciences, the proposal is subsequently peer reviewed by a minimum of three internal or external PhD level scientists. An additional panel review may be mandated. Proposal selection criteria include: 1) research relevance to the goals of the department and college; 2) needs of the people the research would serve; 3) priorities established by task forces, work groups, or commodity research committees; 4) objectives and procedures are clearly stated; 5) proposed duration is realistic; 6) appropriate or desirable cooperators; 7) impacts for Virginia (and elsewhere) or anticipated economic importance and 8) project leader competence.

The project leader submits the revised proposal to the department/unit head, and VAES Director or Associate Director, with a letter delineating the changes made from reviewer's recommendations and/or rebuttal for any recommendations not accepted. The project leader enters CRIS Forms AD-416 and AD-417 on the CRIS website-<http://cwf.uvm.edu/dris/> and sends a copy of the proposal electronically to the VAES office.

Any applicant at VSU Agricultural Research Station (ARS) completes and submits a Request for Approval to Submit Proposals Form to the Director of Research who reviews the pre-proposal and notifies the applicant about his decision whether the proposal can be developed fully or not.

Review of Full Evans-Allen Proposal - A full proposal is submitted by applicant(s) to the Director of Research will be reviewed internally. The proposal must address the needs of the

state and the United States, the degree of relevance of the proposal research to the land-grant mission and priorities of the University, the need for initiation of research in new areas, and other matters related to grantsmanship. The review focuses on the scientific and technical merit, opportunities for cooperation with other individuals and units within the University and the Virginia clientele.

EXTENSION REVIEW

The review process for Extension covers all programs conducted by VCE through fourteen program teams (PT). The PTs, made up of Extension specialists and agents, and experiment station researchers, review programs at least annually to maintain, modify, create, and report on programs to meet needs indentified through external and internal stakeholder input.

VCE addresses a broad range of issues facing the Commonwealth through focused educational programming. This is accomplished and reported through VCE's fourteen Program Teams and State Program Leaders who serve as partners for each Team. A web-based planning and reporting system, organized by our nine Planned Programs, documents program outputs and outcomes. Problems and issues identified through situation analysis are communicated throughout VCE and educational program plans are developed by the interdisciplinary PTs. Program proposals identify programming outputs, outcomes, and an evaluation plan to be conducted by the PTs. The program proposals are reviewed by VCE programming leadership.

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?

The Virginia Agricultural Experiment Station (VAES) conducts research relevant to the needs and priorities of the citizens of the Commonwealth and the nation. Research projects are established based on the input of advisory committees at eleven Agricultural Research and Extension Centers (ARECs) across the state. In addition, the twelve academic departments within the College of Agriculture and Life Sciences each maintain stakeholder groups and the College of Agriculture and Life Sciences has an advisory group of producers, commodity groups, and agribusiness leaders that provide important feedback to VAES. In turn, VAES provides research-based input for the VCE programming process through faculty research, Extension specialists, and administratively through AREC directors and statewide Extension program leaders.

Virginia Cooperative Extension connects with the grassroots of the state through partnerships with Extension Leadership Councils (ELCs). At the local level, this partnership represents the diversity of each county, city, and town. Representation includes VCE program representatives from 4-H/Youth Development, Family and Consumer Sciences, Agriculture and Natural Resources and Community Viability, community leaders, and other organized community partners. Extension staff and Leadership Council members work as equal partners to determine needs, establish program priorities, plan and implement educational programs, identify and secure resources, market VCE and its programs, and evaluate and report program results/impacts to program stakeholders. Currently, all 107 Extension units in Virginia report having an organized local ELC.

At the state level, local connections are made through the Virginia Cooperative Extension Leadership Council (VCELC). The partnership includes volunteer leaders representing the 22 planning districts of Virginia, at-large members appointed by the director and administrator, all VCE District Directors, all chairpersons (or designees) of FCS and 4-H leadership councils, the VCE Director (VT), the VCE Administrator (VSU), designated VCE staff from both VT and

VSU, the 1862 director of the agricultural experiment stations, and the 1890 director of research. The VCELC provides a formal mechanism for VSU and VT to receive stakeholder input for Extension and research programs.

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

The stakeholder input process used by research and Extension includes opportunities to collect relevant issues and problems from under-served and under-represented populations. Campus-based faculty are sensitive to these populations and specifically include input from a broad representation of stakeholder groups to enhance their ability to include under-served and under-represented audiences and their needs. Field faculty are being challenged to increase and document efforts to address the needs of under-served and under-represented populations. In some cases, programs are specifically designed to address the needs of under-served and under-represented audiences. For example, parenting and bankruptcy education programs specifically target under-served and under-represented populations. Faculty are sensitive to this work and develop projects and programs incorporating input and needs from under-served and under-represented audiences. In addition, all Extension agents are required to record how they plan to serve underserved and underrepresented audiences in their personal action plans for each major program at the beginning of each program year. Finally, research and extension work at VSU is specifically targeted at reaching underserved and low-resource audiences.

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

Program Teams develop specific outcomes they expect faculty will address over a period of five years. These outcomes range from short-term (knowledge, attitude, skills and aspiration changes), to medium-term (practice or behavior changes), to long-term (broader impacts and situation change for individuals, communities, and systems). For each planned program, these outcomes will be monitored, evaluated, and documented each year through an evaluation plan. Program Teams are expected to meet at least twice a year to discuss their Plan of Work, including expected outcomes and impacts. Many of the teams meet throughout the year to plan, develop curriculum, create evaluation instruments, and discuss reporting. The VCE intranet contains documents, PowerPoints, and other tools to assist teams with this work. <http://www.ext.vt.edu/vce/reports/>

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

Virginia's integrated research and Extension planned programs have a historic and strong connection that increases the effectiveness and scope of both efforts. The results of the research agenda provide the basis for relevant and effective Extension programs. The outcomes of Extension programs inform the research agenda. This integrated approach embodies the Land Grant philosophy and results in improved effectiveness and efficiency of research and Extension educational programs for the benefit of the citizens of Virginia. The researcher explicates knowledge discovery and development and then connects with the Extension faculty through knowledge dissemination to change learning, behavior, and conditions.

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 selected individuals from general public
- Survey of traditional stakeholder groups
- Survey of traditional stakeholder individuals
- Survey of selected individuals from the general public
- Other (focus groups, listening sessions, issue forums, key informant interviews)

Brief explanation.

Virginia Cooperative Extension and Virginia Agricultural Experiment Station work with stakeholders to receive input through local Extension Leadership Councils and many other citizen groups at local and regional levels. The citizen groups reflect the agricultural producers and the socio-economic composition of their communities and focus on conducting programs which produce outcomes based on priority needs.

A systematic analysis of educational needs is integral for VCE program planning. Through situation analysis, needs of stakeholders are assessed, analyzed, and then shape program direction and plans. Traditional methodologies of seeking input include surveys, key informant interviews, issue forums, listening sessions and focus group interviews. To encourage participation, surveys are conducted with paper and web-based response options. Issue forums, listening sessions, and focus group interviews are held in multiple locations throughout service areas in convenient and comfortable environments for non-traditional and traditional stakeholders. Specific efforts are made to assess needs where underrepresented populations reside, and to market input sessions through communication channels used by targeted sectors of the population.

Representation on local Extension Leadership Councils (ELCs) includes all VCE programming areas: 4H/Youth Development (4H), Family and Consumer Sciences (FCS), Agriculture and Natural Resources (ANR), and Community Viability. Currently, all 106 Extension units in Virginia have an organized local ELC and all Agriculture Research and Extension Centers (ARECs) have active advisory councils. At the state level, VCE works with stakeholders through the state Leadership Council (VCELC). The group includes volunteers representing 22 planning districts in Virginia, at-large members appointed by the director of VCE, leaders representing Virginia's diverse population, businesses, agencies, organizations, VCE District Directors, chairs of VCE FCS, and 4H leadership councils, VCE Director from VT, VCE Administrator from Virginia State University, and deans of VSU and VT Colleges of Agriculture including the associate dean for research. State and local ELC meetings are held at times and locations convenient for the membership.

Virginia is a large, diverse state and as such, meeting locations are geographically distributed to ease travel burdens for members. Travel expenses are covered by VCE administration for meeting attendance. A faculty member works directly with the VCELC to assist with organizational development and logistics. The VSU Extension program works with stakeholders through the VCELC for the systematic analysis of educational needs to plan Extension programs. To ensure that adequate stakeholder input is received from limited-resource and underserved audiences, VSU

Extension is also informed by a VSU Agricultural Advisory Committee. Formed in 2008, the 15-member committee consists of members from agricultural commodity groups, the agri-business community, and public education. Other members include Extension professionals and volunteers, farmers, and a local legislator who advocates for the VSU School of Agriculture. All members work closely with or are aware of the needs of VSU's clients.

Advisory Committees inform teaching, research, and Extension programs within VSU's College of Agriculture and research programs within VAES and the college. VCE advisory committee member guidelines were used as a basis for selecting VSU Agriculture Advisory members. Committee members represent the Extension program areas of 4-H, agriculture and natural resources, and family and consumer sciences and are invited to serve by the Extension administrators and Dean of the School of Agriculture. VCE and the ARECs have long facilitated grassroots involvement, buy-in, and ownership in local programs. VCE formally connects with the grassroots of the state through partnerships with local volunteer ELCs. For the Virginia Agriculture Experiment Station (VAES), volunteer advisory councils provide stakeholder input. These partnerships represent the diversity of local clientele, communities, and industries across the Commonwealth of Virginia.

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 External Focus Groups
- Open Listening Sessions
- Use Surveys
- Other (Extension Leadership Councils)

Brief explanation.

The Virginia Agricultural Experiment Station (VAES) conducts research relevant to the needs and priorities of the citizens of the Commonwealth. Research projects are established based on the input of advisory committees at each of the eleven Agricultural Research and Extension Centers (ARECs) distributed across the state along with input from selected departmental advisory committees. The twelve academic departments within the College of Agriculture and Life Sciences each maintain stakeholder groups and the College has its own advisory committee of producers, commodity groups, and agribusiness leaders that provide important feedback to VAES. VAES provides research-based input to the VCE programming process through faculty research and Extension specialists and administratively through AREC directors and statewide Extension program leaders.

VCE formally establishes connectivity with the grassroots of the state through partnerships known as Extension Leadership Councils (ELCs). At the local level, this partnership represents the diversity of each county and city in which VCE exists as a resource. Representation includes VCE programming areas (4-H/Youth Development, Family and Consumer Sciences, Agriculture and Natural Resources and Community Viability), community leaders, and other organized community entities that partner with VCE. Extension staff and Leadership Council members work as equal partners to determine

needs, establish program priorities, plan and implement solutions, identify and secure resources, market VCE and its programs, and evaluate and report program results/impacts to program stakeholders. Currently, all 107 Extension units in Virginia report having an organized local ELC.

At the state level, local connectivity is achieved through the Virginia Cooperative Extension Leadership Council (VCELC). The partnership includes volunteer leaders representing the 22 planning districts of Virginia, at-large members appointed by the director and administrator, all VCE District Directors, all chairpersons (or designees) of VCE state program leadership councils for FCS, and 4-H, the VCE Director (VT), the VCE Administrator (VSU), designated VCE staff from VT and VSU, the 1862 director of the agricultural experiment stations, the 1890 director of research, and the director of governmental relations at VT. Extension provides a formal mechanism for VSU and VT to receive stakeholder input for Extension and research programs.

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)
- Survey of the general public
- Other (focus groups, key informant interviews, public issues forums, listening sessions)

Brief explanation.

A variety of methods will be used to collect stakeholder input and can include issues forums, focus groups, community surveys, key informant interviews, and listening sessions.

3. A statement of how the input will be considered

- In the Budget Process
- To Identify Emerging Issues
- In the Action Plans
- To Set Priorities
- Other (staff professional development)

Brief explanation.

Input from stakeholder groups is considered in identifying current and emerging issues, setting priorities for programs, developing implementation plans, and staff professional development offerings. This ultimately influences the budgeting process.

V. Planned Program Table of Content

S. No.	PROGRAM NAME
1	Agriculture Profitability and Sustainability
2	Biotechnology, Biomaterials, and Energy
3	Community Viability
4	Food, Nutrition, and Health
5	Natural Resources, Environment, and Climate Change
6	Strengthening Virginia Families
7	Youth Development

V(A). Planned Program (Summary)

Program # 1

1. Name of the Planned Program

Agriculture Profitability and Sustainability

2. Brief summary about Planned Program

For over 100 years, Virginia Cooperative Extension (VCE) and the Virginia Agricultural Experiment Station (VAES) have conducted research and educational outreach focusing on a range of programs addressing ag production, human health, environmental, and economic issues through a wide variety of science based technologies. Citizens demand safe, pest and disease free homes, schools, recreational areas, and a safe and affordable food supply and a wholesome environment with minimal risks. Virginia agriculture is the number one industry with over \$54B of economic impact on the commonwealth.

Agriculture in Virginia has long been dominated by animal based industries (70% of market value) which rely on agronomic crops and forages to such an extent that Virginia is a grain deficit state, and imports large quantities of plant products from other areas. Agronomic and horticultural crops each account for 15% and 15% of market value, and together have a market value of \$858 million. In recent years, dramatic population increases in northern and eastern Virginia have resulted in substantial growth in the turf, ornamental, and landscape industries, with managed turf areas alone estimated at over 1.7 million acres. Urbanization and population growth has resulted in loss of prime farmland, dramatic increases in land values, and a growing number of lifestyle farmers, gardeners, and others interested in home horticulture. Environmental pressures may soon force dramatic changes in the animal industry, with consequences on associated plant industries of the state. Many rural areas of the state are facing economic stagnation or decline, but have substantial areas of land suitable for plant or plant-animal production systems. In short, all areas of the state have significant opportunities and challenges to develop new or improved plant based systems that are competitive, profitable, and environmentally friendly.

Crop and livestock production can be optimized if the agricultural components are studied and managed as a system rather than as discrete operations. Treating production operations holistically offers greater management flexibility, provides more environmentally and economically sound options, and creates safer and healthier conditions for workers and farm animals. Integrated, sustainable approaches, such as organic farming, precision agriculture, integrated pest management, nutrient management, and other soil and water conservation-oriented best management practices, will be incorporated into agronomic and vegetable crop and livestock production systems appropriate for both large and small producers.

Animal production impacts every region of the state, and makes a significant contribution to the economy of Virginia. Additionally, the value added by related processing and service industries and the economic impact of the businesses that support the various animal enterprises is considerable. As a result, research and VCE efforts to improve quantity, quality, profitability, and sustainability of animal production systems have played a significant role in Virginia agriculture for more than a century.

VAES researchers utilize biotechnological methods in disease diagnosis and monitoring, metabolic engineering for bioenergy, plant breeding and multiple other initiatives. Genomics and proteomics provide the tools to identify the molecular basis of plant disease resistance, develop improved bioenergy crops, explore mechanisms involved in disease vectoring and to explore numerous plant, animal and human health issues.

The well-being of Virginians is dependent on both their individual and family economic status. In addition, the impacts of changing markets and environmental issues affect not only their business but also their family well-being. Virginia agriculture and small business are undergoing dramatic change as business integration accelerates, traditional markets disappear, and trade, commodity, and environmental policies provide both new constraints on, and opportunities for business profits. Many small farmers are exploring high value, local, or niche markets for their products, while large farmers are leveraging assets, adopting technology, and exploring alternative end use markets. Cooperatives and other institutions are playing an increasing role in management decision making. Agricultural producers are attempting to capture a larger share of the consumer food dollar by forming marketing cooperatives, while vertically integrated business arrangements have become ever more widespread in livestock and grain production

Citizens demand safe, pest and disease free homes, schools, recreational areas, and a safe and affordable food supply and a wholesome environment with minimal risks. Infestations of insects, diseases, weeds, and nematodes result in significant crop and commodity losses every year. Growers, foresters, nurserymen, homeowners, and commercial applicators apply large amounts of pesticides to control these pests. Management practices used for pests of structures, schools, and other public settings also constitute a major health concern. VCE's pest management program strives to address this wide variety of pest problems with programs that reduce commodity losses to pests and the reliance on chemical pest controls.

Protection of livestock, poultry, and plants must include preventative measures to decrease the risk of non-invasive and invasive risks and tracking measures for implementation in the event of a threat. Biosecurity measures related to food and food sources are based on threats to food production practices, food supply, and food marketing. VCE is positioned to fill these educational needs and is the primary educator through the efforts of its agents and specialists.

To provide plants and plant products for a productive economy and high quality of life, research efforts must focus on improving, evaluating, and tailoring plants for specific uses, finding new ways to use them, and develop production and processing technologies that minimize environmental impacts while increasing producer competitiveness and profitability. Three areas are targeted in this program: 1) improvement of plants through plant breeding, genetics, and genomics, 2) new and improved uses of plants and plant products (bio-based products), and 3) production, processing, and marketing practices which increase profitability, ensure quality, and are environmentally friendly.

3. Program existence : Mature (More than 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%	15%	0%	0%
102	Soil, Plant, Water, Nutrient Relationships	10%	20%	10%	0%
104	Protect Soil from Harmful Effects of Natural Elements	0%	15%	0%	0%
111	Conservation and Efficient Use of Water	8%	15%	0%	0%
133	Pollution Prevention and Mitigation	0%	8%	0%	0%
201	Plant Genome, Genetics, and Genetic Mechanisms	0%	0%	10%	0%
202	Plant Genetic Resources	2%	0%	10%	15%
204	Plant Product Quality and Utility (Preharvest)	10%	0%	0%	20%
205	Plant Management Systems	18%	27%	10%	15%
206	Basic Plant Biology	0%	0%	5%	0%
211	Insects, Mites, and Other Arthropods Affecting Plants	5%	0%	5%	10%
212	Pathogens and Nematodes Affecting Plants	0%	0%	5%	0%
215	Biological Control of Pests Affecting Plants	1%	0%	0%	10%
216	Integrated Pest Management Systems	13%	0%	15%	0%
301	Reproductive Performance of Animals	4%	0%	5%	15%
302	Nutrient Utilization in Animals	0%	0%	5%	15%
307	Animal Management Systems	15%	0%	5%	0%
315	Animal Welfare/Well-Being and Protection	8%	0%	0%	0%
601	Economics of Agricultural Production and Farm Management	5%	0%	5%	0%
606	International Trade and Development	1%	0%	10%	0%
	Total	100%	100%	100%	100%

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

1. Situation and priorities

Virginia's producers are facing increases in land values, costs of production, and environmental regulation. Diseases threaten to reduce productivity and high value end uses. Undesirable plant components such as alkaloids, tannins, and indigestible carbohydrates are reducing animal performance

and limiting usefulness of plants for human consumption. Soils receiving manure from concentrated animal feeding operations are accumulating excess phosphorus levels, and could threaten soil and water quality. U.S. dependence on foreign oil and rising prices are stimulating interest in biomass production for synthesis of biofuels. Opportunities to use plants as a vehicle for manufacture of enzymes, pharmaceuticals, and other essential products require more secure production systems, more efficient extraction, fermentation, and processing methods.

While the most efficient producers can currently compete in the global commodity market, profitability must continue to increase. In some cases, this will involve increases in productivity through plant breeding and genomics, and through using better adapted varieties. Plants with specific high quality traits or components will be developed for new markets. New or underutilized plants with market potential will be evaluated and production systems developed. In other cases, more profitable alternatives such as ornamental and horticultural crops, organic production systems, bio-based products must be explored.

The viability of both large and small producers of crop and livestock food, fiber, and energy products is limited by economic and environmental factors. Such constraints can be alleviated through research and educational programs that address production efficiency, environmental controls, and business management. Increasing the production efficiency can increase profit to producers and decrease costs to consumers. Reducing environmental (soil, water, and air) degradation will benefit producers and society and improved business management will increase profitability and, thus, viability of producers. Integrated research and educational programs for both educators and producers on the technical (including nutrient management and soil testing, integrated pest management, tillage, cover cropping and other soil conservation practices, crop rotations, selection of appropriate plant cultivars, and other crop management practices) and business (including budgets, marketing, etc.) aspects of organic and sustainable production systems, precision agriculture, and environmental best management practices will enable farmers to produce food, fiber, and energy profitably while minimizing environmental degradation and optimizing consumer health. Personnel employed by the VCE and the VAES possess the expertise and experience to conduct research and research-based education programs to achieve these goals.

There is substantial pressure on animal industries to provide consumers with safe, high quality products at competitive prices. Furthermore, farm level producers are challenged to produce products of a quality which meet the needs of the marketplace while adding value to the enterprise. Increasing cost efficiencies in animal agriculture nationally have forced successful producers to intensify management to reduce per-unit costs or to adopt low input, extensive production systems. Animals must be produced and maintained in a manner which provides for the well-being of the animal, minimizes environmental effects, and makes wise use of limited resources. Environmental issues are an increasing concern.

Feeds comprise a major cost of livestock, poultry and aquaculture production. The development of feeds is a drawn out process of trials, measuring the suitability of feeds using measures such as growth and feed efficiency. New technical developments will allow measurement of animal response to feeds at the morphological, physiological, and gene expression levels, thereby greatly enhancing the development of feeds promoting the survival, growth, and well-being of food animals of agricultural and aquaculture importance. Gene discovery is one of the most important objectives in genomics research in agricultural biotechnology. The recent availability of enormous DNA sequence information coupled with the latest developments in engineering applications to biological instrumentation (lasers, robotics), have created a golden opportunity to address limitations of both high throughput screening and gene discovery programs.

Improved financial security of individuals, families, agricultural, and small businesses is critical for the long-term economic health of Virginia. Individuals and families, who have set financial goals and understand the importance of planning for future events ease the burden on government assistance. Understanding business, financial, and risk management are the underlying principles for obtaining long-term financial security for individual entrepreneurs. Profitable and successful farms and small businesses

are the cornerstone of robust families and the communities in which they live.

Infestations of insects, diseases, weeds, and nematodes result in significant crop and commodity losses every year. Pesticide misuse can have a significant impact on successful pest control, public safety, and the environment. Pest management and pesticide safety education are essential and viable solutions to addressing these issues.

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

Implementing efficient, economically-feasible, and environmentally sound integrated crop and/or livestock systems requires on-going research. Established and developing knowledge of production systems that include management of pests (weeds, insects, disease), soils (cover cropping, tillage, organic matter management, nutrient management), crops (selection of appropriate species and cultivars, planting timing, row spacing, and geometries, crop rotations, etc.), livestock (dietary management, grazing rotations, fencing, etc.), and business practices (purchase/use of external inputs, marketing of outputs, value-added products, cost-return ratios, etc.) must be extended in a timely and effective manner. Many organizations (e.g., Virginia Association for Biological Farming, Virginia commodity boards, Chesapeake Bay Foundation) and local (soil and water conservation districts), state (Virginia Departments of: Agriculture and Consumer Services, Conservation and Recreation, Environmental Quality, and Health), and federal agencies (Natural Resource Conservation Service) are providers of education, cost-share funding, marketing assistance, or permits and inspections of potentially environmentally-impacting practices.

VCE and VAES provide multidisciplinary expertise to address research and education needs employing an integrated approach. On-going established collaborations between VCE/VAES and other research and Extension faculty throughout the mid-Atlantic region enable Virginia to draw upon expertise for cooperation where gaps exist. VCE and VAES personnel work directly with farmers and staff from various organizations and agencies to impart knowledge and implement change among agricultural producers through a multiplier effect. Funding to implement these research and educational programs comes from state organizations (e.g., commodity boards), state agencies (e.g., Water Quality Improvement Funds and other conservation-promoting cost share funds), federal agencies (e.g., USDA), local and regional governments (e.g., sanitation districts), and regional organizations (e.g., Chesapeake Bay Foundation, National Fish and Wildlife Foundation).

We assume funding will remain constant or increase. The VCE program assumes availability of expertise in key scientific areas of animal physiology and nutrition, reproduction and genetics, animal health, environmental issues, food quality, and animal management systems. Such expertise is essential to apply best practices to animal production issues in these areas. Adequate resources to expand the body

of knowledge pertinent to the needs of Virginia animal production is assumed. Such resources include existing state owned research herds and flocks, research laboratories, an ample supply of highly trained, motivated, visionary researchers and associated staff. Further, it is assumed that economic circumstances will be favorable enough to motivate clientele to change and implement new procedures. Virginia animal production systems have survived the competitive agricultural climate for the entire history of the country. It is expected today's producers will continue to adopt best practices well tested scientifically and explained fully and clearly by trusted and well informed Extension personnel.

Lack of management skills and knowledge of basic economic and financial management and analysis skills, are obstacles to individual and family economic well-being. Farmers and small business owners are struggling to remain profitable. A stated priority is to research issues and opportunities available to these business people and then train and assist them to gain skills to adapt to these critical issues. The combination of research and Extension activities will enable Virginia's farms, small businesses, individuals and families to have financial security.

IPM research and extension programs will emphasize soybean, cotton, peanut, potato, forages, turf, apples, grapes, ornamentals, vegetables and insects at schools. To improve electronic delivery, the Virginia IPM web page will be completely revised to become a one-stop shopping site for pests of agriculture, community and natural areas. It will include new pages on soybean rust surveillance and management, urban IPM, and links to the Plant Diagnostic Clinic, Virginia Tech Pesticide Programs, biological control references, and the new email-delivered Virginia Ag Pest Advisory which provides weekly updates on pests of cotton, peanut, soybean, wheat, and vegetables.

It is assumed that world-wide production of essential food, feed grains, and forages will continue to increase at moderate rates to meet world demand. Recent fluctuations in oil prices have stimulated renewed interest in biofuel crops, improved grain prices, and shifted production in favor of corn and small grains for ethanol. It remains to be seen if these prices will be sustained long term, and what the effects will be on farm profitability, food costs, and degradation of essential environmental services. To ensure long term sustainability, efforts are focused on significant increases in productivity, quality, and price. Population growth and environmental degradation will continue for the life of this plan, and agricultural and associated non-agricultural land uses will play a vital role in mitigating these problems. Agriculture will remain a major contributor to the state's economy and food security, and will support open space, deliver scenic beauty for tourism, and provide essential and desirable ecosystem services. These drivers will continue to force reductions in land area devoted to production, and will require remaining productive lands towards growth of higher value plants and plant products. Commercial plant producers desire to be profitable, efficient and good stewards of the environment. Plant producers with no profit motive, such as homeowners and local government agencies, can be motivated to change behavior and attitudes toward good gardening/production practices with economically viable alternatives and well-designed educational programs. With the basic science, people, and tools in place to begin the discovery process, new developments and effective educational programs are critical for medium and long term success.

2. Ultimate goal(s) of this Program

Profitability of large and small farms in Virginia will increase and the quality of soil, water, and air associated with crop and livestock systems will improve. The goal is that farm profitability will increase by 4% annually. Agricultural best practices should reduce sediment and nutrient levels in the watershed by 5%. Improved cropping practices and fertilization practices will increase the efficiency of use of applied nutrients by 5%.

To improve the financial and economic well-being of Virginians and Virginia farm and business managers through targeted research and educational programs. VAES researchers, both on campus and stationed at off campus centers will conduct laboratory and field research aimed at producing the needed knowledge to allow the economical and environmentally appropriate control of important insect and

microbial pests. VCE and its stakeholders will sustain their partnerships to support a viable and active education program to reduce enforcement costs, maintain viable pest management options to protect agriculture, specialty areas, public health, and the environment, and to protect the public and occupational health and the environment from the misuse of pesticides. The pest management program will have positive impact on cost benefit ratios, human health, and the environment.

Continued improvement of existing animal production systems and/or development of new animal production systems will be continued that produce ample supplies of high quality products in an environmentally and socially responsible manner while supporting quality lifestyles. By doing so, animal agriculture in Virginia will remain competitive, profitable, and sustainable while producing products and services that meet consumer expectations.

To discover, develop, and disseminate knowledge promoting the sustainability of living natural resources and agricultural systems, particularly as impacted by bioinformatics, genomics and biotechnological approaches. To expand understanding of the applications and implications of genetics, genomics, and biotechnology. By focusing on plant improvement, genetic modification, and discovery of new uses for underutilized plant resources coupled with new or improved environmentally friendly ways of producing, handling, processing and refining, the program will deliver higher value plant and plant products and educational programs to plant producers that meet or exceed end-user requirements, protect environmental quality, and ensure agricultural profitability and a safe, secure food supply.

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
2015	120.9	15.0	168.6	9.5
2016	122.5	17.0	175.3	9.5
2017	122.5	18.0	187.1	9.5
2018	127.7	19.0	190.7	9.5
2019	130.7	20.0	194.4	9.5

V(F). Planned Program (Activity)

1. Activity for the Program

Conduct research experiments that educate and solve applied problems, establish partnerships to identify needs and develop solutions, conduct workshops, both traditional procedures and hands-on, and meetings to provide training for farmers and educators, organize and conduct state and regional conferences, establish on-farm demonstrations, develop enterprise budgets, develop products, curriculum, and resources for use by educators and directly by producers, and conduct assessments as needed to evaluate progress. Research-based information will be disseminated via media and informational meetings. Decision aids, workshops, detailed curriculum, and distance educational methods will be used to support change in the overall behavior of learners.

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

Extension

Direct Methods	Indirect Methods
<ul style="list-style-type: none"> ● Education Class ● Workshop ● Group Discussion ● One-on-One Intervention ● Demonstrations ● Other 1 (eXtension) 	<ul style="list-style-type: none"> ● Newsletters ● TV Media Programs ● eXtension web sites ● Other 1 (VCE Pubs)

3. Description of targeted audience

Commercial producers, 4-H youth, Master Gardeners, state and federal agency personnel, Extension educators, consumers, supermarket chain store buyers, animal owners, youth, allied industry personnel, consumers, policy-makers, academic colleagues, research scientists, government officials, high school teachers, general public, individuals, families, owners and managers of farms, and small businesses; local, state, and federal personnel, private sector service suppliers, advocacy and consumer protection groups and association, health/medical 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 publications created.
 - Number of Extension presentations delivered.
 - Number of peer-reviewed journal articles published.
 - The amount of competitive grant funding received.
- 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	Dollars saved through implementation of IPM practices over the last 5 years
2	Producers implement practices for quality assurance certification.
3	Adoption of BMPs results in greater profitability
4	Producers benefit from crop breeding programs
5	Direct marketing education improves long term sustainability of Virginia small farms
6	Virginia aquaculture producers improve profitability through enhanced disease management and productions techniques
7	Sorghum research seeks to reduce the need for imported grain for the swine industry
8	Researchers work to develop a Staphylococcus aureus vaccine that will protect cows against a common bacterial infection that leads to mastitis and reduced milk production.
9	Edamame research explores suitability of new cash crop for Soutside Virginia
10	Researchers explore native bee potential for orchard pollination

Outcome # 1

1. Outcome Target

Dollars saved through implementation of IPM practices over the last 5 years

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 205 - Plant Management Systems
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 215 - Biological Control of Pests Affecting Plants

4. Associated Institute Type(s)

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

Outcome # 2

1. Outcome Target

Producers implement practices for quality assurance certification.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 307 - Animal Management Systems
- 315 - Animal Welfare/Well-Being and Protection

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 3

1. Outcome Target

Adoption of BMPs results in greater profitability

2. Outcome Type : Change in Condition Outcome Measure

3. Associated Knowledge Area(s)

- 205 - Plant Management Systems

4. Associated Institute Type(s)

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

Outcome # 4

1. Outcome Target

Producers benefit from crop breeding programs

2. Outcome Type : Change in Condition Outcome Measure

3. Associated Knowledge Area(s)

- 202 - Plant Genetic Resources
- 205 - Plant Management Systems

4. Associated Institute Type(s)

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

Outcome # 5

1. Outcome Target

Direct marketing education improves long term sustainability of Virginia small farms

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 601 - Economics of Agricultural Production and Farm Management

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

Outcome # 6

1. Outcome Target

Virginia aquaculture producers improve profitability through enhanced disease management and productions techniques

2. Outcome Type : Change in Condition Outcome Measure

3. Associated Knowledge Area(s)

- 307 - Animal Management Systems

4. Associated Institute Type(s)

- 1890 Extension

Outcome # 7

1. Outcome Target

Sorghum research seeks to reduce the need for imported grain for the swine industry

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 202 - Plant Genetic Resources
- 205 - Plant Management Systems

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 8

1. Outcome Target

Researchers work to develop a Staphylococcus aureus vaccine that will protect cows against a common bacterial infection that leads to mastitis and reduced milk production.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 315 - Animal Welfare/Well-Being and Protection

4. Associated Institute Type(s)

- 1862 Research

Outcome # 9

1. Outcome Target

Edamame research explores suitability of new cash crop for Soutside Virginia

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 205 - Plant Management Systems

4. Associated Institute Type(s)

- 1890 Research

Outcome # 10

1. Outcome Target

Researchers explore native bee potential for orchard pollination

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 205 - Plant Management Systems
- 211 - Insects, Mites, and Other Arthropods Affecting Plants

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

Description

The gross income derived from farming could be affected by natural disasters, changes in the economy, government regulations and public policy changes. Disasters damage infrastructure and facilities while economic and governance changes influence profitability of production systems. The number of acres of land subject to nutrient management plans/best management practices/conservation plans affected by government regulations and changes in the economy. If greater emphasis is placed on water and environmental quality then even more widespread implementation of these practices will be encouraged. These factors may have immediate impact as they significantly influence items such as production economics, industry infrastructure, marketing systems, and consumer demand. Good economic conditions encourage consumption of value added products. In Virginia, increasing land values in traditional animal production areas around cities and growing towns are a significant challenge. The recent increase in ethanol production and anticipated future growth of this alternative fuel source will likely have major impacts on livestock production practices in Virginia. Scope of such impacts is unknown, but anticipated direction has influenced this planned program.

A recent challenge has been the change in demographics in Virginia. There is an increased demand to offer education resources in Spanish. Employers have a desire to employ non-English speaking workers. The prohibitive, besides the lack of resources to change the training materials and examinations, is that most materials use in Virginia (and most states) are written in English only. Changes in global food production capacity, energy costs, and epidemic diseases could have unpredictable effects. All external factors affecting personal discretionary spending will affect the implementation of environmentally sound BMP's. Natural disasters may affect producers directly but also will affect ag producers, homeowner and commercial landscaping. The general economy, public policy and governmental regulations impact production and sales of horticultural products. Appropriations and competing programmatic challenges affect the dedication of personnel and programs to the described programs. Population changes affect supply and demand for horticultural products.

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

Participants in conferences, workshops and field days will evaluate the planned educational programs. Case studies will be conducted among selected vegetable growers, livestock farmers, and grain farmers who have established progress to measure their production success and their economic success. The data collected from Agriculture Statistics will provide information about numbers. Evaluation studies will include analysis of research output, programmatic progress and appropriate outreach.

The annual number of educators and farmers trained in best management practices will be collected and tabulated. The annual amount of land subject to nutrient management and other best management practices will be collected from the Virginia Department of Conservation and Recreation and tabulated.

Data collection methods will vary by local program and variation and innovation in methods used to determine program impact are encouraged. Program successes will be evaluated using clientele surveys, input from key stakeholder groups, and monitoring hotlines and web sites.

Program evaluations are conducted for knowledge based programs before and after the program. Behavior or attitude-based programs are evaluated post program on intentions or on follow-up surveys to evaluate implementation. Case studies are used to evaluate implementation of programs.

V(A). Planned Program (Summary)

Program # 2

1. Name of the Planned Program

Biotechnology, Biomaterials, and Energy

2. Brief summary about Planned Program

Our efforts in Biotechnology, Biomaterials, and Energy seeks to conduct research and extension programming that educates and explores issues related to energy efficiency and renewable energy systems. This program includes laboratory research, development of pilot scale projects in the field, educating clientele on the merits of particular energy practices, aspects of project analysis,, and engaging the private sector to spur the commercialization and economic development of innovative and efficient energy systems.

Advances in molecular genetics continually transforms our understanding of life sciences and, consequently, the methods utilized to produce food and fiber and to treat illness. Many pre-college curricula now incorporate concepts in genetics, genomics, and biotechnology. Individuals must make biotechnology-related decisions on a regular basis, from what foods to eat to what health care to utilize. As biological molecules, cells, and organisms become easier to manipulate and produce, individuals will increasingly need to choose whether and how they use these "products" of life science. Thus, the public needs opportunities, resources, and skills to consider the applications and implications of biotechnologies and scientists need continued and expanded mechanisms for communicating current research to non-technical audiences.

VAES researchers utilize biotechnological methods in disease diagnosis and monitoring, metabolic engineering for bioenergy, plant breeding and multiple other initiatives. Genomics and proteonomics provide the tools to identify the molecular basis of plant disease resistance, develop improved bioenergy crops, explore mechanisms involved in disease vectoring and to explore numerous plant, animal and human health issues.

3. Program existence : Mature (More than 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
112	Watershed Protection and Management	20%	0%	15%	0%
124	Urban Forestry	5%	0%	0%	0%
132	Weather and Climate	5%	0%	0%	0%
201	Plant Genome, Genetics, and Genetic Mechanisms	0%	0%	20%	0%
202	Plant Genetic Resources	2%	0%	10%	0%
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants	10%	0%	5%	0%
206	Basic Plant Biology	5%	0%	5%	20%
402	Engineering Systems and Equipment	10%	0%	20%	20%
403	Waste Disposal, Recycling, and Reuse	11%	0%	0%	0%
511	New and Improved Non-Food Products and Processes	15%	0%	20%	60%
601	Economics of Agricultural Production and Farm Management	10%	0%	5%	0%
605	Natural Resource and Environmental Economics	7%	0%	0%	0%
	Total	100%	0%	100%	100%

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

1. Situation and priorities

Due to rising energy prices, climate change, and energy security issues, many citizens are concerned that our nation has become too dependent on foreign sources of petroleum and are troubled by the impacts that this dependence has created. In response to these issues, the federal government recently signed into law the Renewable Fuels, Consumer Protection, and Energy Efficiency Act of 2007. This Act seeks to move the United States toward greater energy independence and security and promote the production of renewable fuels. Additionally, the Commonwealth announced in the 2007 Virginia Energy Plan a nonbinding goal of reducing statewide carbon dioxide emissions 30% by the year 2025. These policies are indicative of a broader interest to sustainably increase our energy independence while mitigating climate change. Virginians are particularly interested in evaluating the use of residual biomass as an integral component to future renewable energy production. Agricultural operations in Virginia are facing substantial structural changes and challenges due to rapid urbanization, intensified competition, and increased environmental regulation.

Finding a novel way to utilize the byproducts created from agriculture and other sources has the potential to convert waste streams into revenue streams. This potential can be realized through developing new value-added products such as biofuels, bioenergy, biopolymers, compost, functional foods, and pharmaceuticals.

For generations American farmers have led the world in producing food, feed and fiber. Now, for a variety of reasons, farmers are also being asked to produce fuel for our nation. Faculty from Virginia Tech and Virginia Cooperative Extension explore opportunities to enhance sustainable energy. A critical component to this systems based approach to bioenergy development is to better understand feedstock production from the farmers' perspective. The reliable sourcing of a continuous supply of feedstock to feed a biorefinery is also a key concern, not just the adjacency to rail lines or adequate water supplies.

Conversely, farms are not without ongoing economic challenges and seek innovative ways to remain viable and maintain the competitive advantage. New technologies, products, and markets are being developed to create new sources of revenue critical to fortifying the existing multi-million dollar farming industry. Virginia farmers spent nearly \$210 million dollars in energy related production expenses. For decades, farmers have realized higher yields per acre because of increased crop production efficiency resulting in economic benefits for the farmer, the agricultural community, and world population. Today, it is equally critical for farmers to increase production while minimizing energy inputs. Implementing energy efficiency technologies will reduce costs and increase farm profitability. For example, a 10% increase in energy efficiency, without affecting crop yield, would have produced nearly \$21 million in additional revenue to Virginia farmers.

Feeds comprise a major cost of livestock, poultry and aquaculture production. The development of feeds is a drawn out process of trials, measuring the suitability of feeds using measures such as growth and feed efficiency. New technical developments will allow measurement of animal response to feeds at the morphological, physiological, and gene expression levels, thereby greatly enhancing the development of feeds promoting the survival, growth, and well-being of food animals of agricultural and aquacultural importance. Many of the genes that play important roles in growth and reproduction in livestock and poultry species are unknown. The recent sequencing of the chicken, pig, and cattle genomes provides the raw data for the identification of many of these genes using genomics and bioinformatics approaches. By knowing the function of these genes, basic physiological mechanisms can be better understood, which will lead to improved production of food animals. Developments in molecular genetics, population genetic and phylogenetic inference, and conservation theory support definition of evolutionarily significant units, providing a basis for rational and defensible decision making for management of imperiled species. Forest plantations will prove more productive when tree genomes and ecological conditions are managed to promote efficient tree growth. High throughput screening is essential in biotechnology applications to crop improvement. Gene discovery is one of the most important objectives in genomics research in agricultural biotechnology. The recent availability of enormous DNA sequence information coupled with the latest developments in engineering applications to biological instrumentation (lasers, robotics), have created a golden opportunity to address limitations of both high throughput screening and gene discovery programs. This opportunity has further come to light with the development of DNA chip or DNA microarray technology. This state of the art technology is a powerful and revolutionary analytical method enabling us to study global gene expression of tens of thousands of genes simultaneously rather than the one gene at a time approach. Learning about biotechnology will give high school students the opportunity to better understand and critically evaluate the issues that are arising as a result of these new agricultural, medical, and environmental technologies. Equally important is the preparation of a future workforce. As of 2003, there were 1,473 biotechnology companies creating agricultural, medical, environmental, and computational products in the U.S., employing 198,000 people (Biotechnology Industry Organization, 2005). The industry reached a market capitalization of \$311 billion by spring of 2005. In addition, biotechnology is one of the most research intensive industries in the world, spending \$17.9 billion on research and development in 2003. The demands of our changing economy and workplace require a workforce with a deeper understanding of biotechnology and scientific research.

2. Scope of the Program

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

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

1. Assumptions made for the Program

To move toward a more sustainable energy system will require more research and extension programming. Research must focus on increasing energy use efficiency, design of energy efficient systems/units/utilities, improved feedstock cultivation, efficient harvesting and storage of biomass, network analysis to optimize logistics and minimize delivery costs, development of genetically enhanced and engineered plant materials, exploration of the consequences of specific policy initiatives, and other aspects critical to the development, design, and deployment of sustainable energy systems. Extension efforts must focus on the development of programming and materials to inform the public of the new research efforts based on facts discovered and also inform the researchers of the needs of the public to direct their investigations. Extension work should also direct more efforts on energy conservation education. The Land Grant system is uniquely positioned to facilitate the high level of iterative communication between Research and Extension that is required to develop sustainable energy systems, such as: biomass used for biofuels, design of optimum forestry practices and crops for bioenergy production, and the production of value-added bio-based industrial products and materials.

We assume funding will remain constant or increase. Bioinformatics, genomics, and biotechnology approaches can be implemented broadly across disciplines such as plants, animals, microbes, the environment, and human health. Important to the future application of these approaches and knowledge is a basic understanding of the technologies, benefits, and risks. High school students in Virginia and across the country will continue to take a year-long biology course. End-of-course testing will continue to include assessments of student knowledge about genetics and scientific inquiry.

2. Ultimate goal(s) of this Program

This program will work to promote energy efficient systems, renewable energy production, and evaluate policy effectiveness to promoting sustainable domestic energy generation to increase the economic competitiveness and long-term sustainability of Virginia production systems. Our goals are also to discover, develop, and disseminate knowledge promoting the sustainability of living natural resources and agricultural systems, particularly as impacted by bioinformatics, genomics and biotechnological approaches. We work to expand understanding of the applications and implications of genetics, genomics, and biotechnology.

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

Year	Extension		Research	
	1862	1890	1862	1890
2015	3.2	1.0	4.5	1.0
2016	3.2	1.0	4.7	1.0
2017	3.2	1.0	5.0	1.0
2018	3.3	2.0	5.1	1.0
2019	3.4	2.0	5.2	1.0

V(F). Planned Program (Activity)

1. Activity for the Program

The Sustainable Energy program includes laboratory research, development of pilot scale projects in the field, educating clientele on the merits of particular energy practices and conversion technologies, and engaging the private sector to spur the commercialization and economic development of innovative and efficient energy systems. Specific examples of activity areas of this program are listed below:

- * Develop biomass use for biofuels
 - * Designing optimum forestry and crops for bioenergy production.
 - * Produce value-added bio-based industrial products.
 - * Logistics/material handling
 - * Processing and management of end use waste products and byproducts
 - * Analysis of the global impacts of new generation biofuels
 - * Demonstration and commercialization of technologies that increase US energy independence
 - * Development of programs to train students and current county educators (in-service) to meet the new sustainable energy challenges.
 - * Energy conservation
 - * Alternative energy
 - * Understanding agricultural energy use and opportunities for conservation
 - * Smart and sustainable energy systems for communities
 - * Understanding the cost differences of energy usage
 - * Public outreach and engagement around energy public policy development
 - * Youth development programs to teach energy conservation, alternative energy sources, electricity and recycling.
- Clean energy project analysis via RETScreen

Processes of research studies, dissemination of research results, papers and citations, commercialization of techniques and products, conduct research experiments, conduct workshops, meetings, develop products, resources, work with media and establish and sustain partnerships.

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

Extension	
Direct Methods	Indirect Methods

<ul style="list-style-type: none">• Education Class• Workshop• Group Discussion• One-on-One Intervention• Demonstrations	<ul style="list-style-type: none">• Public Service Announcement• Newsletters• TV Media Programs• Web sites other than eXtension• Other 1 (UTube)
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3. Description of targeted audience

- Farmers
- Citizens
- Agency personnel
- Economic developers
- Regional planners
- Commercial Producers
- Land Owners
- 4-H Youth
- K-12 Youth
- State and Federal Agency Personnel
- Extension Educators
- Policy Makers
- Consumers
- Ag Related Businesses
- Energy Service Companies (ESCOs)
- Research scientists, government officials, high school teachers, 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 educational meetings, workshops, conferences, training sessions, demonstrations and field days
- Number of fact sheets, publications, newsletters, and other print resources
- Number of peer reviewed journal articles.
- The amount of competitive grant funding received.
- 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	Increase farm profitability due to more energy efficient practices
2	Increase adoption of sustainable energy conversion technologies
3	Increase program participants understanding of raw material conversion and modern business management practices.
4	Researchers develop novel switchgrass germplasm with higher biomass potentials, suitable for large scale and sustainable biomass production in Virginia
5	Researchers are developing better microbial systems for the production of bio-fuel, more effective therapeutics and vaccines for TB, and for facilitating better nutrient utilization in ruminants.

Outcome # 1

1. Outcome Target

Increase farm profitability due to more energy efficient practices

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 402 - Engineering Systems and Equipment
- 601 - Economics of Agricultural Production and Farm Management

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Research

Outcome # 2

1. Outcome Target

Increase adoption of sustainable energy conversion technologies

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 402 - Engineering Systems and Equipment

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 3

1. Outcome Target

Increase program participants understanding of raw material conversion and modern business management practices.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 402 - Engineering Systems and Equipment

- 511 - New and Improved Non-Food Products and Processes
- 605 - Natural Resource and Environmental Economics

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 4

1. Outcome Target

Researchers develop novel switchgrass germplasm with higher biomass potentials, suitable for large scale and sustainable biomass production in Virginia

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 201 - Plant Genome, Genetics, and Genetic Mechanisms

4. Associated Institute Type(s)

- 1862 Research

Outcome # 5

1. Outcome Target

Researchers are developing better microbial systems for the production of bio-fuel, more effective therapeutics and vaccines for TB, and for facilitating better nutrient utilization in ruminants.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 201 - Plant Genome, Genetics, and Genetic Mechanisms

4. Associated Institute Type(s)

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

Description

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

Evaluation results are indicated within each impact statement for each state defined outcome.

V(A). Planned Program (Summary)

Program # 3

1. Name of the Planned Program

Community Viability

2. Brief summary about Planned Program

Virginia small business are undergoing dramatic change as business integration accelerates, traditional markets disappear, and trade, commodity, and environmental policies provide both new constraints on, and opportunities for business profits. Virginia businesses find themselves forced to manage new sources of business risk, and find that known risks are more volatile than ever before. For small businesses, rapidly changing consumer demands, high costs of labor and health care, and increased imports of lower costs goods all contribute increased business risk and a cost price squeeze, resulting in reduced profitability. Small businesses are looking for products and services to fill niches that both meet consumers' needs and provide for a profitable business plan.

Communities and community development organizations are seeking programs and approaches that strengthen local economies, enhance overall community resilience, and build capacity.

Equipping local leaders, aspiring leaders, and engaged community members with the skills and tools needed to effectively lead their communities affords the opportunity for communities to build on local strengths. VCE recognizes that strengthening the leadership and civic capacity of communities requires preparing more citizens to serve in leadership roles, engaging citizens in public issues education, and strengthening civic engagement skills and knowledge while increasing opportunities for civic involvement.

3. Program existence : Mature (More than 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
602	Business Management, Finance, and Taxation	10%	0%	10%	0%
603	Market Economics	5%	0%	10%	0%
605	Natural Resource and Environmental Economics	5%	0%	15%	0%
607	Consumer Economics	25%	0%	15%	0%
608	Community Resource Planning and Development	20%	100%	15%	0%
610	Domestic Policy Analysis	5%	0%	5%	0%
801	Individual and Family Resource Management	25%	0%	20%	0%
804	Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures	5%	0%	10%	0%
	Total	100%	100%	100%	0%

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

1. Situation and priorities

There are many pressing social, economic, and environmental needs and issues facing communities. Participants identified concerns related to the quality of life within communities, namely workforce, economic, and leadership development; public service infrastructure; urban sprawl; and the ability to respond to emerging critical issues within local communities. Improved financial capability of agricultural and small businesses is critical for the long-term economic health of Virginia. Understanding business, financial, and risk management are the underlying principles for obtaining long-term financial security for individual entrepreneurs. Profitable and successful small businesses are the cornerstone of robust families and the communities in which they live.

Moreover, communities prosper from assistance in developing and strengthening local economies through entrepreneurship and small business development. This includes developing and delivering educational programming to improve capacity among community members to engage in community planning, decision-making, and community leadership for strengthening local and regional economies.

2. Scope of the Program

- In-State Extension
- Multistate Extension

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

1. Assumptions made for the Program

Communities also require information and resources on alternative economic development opportunities and strategies. A priority is to provide communities with assistance in building stronger, more resilient economies.

Equipping local leaders, aspiring leaders, and engaged community members with the skills and tools needed to effectively lead their communities affords the opportunity for communities to build on local strengths. VCE recognizes that strengthening the leadership and civic capacity of communities requires preparing more citizens to serve in leadership roles, engaging citizens in public issues education, and strengthening civic engagement skills and knowledge while increasing opportunities for civic involvement.

All children and families, and communities can grow and develop to realize their full potential. These groups are confronted with a multitude of issues that affect their well-being such as child and school-aged care, at-risk youth behaviors, strained family relationships, aging populations, poverty, and community leadership. Concerns about how Virginia's communities are functioning, adjusting, and adapting to these issues have economic impacts for the Commonwealth and are backed by VCE's community situation analysis results. Further, Extension programs have shown positive influences on the quality of community life. It is VCE's, VT's, and VSU's responsibility to continue to apply research, educate, and provide outreach services to insure best practices that create strong communities.

2. Ultimate goal(s) of this Program

The ultimate goal of the Community Viability Planned Program is to develop community resiliency and capacity to respond to locally based issues through:

1. Assisting communities in developing and strengthening local economies through entrepreneurship and small business development.
2. Developing and delivering educational programming to improve capacity among community members to engage in community planning, decision-making, and community leadership.

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
2015	35.6	1.0	0.0	0.0
2016	35.6	1.0	0.0	0.0
2017	34.3	1.5	0.0	0.0
2018	35.8	1.5	0.0	0.0
2019	36.6	2.0	0.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

To address the Community Viability planned program, we will:

1. Conduct workshops in leadership development, facilitation, conflict management, community planning, community resource development, entrepreneurial and alternative economic development.
2. Deliver services in facilitation strategic planning, public listening sessions, land use discussions for community viability/community resource development issues
3. Develop print and electronic resources in community viability/community resource development
4. Provide and distributed available resources, including eXtension, in land use, community planning, leadership, facilitation, small business development and alternative economic development
5. Provide professional development training in facilitation, land use and leadership
6. Partner with local, regional and state agencies, organizations, faith-based groups, etc.
7. Facilitate meetings of task forces, coalitions, committees, addressing community viability/community resource development issues
8. Conduct research on leadership development

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

Extension

Direct Methods	Indirect Methods
<ul style="list-style-type: none"> ● Education Class ● Workshop ● Group Discussion ● One-on-One Intervention ● Demonstrations 	<ul style="list-style-type: none"> ● Public Service Announcement ● Newsletters ● eXtension web sites ● Web sites other than eXtension

3. Description of targeted audience

Individuals, families, owners and managers of farms, and small businesses; local, state, and federal personnel and policy makers; community leaders and organizations; and private sector service suppliers are the targeted audiences.

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 education programs planned in public policy education
 - Number of communities and local governments partnering with Virginia Cooperative Extension faculty to seek and develop alternative economic development opportunities or address public policy and community planning goals.
 - The number of people completing in Master Financial Education Volunteer programs.
 - Number of trainings, educational workshops, and on-line education sessions held in planned program are for targeted audiences.
 - Number of fact sheets, publications, newspaper articles, and curricula on community viability
 - Number of participants who report new leadership roles and opportunities undertaken
 - Number of plans adopted or implemented in business or community planning
 - Number of civic engagement events held
 - Number of businesses created, attracted, retained or expanded due to Extension program
- 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	Entrepreneurship - Increase the number of trained volunteers and citizens participating in Extension entrepreneurship workshops indicating increased entrepreneurial knowledge and skills applied to evaluation and planning of new enterprises (such as small businesses, micro-businesses, home-based businesses and agri-tourism).
2	Alternative Economic Development/Community Planning - Increase the number of communities and local governments partnering with Virginia Cooperative Extension faculty that seek and develop alternative economic development opportunities, and community planning goals.
3	Economic and Community Planning- Increase in self-reported preparedness among communities receiving economic development and community planning education
4	Facilitation Skills Training - Increase the percentage of trained volunteers and citizens participating in facilitation skills training that indicate improved knowledge and skills as a result of participation.
5	Leadership Development Education - Increase the percentage of adult citizens participating in leadership development education programs that indicate improved knowledge and skills as a result of participation.

Outcome # 1

1. Outcome Target

Entrepreneurship - Increase the number of trained volunteers and citizens participating in Extension entrepreneurship workshops indicating increased entrepreneurial knowledge and skills applied to evaluation and planning of new enterprises (such as small businesses, micro-businesses, home-based businesses and agri-tourism).

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 602 - Business Management, Finance, and Taxation
- 608 - Community Resource Planning and Development

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension

Outcome # 2

1. Outcome Target

Alternative Economic Development/Community Planning - Increase the number of communities and local governments partnering with Virginia Cooperative Extension faculty that seek and develop alternative economic development opportunities, and community planning goals.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 602 - Business Management, Finance, and Taxation
- 608 - Community Resource Planning and Development

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 3

1. Outcome Target

Economic and Community Planning- Increase in self-reported preparedness among communities receiving economic development and community planning education

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 608 - Community Resource Planning and Development

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

Outcome # 4

1. Outcome Target

Facilitation Skills Training - Increase the percentage of trained volunteers and citizens participating in facilitation skills training that indicate improved knowledge and skills as a result of participation.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 608 - Community Resource Planning and Development

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

Outcome # 5

1. Outcome Target

Leadership Development Education - Increase the percentage of adult citizens participating in leadership development education programs that indicate improved knowledge and skills as a result of participation.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 608 - Community Resource Planning and Development

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

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.)
- Other (Lost of county educators)

Description

All items listed above directly affect communities and all forms of businesses (i.e., droughts, floods, and changes in government policy can lead to dramatic shifts in the structure of an industry) and reduce family assets and lost wages due to business closings. These changes may be short-lived (flood) or may cause structural changes to a community and the livelihood of its citizens. They may also hinder citizens from engaging in volunteer and leadership roles due to shrinking personal financial resources and time.

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

Educational programs will be formally evaluated with a post program questionnaire. As funds permit additional formal evaluations will be conducted to demonstrate the degree of adoption of behavior change.

V(A). Planned Program (Summary)

Program # 4

1. Name of the Planned Program

Food, Nutrition, and Health

2. Brief summary about Planned Program

Food, nutrition, and health - Recent data show that 66% of adults are overweight. Overweight and obesity increase the risk for several health conditions as well as chronic diseases, such as heart disease and diabetes. In Virginia alone, these two diseases account for over \$4 billion in health care costs. Furthermore, it has been reported that families of low socioeconomic status suffer disproportionately from poor health. They experience a higher incidence of high blood pressure, cholesterol, stroke, obesity, and diabetes. In Virginia, participation in the Supplemental Nutrition Assistance Program (SNAP) has increased over the past few years, with the economic downturn. Presently, there are two nutrition education programs that address impoverished citizens: The Expanded Food and Nutrition Education Program (EFNEP) and the Supplemental Nutrition Assistance Program (SNAP-ED) Education Program.

Effective research initiatives and educational strategies are warranted to reduce the rate of adult overweight and lifestyle-related chronic diseases. Virginia Cooperative Extension aims to develop, implement, and evaluate integrated research-based community programs to improve dietary habits and increase physical activity. Research into the social contributions of improved health status will also be conducted, including developing a more complete understanding of obesity from its root causes to its association with disease. Program delivery methods will be driven by local needs and socio-demographic characteristics of respective communities, including: classes, workshops, trainings, one-on-one interventions, demonstrations, PSA's, newsletters, and websites. Future efforts will build on existing collaborations and programs pertaining to adult nutrition, health, fitness and overall wellness, and chronic disease prevention and management. with outcomes reflecting the goals and objectives of these programs. Evaluation studies will use a wide range of methods, depending on local needs and resources.

Vector-borne diseases and public health pests - The common bed bug is rapidly increasing its economic significance as a structural pest in Virginia and throughout the United States. The number of reported infestations in single family homes, hotel rooms, and multi-unit housing has increased 10-100 fold every year since 1990. Although the exact economic consequences of the U.S. bed bug resurgence are still unknown, they are thought to be considerable. So far the economic impacts resulting from of bed bug infestations include not only the cost of professional pest control service, but the loss of revenue from hotels and apartments that cannot be rented, replacement of infested furniture, occupant medical bills, bad publicity and reputation damage for the hospitality industry, and thousands of lawsuits naming hotels and housing authorities as the defendants. Feiden (2007) reports that at the end of the fiscal year in 2006, 6,889 bed bug infestation complaints were recorded by the New York City Department of Housing, Preservation and Development (HDP), and 2,008 building owners were presented with summonses. Bed bug lawsuits have resulted in millions of dollars being spent to settle litigation settlements over the last several years.

As a group arboviral diseases are the cause of unacceptable levels of morbidity and mortality in humans and domesticated animals, and as such are a tremendous economic and health burden. More than one million human lives are lost each year from malaria, dengue, yellow fever, and other infectious diseases transmitted by mosquitoes. Because of growing insecticide resistance, climate change, increased air transportation, and the ability of mosquitoes to quickly adapt to new habitats, the public-health burden of vector-borne diseases is increasing and expanding globally. This recent change in a global situation represents a threat to public health and welfare of the Commonwealth of Virginia.

Novel research and educational programming, such as workshops/trainings, are warranted to better understand the genetic and molecular mechanisms involved in bed bugs and vector-borne diseases. Future initiatives will build upon past research and partnerships to build a more solid foundation of knowledge to be translated for public health benefits.

Over the past 30 years the number of overweight children and teens has nearly tripled. Nearly one in three children in the U.S. between the ages of 6 and 19 is overweight or obese. The obesity epidemic presents a major public health challenge to families, parents, schools, health care professionals, and communities as a whole. Both formal and informal programs offer valuable access to children of all ages and their parents, and caregivers. Head start and other day care providers and grades K-12 provide access to children and youth on a daily basis with on-going opportunities for nutrition and health education to prevent the development and provide targeted intervention to address childhood obesity. School and preschool breakfast and lunch not only provide healthy food but also model appropriate meals and snacks. Nutrition and health education can be a part of the formal school curriculum meeting Standards of Learning in science and health and also be included in after-school and recreational summer and winter youth activities. Social marketing campaigns to reinforce healthy eating and physical activity messages are also critical. Training for preschool and K-12 teachers, school nutrition directors and staff, and school wellness committee members, along with presentations, printed and media materials for parents are comprehensive strategies to combat childhood obesity.

Virginia Cooperative Extension will implement the Family Nutrition Program which is comprised of the Expanded Food and Nutrition Education Program (EFNEP) and the Supplemental Nutrition Assistance Program - Education (SNAP-Ed). The mission of the two programs is to promote healthy eating habits, food safety habits, extend food resources, and increase physical activity. Upon completion of the comprehensive program, participants will be assessed on dietary behavior change, food resource management behavior change, and food safety behavior change. One key component will be the assessment of participants' food security status upon completion of the nutrition comprehensive program.

Foodborne illness or food safety presents another major health concern among Virginian citizens. Foodborne disease is caused by ingesting contaminated foods or beverages. Many different disease-causing microbes or pathogens can contaminate foods. There are an estimated 48 million illnesses, 128,000 hospitalizations, and 3,000 deaths each year associated with food microorganisms. From 2000 to 2006 Virginia averaged 17 confirmed foodborne outbreaks per year. Long-term, chronic illness may also be attributed to foodborne contaminants, although the specific costs and impacts are unknown. Most foodborne outbreaks are linked to improper food handling by retail outlets or consumers in their homes. Each year, food processors add approximately \$8 billion to the value of agricultural food products processed in the Commonwealth. Over 500 food processing firms are headquartered and operate within the state. Virginia food producers and processors need to continuously improve their products and processes to remain competitive and maintain high safety standards. The HACCP system has been supported by the National Academy of Science, the U.S. Food and Drug Administration and USDA to prevent food production and processing deficiencies that could be potentially harmful to the consumer. HACCP helps the food processor assure final products meet all safety criteria. The intent of HACCP is to identify those points critical to food safety in the processing flow and adequately control them. It is important to train local, state, and federal food inspectors in the HACCP concept and current food safety issues.

Food availability, accessibility, affordability and the overall health of the food system are inextricably linked to land use, human health, rural and urban economies, and family and community health. Virginia Cooperative Extension has used multi-faceted extension programming to develop more locally-integrated community-based food systems to address current and emerging relevant societal issues that positively and directly affect food security, food access, hunger, public health, education, farm sustainability,

community development, rural economic

3. Program existence : Mature (More than 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
112	Watershed Protection and Management	2%	0%	0%	0%
305	Animal Physiological Processes	0%	0%	10%	0%
501	New and Improved Food Processing Technologies	3%	0%	10%	0%
502	New and Improved Food Products	5%	0%	10%	0%
604	Marketing and Distribution Practices	5%	0%	5%	0%
701	Nutrient Composition of Food	0%	15%	0%	0%
702	Requirements and Function of Nutrients and Other Food Components	5%	15%	10%	100%
703	Nutrition Education and Behavior	36%	50%	0%	0%
704	Nutrition and Hunger in the Population	2%	20%	0%	0%
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	0%	0%	15%	0%
721	Insects and Other Pests Affecting Humans	2%	0%	20%	0%
723	Hazards to Human Health and Safety	10%	0%	15%	0%
724	Healthy Lifestyle	30%	0%	5%	0%
	Total	100%	100%	100%	100%

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

1. Situation and priorities

Chronic diseases such as heart disease, stroke, cancer, and diabetes are among the most prevalent, costly, and preventable of all health problems. Seven of ten deaths each year in the U.S. are attributed to chronic disease. The prolonged illness and disability associated with these diseases also decreases the quality of life for millions of Americans and in Virginia alone cardiovascular disease and diabetes account for over \$4 billion in health care costs. Much of this burden is preventable, since unhealthy eating and physical inactivity are major contributors to these diseases, along with other conditions, such as high blood

pressure, high cholesterol, and overweight.

Vector-borne diseases and public health pests - The common bed bug is rapidly increasing its economic significance as a structural pest in Virginia and throughout the United States. The number of reported infestations in single family homes, hotel rooms, and multi-unit housing has increased 10-100 fold every year since 1990. Although the exact economic consequences of the U.S. bed bug resurgence are still unknown, they are thought to be considerable. So far the economic impacts resulting from bed bug infestations include not only the cost of professional pest control service, but the loss of revenue from hotels and apartments that cannot be rented, replacement of infested furniture, occupant medical bills, bad publicity and reputation damage for the hospitality industry, and thousands of lawsuits naming hotels and housing authorities as the defendants. Feiden (2007) reports that at the end of the fiscal year in 2006, 6,889 bed bug infestation complaints were recorded by the New York City Department of Housing, Preservation and Development (HDP), and 2,008 building owners were presented with summonses. Bed bug lawsuits have resulted in millions of dollars being spent to settle litigation settlements over the last several years.

As a group arboviral diseases are the cause of unacceptable levels of morbidity and mortality in humans and domesticated animals, and as such are a tremendous economic and health burden. More than one million human lives are lost each year from malaria, dengue, yellow fever, and other infectious diseases transmitted by mosquitoes. Because of growing insecticide resistance, climate change, increased air transportation, and the ability of mosquitoes to quickly adapt to new habitats, the public-health burden of vector-borne diseases is increasing and expanding globally. This recent change in a global situation represents a threat to public health and welfare of the Commonwealth of Virginia.

Foodborne illness or food safety presents another major health concern among Virginian citizens. Foodborne disease is caused by ingesting contaminated foods or beverages. Many different disease-causing microbes or pathogens can contaminate foods. There are an estimated 48 million illnesses, 128,000 hospitalizations, and 3,000 deaths each year associated with food microorganisms. From 2000 to 2006 Virginia averaged 17 confirmed foodborne outbreaks per year. Long-term, chronic illness may also be attributed to foodborne contaminants, although the specific costs and impacts are unknown. Most foodborne outbreaks are linked to improper food handling by retail outlets or consumers in their homes. Each year, food processors add approximately \$8 billion to the value of agricultural food products processed in the Commonwealth. Over 500 food processing firms are headquartered and operate within the state. Virginia food producers and processors need to continuously improve their products and processes to remain competitive and maintain high safety standards. The HACCP system has been supported by the National Academy of Science, the U.S. Food and Drug Administration and USDA to prevent food production and processing deficiencies that could be potentially harmful to the consumer. HACCP helps the food processor assure final products meet all safety criteria. The intent of HACCP is to identify those points critical to food safety in the processing flow and adequately control them. It is important to train local, state, and federal food inspectors in the HACCP concept and current food safety issues.

The growing number of overweight and obese preschool, school age, and teenage children continue to challenge our society and its resources. Childhood obesity has both physical and emotional consequences. Overweight and obese children are more likely to have high blood pressure and high blood cholesterol, conditions previously associated with middle age adults. The growing numbers of children with type 2 diabetes has been attributed to obesity and overweight and obese children are likely to continue to be overweight or obese as adults. For the first time in history many children will have lower life expectancies than their parents. Large children also report lower self-esteem, sadness, feelings of isolation and an overall lower quality of life than healthy weight children. Obesity is also costly adding to long term health care expenditures. A report from Kaiser Permanente indicated an overweight child is likely to participate in more primary care sick visits and mental health-related visits over a 1-year period than a healthy-weight child, at an additional annual cost of approximately \$72 (sick plus mental health

visits). A 2007 study reported that 70 percent of obese young people already had at least one additional risk factor for cardiovascular disease, while 39 percent had at least two additional risk factors. The number of hospitalizations of kids and teens, ages 2 to 19, with a primary or secondary diagnosis of obesity nearly doubled between 1999 and 2005, climbing from 21,743 to 42,429. FCS agents, 4-H agents, and staff of the Family Nutrition Program will increase the number of preschool and K-12 children reached with nutrition and health education with an emphasis on healthy weight. Current curricula including Organwise, LEAP, Food Friends and Mighty Moves, and I am Moving, I am Learning, directed toward preschool audiences, and Organwise and Healthy Weights for Healthy Kids used in middle school, form the basis for current teaching. By providing training for both preschool and K-12 teachers, the impact on Virginia youth can be expanded beyond what might be accomplished by FCS and 4-H agents and the Family Nutrition Program alone. The curricula noted above emphasize healthy eating, regular and sustained physical activity, and appropriate attitudes toward food, eating, and body weight. Concentrated efforts will be directed toward reaching parents who must be allies with school and health professionals in combating childhood obesity. Cooperation with parent-teacher groups, the faith-based community, and preschool child and Head Start programs provide access to parents for distribution of printed materials as well as face-to-face presentations and food-related activities with their children.

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

Health promotion and chronic disease reduction is dependent on lifestyle practices that emphasize self-care, healthy eating, and regular physical activity. Disease prevention education must provide consumers with tools to assess their current behavior and make changes if needed. Intervention strategies such as the transtheoretical stages of change help consumers assess their risk, consider alternative behaviors, and take action. Small changes over time are more easily implemented and more likely to be continued than drastic changes in food or activity patterns. Existing curriculum appropriate for older adults can be implemented at senior centers and congregate meal sites. Partnerships joining Extension, the Virginia Department of Health, and other health care professionals can provide hands on learning in appropriate food selection and preparation practices to assist persons with diabetes in effectively managing their disease.

Childhood Obesity: * Effective strategies to prevent childhood obesity must begin in early childhood as young children are forming their food and activity habits that will endure for their lifetime. Reinforcement of patterns of healthy eating and lifestyle practices must continue through the school years with appropriate age-related teaching that addresses new patterns of choice and growing independence. * Nutrition and activity education must allow for individual differences, food preferences, and cultural and

ethnic characteristics. Messages must be simple and achievable within the individual's social, economic, and community setting. * Parents must be involved at all levels to provide a supportive and learning environment to develop not only healthy eating and physical activity habits, but also appropriate attitudes toward food and body size. * Curricula for teaching both children and parents must reflect the Experiential Learning Model

incorporating hands-on activities in group settings with opportunities for physical activity. * Extension educators will have the curricula, learning resources, and other supporting materials to provide quality programming. * Extension educators will engage organizational and community partners, including government, business, education, and community agencies, in collaborative efforts to prevent childhood obesity and encourage maintenance of healthy weights.

Virginia consumers and food processors need science-based information and education about efficient, safe processing, handling, and preservation of food to minimize the risk of foodborne illness. Educational programming must provide hands-on training to maximize retention of material. Food preparation and handling curriculum takes trainees through real world situations and helps them to work through problems associated with food preparation. Partnerships between VCE and the Virginia Department of Health promote maximum coverage of consumers and food service employees across the state. Research in the area of food safety will help identify potential risks for food borne illness and to suggest proper ways to minimize food contamination. Other areas of research include the development of appropriate diagnosis methods and appropriate processing parameters.

Family Nutrition Program: The first assumption is employing people indigenous to the target population provides rapport building which allows for the development of a trusting relationship, ultimately providing an increased likelihood of sustained behavior change. The second assumption is that the target population is frequently intimidated with the thought of being in an educational environment due to previous negative experiences in school. The third assumption is that the program is built on an experiential learning model, engaging participants in hands on learning, thereby increasing the likelihood for sustained behavior change. The fourth assumption is that most people believe they know nutrition and do not need lessons on

how to plan meals, prepare nutrient dense recipes, and have family meals.

Local Food Systems: Within this planned program, Virginia Cooperative Extension has assumed that to address food security and hunger through a more localized food system you have to increase the availability, access and consumption of healthy, whole fresh foods. Therefore, it is important to look at the local food system's value chain from pre-harvest, post-harvest, consumption and disposal. As part of this process, it is critical to evaluate what knowledge, education, research and policies may be lacking or be an obstacle for

improving community food security, food availability, and actual consumption all along the food value chain. To improve individual and community food security, food safety, diet and health through increasing

access availability and utilization of fresh nutritious foods, Extension's programming should include consumer education and training on food budgeting, healthy eating, and food safety. At the same time,

through Extension programming related business and production management, food system planning and

policy and market development, Extension has to address issues of awareness, convenience, supply,

access to land and capital, physical infrastructure needs of the local food system to improve affordable

access to more nutritious foods for all Virginia residents.

2. Ultimate goal(s) of this Program

To improve health as a result of better eating behaviors, increased physical activity, and other self-care practices 1. Adults will increase their intake of fruits, vegetables, whole grains, and low-fat calcium rich foods to meet the recommended number of servings each day, 2. Adults increase their level of physical activity to 150 minutes accumulated each week (or 30 minutes on at least 5 days per week), 3. Adults participate in regular health screenings to support early diagnosis and intervention for chronic disease, 4. Older adults adopt appropriate diet and activity behaviors to increase years of independent living, and 5. Individuals with diabetes adopt food and self-care practices that lower risk of disease complications and disability.

Childhood Obesity: The ultimate goal is to achieve optimum physical and emotional health in each of our nation's children. Excessive weight gain with the accumulation of inappropriate amounts of body fat, resulting in the clinical diagnosis of overweight or obesity, carries severe physical and emotional consequences. Overweight and obese children are more likely to be overweight or obese adults and even in childhood begin to undergo the physical changes leading to chronic disease and disability. At the other extreme, children and teens obsessed with the fear of gaining body weight and body fat can develop eating

disorders such as anorexia nervosa or bulimia in which they starve themselves to the point of death or

practice self-induced vomiting or other self-destructive behaviors. FCS curricula are designed to support

positive attitudes toward eating, food, and body image. Lessons emphasize individual differences in body

types and size, and reinforce the concept that appropriate amounts of healthy foods and getting the recommended amount of daily physical activity leads to a healthy body regardless of size. A focus on experiential learning helps children of all ages learn healthy patterns of eating.

Food Safety: Consumer and Producer Initiative: 1. Consumers increase their knowledge of food safety practices in the home, 2. Food handlers improve food safety and handling practices in restaurants, 3. Food processors and producers improve knowledge of HACCP practices, GAPs principles and current safety standards for food processing, 4. Consumers have more access to locally processed, nutritious, and safe food at reasonable costs, 5. Fewer foodborne illnesses and outbreaks are reported in Virginia, and 6. Virginia reports increased sales of Virginia Processed Foods.

Family Nutrition Program: The ultimate goals are to improve the health and well-being of limited resource audiences which will ultimately reduce the incidence of chronic diseases and decrease the incidence of food insecurity which will ultimately reduce the costs of health care.

Local Food Systems: The ultimate goal of this program is to improve individual and community food security for all residents of Virginia by looking at the local food system more holistically and comprehensively from the farm-to-table. This approach entails addressing current educational, research and policy obstacles, seizing available opportunities for improving food access, setting priorities education, training and overall local food system market development, and being cognizant of equity and justice issues as they related to food security.

With this comprehensive approach to food security and hunger, the program will also impact economic vitality, community viability, land protection and conservation, business incubation and expansion, health promotion, value chain development and enhancement, agricultural profitability and sustainability, and better prepare individuals and communities for contingencies and the future.

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
2015	43.2	4.0	24.1	4.0
2016	44.2	5.0	25.0	4.0
2017	44.2	5.0	26.7	4.0
2018	46.1	5.0	27.2	4.0
2019	47.1	6.0	27.7	4.0

V(F). Planned Program (Activity)

1. Activity for the Program

Food, nutrition, and health - Conduct educational classes, workshops, meetings, and trainings, develop products, curriculum, resources, facilitate coalitions and/or task forces, conduct assessments and community surveys, partner with community agencies and institutions to facilitate programs and community development, create/revise social systems and public policies, conduct research studies, disseminate program and research results through papers, reports, and media, develop and implement marketing strategies using various outlets to promote program participation, disseminate research-based information to consumers using a variety of media and technology resources, cooperate with media and other community agencies to seek effective means of reaching new and non-traditional audiences, and respond to consumer inquiries.

Vector-borne diseases and public health pests - Conduct research to further our understanding of vector-borne diseases caused by insects and pests, and disseminate science-based results to stakeholders through workshops, trainings, etc.

Food Safety: Conduct educational classes, workshops, meetings, and trainings, develop products, curriculum, resources, facilitate coalitions and/or task forces, conduct assessments and community surveys, partner with community agencies and institutions to facilitate programs and community development, create/revise social systems and public policies, conduct research studies, disseminate program and research results through papers, reports, and media, develop and implement marketing strategies using various outlets to promote program participation, disseminate research-based information to consumers using a variety of media and technology resources, cooperate with media and other community agencies to seek effective means of reaching new and non-traditional audiences, and respond to consumer inquiries.

Childhood obesity: Conduct educational classes, workshops, short courses, meetings, seminars, and trainings for children, parents, teachers, school food service workers, and health and other professional groups; develop curriculum, newsletters, and other educational resources; establish and implement train-the-trainer models to promote educational opportunities; facilitate local and statewide

coalitions and/or task

forces; conduct assessments and community surveys; partner with community agencies and institutions to

facilitate programs and community development; contribute to the creation/revision of social systems and

public policies; conduct research studies and disseminate program and research results to both the professional community and lay public through journal articles, papers, reports, and public media;

develop

and implement marketing strategies using various outlets to promote program participation and reinforce

other activities, with special attention to underserved and disadvantaged audiences; disseminate research based information to lay audiences and address emerging needs using a variety of media and innovative

technology resources; cooperate with media and other community agencies to seek effective means of

targeting new and non-traditional audiences; and respond to consumer inquiries. Programs will be behaviorally-focused and help facilitate children and youth meeting the current U.S. Dietary Guidelines for Americans. Recommendations include: A) consuming more healthy foods such as: vegetables, fruits, whole grains, fat-free or low-fat milk and milk products, seafood, lean meats and poultry, eggs, beans and peas, and nuts and seeds; B) consuming less foods/food components that are commonly eaten in excess such as: sodium, solid fats, added sugars, and refined grains; and C) following healthy eating patterns such as: eating breakfast, eating as a family, making healthy snack choices, etc. Activities include leadership, civic engagement, 4-H camping programs (overnight and day), 4-H after-school programs, 4-H in-school programs, 4-H school enrichment programs, 4-H clubs (community and military), 4-H special interest programs, 4-H Cloverbud groups, district 4-H trainings, local 4-H trainings, home school education, online education and distance learning, and specialized trainings and workshops to qualify instructors and to educate trainers.

Family Nutrition Program: Nutrition education will be taught to Virginia's Supplemental Nutrition Assistance Program (SNAP) participants and those eligible for SNAP. Participants completing the comprehensive programs will be assessed to determine that behavior change has been attained as well as increasing their food security levels. Nutrition education will be provided to EFNEP youth and adults and those who are up to 185% of the Federal Poverty guidelines. Participants completing the comprehensive programs will be assessed to determine that behavior change has been attained as well as increasing their food security levels. Youth participants will receive either SNAP-Ed or EFNEP lessons according to policy and

procedures across Virginia.

Local Food Systems: Conduct consumer education workshops and training on food budgeting, the cost effectiveness of local and regional foods, healthy eating and cooking skills.

- Conduct educational programs on crop and livestock production specific to local marketing channels
- Conduct research on the social, economic and environmental impacts of local or regional food system to communities.

- Conduct research on local or regional food system impact on the dietary and health of consumers
- Encourage collaboration and partnerships to improve food availability, food access, and

consumption

of fresh, nutritious local foods

- Provide educational programming on whole farm planning, resource management planning, marketing, food safety, and other educational needs to improve supply and availability of local foods.

- Develop and conduct a Virginia food system assessment and

- Continue to implement the Virginia Farm-to-Table Plan

- Organize and conduct, local regional and state conferences

Specialty Foods: Assist small business and producers to develop and market value-added agricultural food products.

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

Extension	
Direct Methods	Indirect Methods
<ul style="list-style-type: none"> ● Education Class ● Workshop ● Group Discussion ● One-on-One Intervention ● Demonstrations ● Other 1 (e-mail, telephone) ● Other 2 (health fairs, events, certificat) 	<ul style="list-style-type: none"> ● Public Service Announcement ● Newsletters ● TV Media Programs ● Web sites other than eXtension ● Other 1 (TV, radio, newspaper)

3. Description of targeted audience

Food, nutrition, and health - Young adults (ages 18 to 59), older adults (age 60 and older), caregivers of older adults, adults with type 2 diabetes, parents and caregivers of individuals with type 2 diabetes, senior center and meal site staff and volunteers, and Extension educators.

Vector-borne diseases and public health pests - Researchers, public health agencies, schools, institutions, Extension educators

Food safety education's target audience includes retail and food service employees, retail and food service management, temporary food vendors, child care providers, young adults (ages 25-59), older adults (ages 60 and older), Extension educators, other researchers, policy makers, commercial food processors, and fresh produce producers.

Childhood Obesity: young children (ages 2 - 5 years); school-age children; adolescents; parents, foster parents, grandparents; caregivers (in-home and for-profit day care providers); teachers, 4-H volunteers and other school faculty for young children, youth, and adolescents; school nutrition directors and staff; school wellness committees; school nurses and other health care providers; and Extension educators.

Family Nutrition Program: The target population is comprised of people who are SNAP and WIC participants as well as those who are eligible to participate in those programs. The youth participants attend schools that have a high percentage of students (>50% Free and Reduced lunch schools) participating in the Free and

Reduced Lunch program. People who have income levels more than 185% of the federal poverty guidelines are not enrolled as program participants. Frequently, participants have dropped out of school, have minimal job skills, have multiple health conditions, stemming from issues related to obesity and have many economic constraints due to poverty.

Local Food Systems: The program's target audience is Virginians most susceptible to food insecurity and hunger with specific on producers, consumers and local food system stakeholders that can improve food availability and affordable access.

Speciality Foods: Home-based business potential and existing owners, and agricultural producers.

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 adults participating in diabetes educational programs.
- Number of adults participating in at least one session on adult nutrition, fitness, worksite wellness, or health.
- Number of research papers published on food, nutrition and health.
- Number of Master Food volunteers trained to extend the work of an Extension educator.
- Number of food nutrition and health publications.
- Number of workshops, conferences, posters, and presentations on food nutrition and health.
- Number of fresh produce producers attending on farm food safety trainings provided through Virginia Cooperative Extension.
- Number of youth participating in Extension nutrition education, physical activity, or other obesity-prevention programs at childcare centers, schools, after school programs, camps, or other settings.
- Number of adults, participating in Extension nutrition education, physical activity, or other obesity-prevention programs.
- Number of active research projects on food, nutrition and health.
- The number of food handlers completing food safety training.
- The number of workshops conducted on food safety practices for industry, producers and consumer organizations.
- Number of home based business entrepreneurs and producers seeking assistance from the Food Processor Technical Assistance Program.
- Number of youth engaged in Healthy Lifestyles.
- 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	Increase in the number of individuals with diabetes who have improved their Hemoglobin A1c level, meal planning behaviors or physical activity behaviors, three months after participating in a Diabetes Education programs offered in collaboration with a local health care provider.
2	Increase in number of adults that make lifestyle changes which improve their dietary quality and/or physical activity level after participation in VCE programs.
3	Number of discoveries from completed obesity related research projects which focus on examining adult obesity from its root causes to its association with chronic disease.
4	Number of discoveries from completed research projects which focus on vector-borne diseases and public health pests.
5	Increase in the number of Virginia fresh produce growers that change their behaviors to reflect safer practices on their farms, reducing the risk of contamination of produce with foodborne pathogens ultimately preventing foodborne illness.
6	Increase in the number of local food and farm enterprises that improve and strengthen their profitability and viability through partnering with Virginia Cooperative Extension.
7	Increase in the number of local food and farm enterprises that improve their market development, business planning, and conservation of natural resources by partnering with Virginia Cooperative Extension.
8	Evaluation of two patient-centered, theory-based, technology-enhanced diabetes prevention programs to initiate and sustain weight loss among pre-diabetic adults within a health care setting.
9	Researchers evaluating how to increase food availability and access to communities in the Appalachia regions of VA, NC and WV
10	Increase the number of youth participating in foods, nutrition, and health programs that demonstrate healthy living choices.
11	Increase in number of families/caregivers that make lifestyle changes which improve their dietary quality and/or physical activity level after participation in VCE programs.
12	Increase the number of local communities partnering with Virginia Cooperative Extension faculty to strengthen and develop the connection between local agriculture producers and growers with local food-related businesses and purchasing institutions resulting in reduced food insecurity and hunger.
13	Increase the number and knowledge of local food and farm enterprises partnering with Virginia Cooperative Extension to improve and strengthen their profitability and viability through market development, business planning, and conservation of natural resources.

Outcome # 1

1. Outcome Target

Increase in the number of individuals with diabetes who have improved their Hemoglobin A1c level, meal planning behaviors or physical activity behaviors, three months after participating in a Diabetes Education programs offered in collaboration with a local health care provider.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 702 - Requirements and Function of Nutrients and Other Food Components
- 703 - Nutrition Education and Behavior
- 724 - Healthy Lifestyle

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

Outcome # 2

1. Outcome Target

Increase in number of adults that make lifestyle changes which improve their dietary quality and/or physical activity level after participation in VCE programs.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 703 - Nutrition Education and Behavior
- 724 - Healthy Lifestyle

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension

Outcome # 3

1. Outcome Target

Number of discoveries from completed obesity related research projects which focus on examining adult obesity from its root causes to its association with chronic disease.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 702 - Requirements and Function of Nutrients and Other Food Components
- 703 - Nutrition Education and Behavior
- 724 - Healthy Lifestyle

4. Associated Institute Type(s)

- 1862 Research

Outcome # 4

1. Outcome Target

Number of discoveries from completed research projects which focus on vector-borne diseases and public health pests.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 724 - Healthy Lifestyle

4. Associated Institute Type(s)

- 1862 Research

Outcome # 5

1. Outcome Target

Increase in the number of Virginia fresh produce growers that change their behaviors to reflect safer practices on their farms, reducing the risk of contamination of produce with foodborne pathogens ultimately preventing foodborne illness.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 724 - Healthy Lifestyle

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 6

1. Outcome Target

Increase in the number of local food and farm enterprises that improve and strengthen their profitability and viability through partnering with Virginia Cooperative Extension.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 724 - Healthy Lifestyle

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 7

1. Outcome Target

Increase in the number of local food and farm enterprises that improve their market development, business planning, and conservation of natural resources by partnering with Virginia Cooperative Extension.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 724 - Healthy Lifestyle

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 8

1. Outcome Target

Evaluation of two patient-centered, theory-based, technology-enhanced diabetes prevention programs to initiate and sustain weight loss among pre-diabetic adults within a health care setting.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 703 - Nutrition Education and Behavior
- 724 - Healthy Lifestyle

4. Associated Institute Type(s)

- 1862 Research

Outcome # 9

1. Outcome Target

Researchers evaluating how to increase food availability and access to communities in the Appalachia regions of VA, NC and WV

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 502 - New and Improved Food Products

4. Associated Institute Type(s)

- 1862 Research

Outcome # 10

1. Outcome Target

Increase the number of youth participating in foods, nutrition, and health programs that demonstrate healthy living choices.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 702 - Requirements and Function of Nutrients and Other Food Components
- 703 - Nutrition Education and Behavior
- 724 - Healthy Lifestyle

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 11

1. Outcome Target

Increase in number of families/caregivers that make lifestyle changes which improve their dietary quality and/or physical activity level after participation in VCE programs.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 703 - Nutrition Education and Behavior
- 724 - Healthy Lifestyle

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 12

1. Outcome Target

Increase the number of local communities partnering with Virginia Cooperative Extension faculty to strengthen and develop the connection between local agriculture producers and growers with local food-related businesses and purchasing institutions resulting in reduced food insecurity and hunger.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 112 - Watershed Protection and Management
- 604 - Marketing and Distribution Practices
- 703 - Nutrition Education and Behavior
- 704 - Nutrition and Hunger in the Population

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

Outcome # 13

1. Outcome Target

Increase the number and knowledge of local food and farm enterprises partnering with Virginia Cooperative Extension to improve and strengthen their profitability and viability through market development, business planning, and conservation of natural resources.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 112 - Watershed Protection and Management
- 604 - Marketing and Distribution Practices

- 703 - Nutrition Education and Behavior
- 704 - Nutrition and Hunger in the Population

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

Description

Food, nutrition, and health - The economy (i.e. employment opportunities, etc.) can directly influence food purchases and food security of families and caregivers of children and furthermore weight status. Public policy changes can affect food access and availability and opportunities for physical activity that influence overall dietary quality, physical activity levels, and health status. Several populations, particularly Hispanic and African American individuals, have higher rates of obesity. With population shifts within Virginia, it is possible to see changes in childhood obesity prevalence rates.

Vector-borne diseases and public health pests - Temperature, weather, and migration patterns can influence the proliferation of vector-borne and infectious diseases.

Childhood Obesity - The economy (i.e. employment opportunities, etc.), as well as gas prices (which can, in turn, increase food prices) can directly influence food purchases and food security of families and caregivers of children and furthermore weight status. Public policy changes, particularly those directed at children, can also effect dietary and physical activity status of children. For example, the Healthy Hungry-Free Kids Act (Child Nutrition & WIC Reauthorization Act of 2010) has recommended dramatic changes to foods offered at schools participating in the USDA school breakfast and lunch programs, along with funding for farm-to-school programs. Several populations, particularly Hispanic and African American individuals, have higher rates of obesity. With population shifts within Virginia, it is possible to see changes in childhood obesity prevalence rates.

Food Safety - If food production facilities and/or agriculture is damaged or disturbed by a natural disaster, less food is available to be processed and consumed. This not only has an impact on local economies and

access to food, but how Extension educators respond to local needs. Other factors that may influence outcomes include economic changes (e.g. employment rates, disposable income and purchasing power of consumers for food, food security, purchasing patterns of consumers as they relate to Virginia foods), public policy changes (e.g. taxation of "junk foods," restrictions in food advertising toward children, changes in nutrition integrity and physical education guidelines for schools, HACCP guidelines, new regulations imposed on raw food items sold on the Internet markets), and population changes (eg. immigration, new cultural groups, new food processing needs). If economic, demographic, social, and legal characteristics change at the local and state levels.

Family Nutrition Program - The economic downturn in the nation has resulted in more people looking for food resources. As a result, more families are participating in the SNAP program as well as utilizing the services of food banks and their member agencies to feed their families. Funding opportunities are competitive which could prevent VCE from implementing the SNAP-Ed program.

Local Food Systems - The current economic situation and possible weather extremes may be a challenge for rural and urban communities over the next five years. The economic and political situation continues to be tenuous, and this situation could affect funding for some programs and personnel. Additionally, the economic and political situation could also exacerbate food insecurity issues if employment opportunities do not increase statewide and localities continue to face dwindling financial resources.

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

Food, nutrition, and health - All major programs relating to food, nutrition, and health are evaluated to determine program effectiveness, although outcomes may not be available from all locations statewide. Research funding has enabled us to expand our reach in various program areas and in that situation, data are gathered at every location.

Several ongoing research evaluation studies are planned during this planning cycle, including: the examination of the cost-effectiveness of youth EFNEP; evaluation of the Youth Voice, Youth Choice program; a children's menu initiative; the impacts of Healthy Weights for Healthy Kids on overall dietary and physical activity self-efficacy and behavior; and effect of Food Friends and Mighty Moves on preschool dietary and physical activity behaviors.

Vector-borne diseases and public health pests - Workshops/trainings will be evaluated to determine their effectiveness in evoking changes in practices and/or behaviors.

Family Nutrition Program - The NEERS5 system is utilized to aggregate the appropriate data. The GREEN data base system aggregates the number of delivery sites in the Family Nutrition Program.

Local Food Systems - Conduct ongoing assessments of food deserts, access and availability (i.e., proximity, transportation, financial/economic, other) to local, regional food systems. • Conduct a cost and ecological analysis comparing local/regional foods to foods purchased and transported from other states, regions, and countries a. Consider economic costs, direct, indirect and induced effects, and

ecological footprints, b. Create educational materials and/or a social marketing campaign to share findings from the analysis and embed materials within educational programs/curricula.

Speciality Foods - Measure the economic impacts off assistance provided.

V(A). Planned Program (Summary)

Program # 5

1. Name of the Planned Program

Natural Resources, Environment, and Climate Change

2. Brief summary about Planned Program

This Planned Program aims to improve the management of the state's soil and water resources, 15.4 million acres of forest land, 680,000 acres of freshwater lakes, and 5,000 miles of shoreline while positively impacting climate change. Effective programming efforts will have strong impacts on land management efforts, which ultimately will directly affect forest stewardship, agricultural practices and climate change. Demonstrating the importance of effective forest, water or soil management will increase the storage of carbon and decrease the use of petrochemicals that directly impact our environment. The bulk of Virginia's natural resources are in private ownership. Therefore, in the absence of strict regulations, VCE is reliant upon financial incentives and education/technical assistance to help private owners make wise decisions on the management and use of natural resources. For example, though the state has ownership rights to the state's fish and wildlife populations, the habitat is owned and managed mostly by private individuals. Without the proper knowledge, private landowners may not make the best decisions on managing wildlife habitat. VCE is the only state agency charged solely with providing educational services to owners of Virginia's natural resources. While other agencies also provide some education, they are regulatory agencies and do not often gain the trust of the landowner which Extension provides. Additionally, personnel with other agencies are excellent partners in education, but often lack the training and resources to be strong educators. VCE can also assist state regulatory agencies develop technically-sound regulations and best management practices for protecting soil and water resources. For example, personnel from of the Virginia Department of Transportation require training in the environmentally sound management of the sizeable acreage under their control. Wastewater, water, and solid waste utilities must make sound environmental and economic decisions on the treatment and utilization of solid and liquid wastes that they process and generate. Finally, Virginia relies heavily on its rich natural resource base for both economic and recreational benefits. Virginia's soil, water, forest, and wildlife resources support manufacturing and recreational industries valued at over \$25 billion annually. Educational opportunities impact these industries by providing tools for effective decision making that impact good land management decisions, efficient processing activities and reduced energy consumption. VAES will play a vital role by providing the knowledge base necessary for the development of appropriate Natural Resource policies and to provide Virginia's commercial and private landowners information needed to properly manage their holdings in an economically and environmentally sustainable manner.

3. Program existence : Mature (More than 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
102	Soil, Plant, Water, Nutrient Relationships	10%	0%	30%	0%
111	Conservation and Efficient Use of Water	5%	0%	5%	0%
112	Watershed Protection and Management	15%	15%	20%	0%
123	Management and Sustainability of Forest Resources	20%	30%	15%	0%
124	Urban Forestry	5%	15%	5%	0%
125	Agroforestry	0%	15%	0%	0%
131	Alternative Uses of Land	15%	15%	0%	0%
133	Pollution Prevention and Mitigation	5%	0%	0%	100%
135	Aquatic and Terrestrial Wildlife	8%	0%	10%	0%
314	Toxic Chemicals, Poisonous Plants, Naturally Occurring Toxins, and Other Hazards Affecting Animals	2%	0%	5%	0%
403	Waste Disposal, Recycling, and Reuse	10%	0%	0%	0%
605	Natural Resource and Environmental Economics	5%	10%	10%	0%
	Total	100%	100%	100%	100%

V(C). Planned Program (Situation and Scope)**1. Situation and priorities**

Natural Resources, Environment, and Climate Change is a very broad Planned Program, with many inherent issues. For example, Virginia's forests provide a host of multiple benefits, some monetary like the sale of stumpage, and some intrinsic, such as clean water, carbon storage, and an aesthetic environment. Yet, there are problems in the forest. Insects, disease, and fire all take their toll. Additionally, forests are being invaded by a host of exotic plant species, like the tree-of-heaven, Japanese honeysuckle, oriental bittersweet, and autumn-olive. Virginia also loses over 25,000 acres of forest/agricultural land for development every year. Forest landowners need the latest research to best manage their lands and understand the importance of keeping land in forests. Extension programs provide just that. In many cases landowners need basic information and assistance to prepare management plans, and locating sources of governmental financial assistance. Many farmers and forest owners are concerned about protecting their lands in the long term, and want unbiased information about conservation easements and other protection tools. Many activities on the land contribute to nonpoint source pollution of the state's waters, and Extension can assist with educational programs for a wide variety of issues and audiences. For example: Land managers, waste applicators, land reclamation professionals, and farmers need assistance with nutrient management plans to guide them in fertilizer applications, and in waste application treatments and utilization. All of these efforts have a strong impact on climate change and our environment. In far southwest Virginia landowners and coal mine operators need assistance in correctly

applying reclamation practices to insure both prudent bond release and a favorable environment after the reclamation process is completed. Public utilities are tasked with processing solid and liquid wastes and must understand proper land management practices to prevent impairment of soil and water resources, and state regulatory personnel require technical guidance to develop sound environmental regulation. Educational efforts in biomass growth utilization for energy offer new markets for our farmers and landowners, while reducing fossil fuel consumption that impacts climate change.

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

Many assumptions are implicit in this planned program. For example, most of the natural resources in Virginia are privately owned, and this will probably continue. While Virginia has some environmental regulations, it is not known as a heavily regulated state. Governmental financial incentives and education/technical assistance guide farmers and landowners in land management decisions. Extension is in the strongest position to provide this education. It is assumed that through education, farmers and landowners will make prudent decisions, and adopt new technologies. It is also assumed that internet use in the home will increase in the future, as more of our educational materials are web based. Furthermore, it is assumed that publicly owned utility operators and state regulatory agencies will make wise decisions that affect the public through increased educational efforts.

2. Ultimate goal(s) of this Program

To impact climate change through educational and research efforts that directly foster greater forest stewardship, environmentally sound land management activities and improved water quality. To provide for improved environmental quality, while also providing for economic vitality of 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
2015	37.8	2.0	51.2	1.0
2016	38.8	2.0	53.3	1.0
2017	38.8	3.0	56.9	1.0
2018	40.5	3.0	58.0	1.0

Year	Extension		Research	
	1862	1890	1862	1890
2019	41.4	3.0	59.1	1.0

V(F). Planned Program (Activity)

1. Activity for the Program

Primary outputs from this program include the following: developing and delivering educational programs such as short courses, workshops, field days and tours, seminars, conducting applied research and link with extension, develop and maintain demonstration areas, developing collaborative partnerships with government officials, state agencies, non-governmental organizations, developing and disseminating educational materials such as extension bulletins, journal articles, conference proceedings, webinars, trade journal articles, DVD's, and developing and maintaining web based educational materials such as short courses, web sites, discussion boards.

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

Extension

Direct Methods	Indirect Methods
<ul style="list-style-type: none"> ● Education Class ● Workshop ● Group Discussion ● One-on-One Intervention ● Demonstrations ● Other 1 (web-based applications) ● Other 2 (satellite delivery) 	<ul style="list-style-type: none"> ● Public Service Announcement ● Newsletters ● TV Media Programs ● eXtension web sites ● Web sites other than eXtension

3. Description of targeted audience

Farmers, forest owners, loggers, Christmas tree growers, youth, homeowners, mill owners and workers, private consultants and companies, local **and national** governmental officials, **scientists and extension educators**, private landowners, waste water treatment operators, state and federal agencies, nongovernmental organizations, professional associations and societies, and community groups.

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 educational programs offered.
- Number of educational materials and curricula developed
- The amount of competitive grant funding received.
- Identifiable impacts reported by agents/specialists
- Number of counties where drinking water clinics are held.
- Number of participants in drinking water clinics.
- Number of drinking water samples tested.
- Number of extension agents, volunteers and agency collaborators trained through the Virginia Master Well Owner Network.
- Number of educational contacts made by VAMWON volunteers and the state coordinator.
- The number of programs for landowners which address the impacts of Best Management Practice implementation and riparian buffers on water quality.
- The number of SHARP Logger Programs which address the impacts of Best Management Practice implementation and riparian buffers on water quality.
- The number of workshops for small woodlot owners which emphasize the importance of small lots, non-timber forest products, and resources available to help owners of small lots.
- 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	Increase in the number of individuals who gain knowledge as certified nutrient management planners.
2	The general public, landowners, and loggers use the forest in alternative and traditional ways to increase value and profit.
3	Licensed water well drilling contractors partner with VAHWQP to provide well inspections to homeowners, leading to homeowners having an improved understanding of their systems' function and awareness if systems need remediation or repair.
4	Private water supply users better understand water system design and function, test their water, and take recommended actions to protect and improve their water systems.
5	Private landowners obtain a written management plan from a natural resource professional before initiating forest management practices and implement at least one BMP.
6	Logging professionals protect water quality during logging operations by properly implementing all appropriate BMPs and maintaining riparian buffers.
7	Small lot owners adopt stewardship practices that enhance ecosystem services of their properties.
8	Researchers are calibrating the performance of a common watershed model for estimating water quality to allow the prediction of water quality at the watershed scale.
9	Research into climate change adaptation techniques for vegetable producers will result in concrete recommendations for the use of strip tillage as a climate change adaptation strategy in the United States and abroad.

Outcome # 1

1. Outcome Target

Increase in the number of individuals who gain knowledge as certified nutrient management planners.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 112 - Watershed Protection and Management
- 133 - Pollution Prevention and Mitigation

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 2

1. Outcome Target

The general public, landowners, and loggers use the forest in alternative and traditional ways to increase value and profit.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 123 - Management and Sustainability of Forest Resources
- 131 - Alternative Uses of Land
- 403 - Waste Disposal, Recycling, and Reuse

4. Associated Institute Type(s)

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

Outcome # 3

1. Outcome Target

Licensed water well drilling contractors partner with VAHWQP to provide well inspections to homeowners, leading to homeowners having an improved understanding of their systems' function and awareness if systems need remediation or repair.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 133 - Pollution Prevention and Mitigation

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 4

1. Outcome Target

Private water supply users better understand water system design and function, test their water, and take recommended actions to protect and improve their water systems.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 133 - Pollution Prevention and Mitigation

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 5

1. Outcome Target

Private landowners obtain a written management plan from a natural resource professional before initiating forest management practices and implement at least one BMP.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 112 - Watershed Protection and Management
- 123 - Management and Sustainability of Forest Resources
- 133 - Pollution Prevention and Mitigation

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

Outcome # 6

1. Outcome Target

Logging professionals protect water quality during logging operations by properly implementing all appropriate BMPs and maintaining riparian buffers.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 112 - Watershed Protection and Management
- 123 - Management and Sustainability of Forest Resources
- 133 - Pollution Prevention and Mitigation

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 7

1. Outcome Target

Small lot owners adopt stewardship practices that enhance ecosystem services of their properties.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 112 - Watershed Protection and Management
- 123 - Management and Sustainability of Forest Resources
- 133 - Pollution Prevention and Mitigation

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 8

1. Outcome Target

Researchers are calibrating the performance of a common watershed model for estimating water quality to allow the prediction of water quality at the watershed scale.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 112 - Watershed Protection and Management
- 133 - Pollution Prevention and Mitigation

4. Associated Institute Type(s)

- 1862 Research

Outcome # 9

1. Outcome Target

Research into climate change adaptation techniques for vegetable producers will result in concrete recommendations for the use of strip tillage as a climate change adaptation strategy in the United States and abroad.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management

4. Associated Institute Type(s)

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

Description

Many external factors affect both the outcomes and the ability to support **the research and** educational programs behind the outcomes. Natural disasters can not only siphon off funds, but create new issues related to climate change, natural resources and the environment. For example, hurricane blowdown can flood the market with low cost wood, and create fuel buildup and insect and disease problems. Floods and droughts have unique problems, and both greatly affect natural resources issues. Certainly, funding for **Research and** Extension programs, particularly state funds, control the ability to develop and deliver **new knowledge and** programs. Finally, new laws and regulations may both create new issues and opportunities, and also cause other issues to fade away. In most cases new regulations result in a need for **more research and additional** education for those affected by the regulations.

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

Evaluation of a broad array of programs, such as those represented by the Climate Change and Natural Resource planned program, require a multitude of varying procedures. In general, Extension educators are responsible for determining their evaluation procedure that best fits their program, time, and fiscal resources. For example, the Virginia Sharpe Loggers Program undertook a complete evaluation covering the years of the program. An extensive survey of program participants is was conducted and adjustments were made from the results to further meet the audience needs. One adjustment was the development of on-line training for loggers for recertification. The Landowner education impact team and the evaluation instructme

V(A). Planned Program (Summary)

Program # 6

1. Name of the Planned Program

Strengthening Virginia Families

2. Brief summary about Planned Program

This planned program targets a diverse audience across the life span of all economic income levels within the Commonwealth of Virginia. Children and families are confronted with a multitude of issues that affect their well-being. Concerns about how Virginia's youth and families are functioning, adjusting, and adapting to these issues have economic impacts for Virginia. This planned program aims to increase economic stability by improving youth and family financial literacy and security. It further seeks to develop and deliver educational programs to increase the understanding and development of the social, cognitive, and physical capacities of Virginians through emphasis on content such as parenting education, child care provider training, and adult caregiving.

3. Program existence : Mature (More than 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
602	Business Management, Finance, and Taxation	0%	5%	0%	0%
607	Consumer Economics	0%	10%	0%	0%
724	Healthy Lifestyle	0%	30%	0%	0%
801	Individual and Family Resource Management	60%	25%	0%	0%
802	Human Development and Family Well-Being	30%	30%	0%	0%
804	Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures	10%	0%	0%	0%
	Total	100%	100%	0%	0%

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

1. Situation and priorities

All children and families can grow and develop to realize their full potential. They are confronted with a multitude of issues that affect their well-being such as child and school-aged care, at-risk youth

behaviors, strained family relationships, aging populations and poverty. Concerns about how Virginia's youth and families are functioning, adjusting, and adapting to these issues have economic impacts for the Commonwealth and are backed by VCE's community situation analysis results. Further, Extension programs for youth, adults, and families have shown positive influences on the quality of family and community life. It is VCE's, VT's, and VSU's responsibility to continue to apply research, educate, and provide outreach services to insure best practices that create healthy families.

2. Scope of the Program

- In-State Extension
- Multistate Extension

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

1. Assumptions made for the Program

People have a desire and have made a commitment to improve their lives; people need a knowledge base, appropriate tools, adequate resources, support, and ongoing evaluation and feedback to improve their lives and their family functioning; and people need connection with others, opportunities to practice new skills and positive interactions with role models and mentors in a nurturing environment. Educational programs must be under girded by a solid research base. Finally, through engaging volunteers and program stakeholders, programs can serve as catalysts for change.

2. Ultimate goal(s) of this Program

The ultimate goal of this planned program is to improve youth and family functioning through the use of collaborative, integrative, educational programming and research in the areas of parenting, child development, child care, individual and family financial management and youth financial education. To achieve the goal, VCE will apply a multidisciplinary tactic using trained professionals and volunteers to ensure a holistic approach to strengthening families to create lasting changes and improve self-sufficiency. Through science-based family and human development educational programming, parents and caregivers will increase knowledge and skills related to employing effective, positive, and safe practices. Moreover, educational programming in financial management will raise awareness, knowledge, and skills regarding financial strategies to improve financial stability of families and individuals. The result of applying science-based educational tools in the programming will improve financial decision-making among youth and adults.

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
2015	17.3	2.0	0.0	0.0
2016	17.3	2.0	0.0	0.0
2017	17.3	3.0	0.0	0.0

Year	Extension		Research	
	1862	1890	1862	1890
2018	18.0	3.0	0.0	0.0
2019	18.5	3.0	0.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

To address the Strengthening Virginia Families planned program, we will:

1. Conduct workshops in human development, parenting education, child care provider training, housing, and individual and family resource management
2. Deliver services in individual and family resource management
3. Develop print and electronic resources in human development, housing, and individual and family resource management
4. Provide and distributed available resources, including eXtension, in human development, housing, and individual and family resource management
5. Provide professional and volunteer development training in child care, parenting, and individual

and

6. Provide counseling in financial management
7. Partner with local, regional and state agencies, organizations, faith-based groups, etc.
8. Facilitate meetings of task forces, coalitions, committees, addressing human development and financial management issues

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

Extension

Direct Methods	Indirect Methods
<ul style="list-style-type: none"> ● Education Class ● Workshop ● Group Discussion ● One-on-One Intervention ● Other 1 (web-based training) 	<ul style="list-style-type: none"> ● Public Service Announcement ● Newsletters ● Web sites other than eXtension ● Other 1 (e-mail, phone, newspaper) ● Other 2 (materials and resources)

3. Description of targeted audience

Families, youth, individuals, older adults, adult home caregivers, child care providers and early childhood educators, providers of after-school care, community organizations, home owners and government officials, donors, K-12 educators, and volunteers.

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 trainings, educational workshops, and on-line education sessions held in planned program are for targeted audiences.
- Number of fact sheets, publications, newspaper articles, and curricula on strengthening Virginia families in human development and financial management.
- The number of programs and one-on-one counseling sessions offered by Master Financial Education Volunteers.
- Number of individuals and families attending sessions on basic financial management strategies such as budgeting, setting financial goals, establishing a saving/investing program, and implementing practices to reduce the chance for identity theft.
- Number of youth attending educational programs conducted on basic financial management strategies such as budgeting, setting financial goals, establishing a saving/investing.
- Number of program participants attending sessions on new ownership, avoiding foreclosure, purchasing and maintaining a home, and/or indoor air quality.
- The number of volunteers completing training to become Master Financial Education Volunteers.

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	Parenting Education - Increase the percentage of parenting education participants that indicate increased knowledge of effective parenting practices.
2	Child Care Provider/Early Childhood Training - Increase the percentage of early childhood professional development participants that indicate increased knowledge of core competency areas, such as basic child development, appropriate child observation and assessment, effective interaction strategies, and effective learning environments.
3	Adult Financial Management - Increase the number of individuals completing basic financial management strategies including budgeting, setting financial goals, establishing a saving/investing program.
4	Youth Financial Education - Increase the number of youth learning the basic financial management strategies such as budgeting, setting financial goals, establishing a saving/investing program after receiving financial instruction.

Outcome # 1

1. Outcome Target

Parenting Education - Increase the percentage of parenting education participants that indicate increased knowledge of effective parenting practices.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 802 - Human Development and Family Well-Being

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

Outcome # 2

1. Outcome Target

Child Care Provider/Early Childhood Training - Increase the percentage of early childhood professional development participants that indicate increased knowledge of core competency areas, such as basic child development, appropriate child observation and assessment, effective interaction strategies, and effective learning environments.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 802 - Human Development and Family Well-Being

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

Outcome # 3

1. Outcome Target

Adult Financial Management - Increase the number of individuals completing basic financial management strategies including budgeting, setting financial goals, establishing a saving/investing program.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 801 - Individual and Family Resource Management

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

Outcome # 4

1. Outcome Target

Youth Financial Education - Increase the number of youth learning the basic financial management strategies such as budgeting, setting financial goals, establishing a saving/investing program after receiving financial instruction.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 801 - Individual and Family Resource Management

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

Description

All items listed above directly affect agriculture, families, communities, and all forms of businesses, i.e., droughts, floods, poor economy, and changes in government policy can lead to dramatic shifts in the structure of an industry, and hinder the ability of families to participate in educational programming efforts. Budget cuts at the state and local levels and potentially related decreases in staffing may also impact the ability to offer as many programs/workshops.

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

Evaluation of a broad array of programs, such as those represented by Family and Consumer Sciences require a multitude of varying procedures. In general, Extension educators are responsible for determining the evaluation procedure that best fits their program, time, and money resources. For example, the Family and Consumer Sciences agents have prepared uniform evaluation surveys for financial management, parenting education programs, early childhood professional development trainings.

V(A). Planned Program (Summary)

Program # 7

1. Name of the Planned Program

Youth Development

2. Brief summary about Planned Program

4-H is the youth development education program of Virginia Cooperative Extension. 4-H is rich with learning experiences where young people partner with caring adults and volunteers in a fellowship unlike any other program available to youth today. Through 4-H, young people are encouraged to participate in a variety of activities that emphasize 4-H's "learning by doing" philosophy of youth development.

Standing for head, heart, hands, and health, 4-H uses more than a century of experience in youth development programming to build strong, confident leaders. Young people in the 4-H community learn leadership, citizenship, and a vast array of life skills that benefit them for the rest of their lives. Through school-based, after-school, and community clubs as well as camp settings, 4-H members pledge to build a better community, country, and world.

4-H participants are youth, ages 5 to 19, taking part in programs provided as the result of actions planned and initiated by Extension personnel in cooperation with volunteers. With a direct connection to research at Virginia's land-grant universities, Virginia Tech and Virginia State University, 4-H is the first experience many young people have with higher education. 4-H is characterized as being community-centered, volunteer-led, Extension-staff supervised, research-based, home- and family-oriented, publicly and privately funded, and responsive to change.

3. Program existence : Mature (More than 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
806	Youth Development	100%	100%	0%	0%
	Total	100%	100%	0%	0%

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

1. Situation and priorities

All children can grow and develop to realize their full potential. Youth and adults are confronted with a multitude of issues that affect their well-being such as child and school-aged care, at-risk youth behaviors, leadership, childhood obesity, character education, and academic enrichment. Concerns about how Virginia's youth are functioning, adjusting, and adapting to these issues have economic impacts for the Commonwealth and are backed by VCE's community situation analysis results. Further, 4-H programs for children and youth have shown positive influences on the quality of community life. It is VCE's, VT's,

and VSU's responsibility to continue to apply research, educate, and provide outreach services to insure best practices that create positive youth development.

2. Scope of the Program

- In-State Extension
- Multistate Extension

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

1. Assumptions made for the Program

Youth have a desire to learn life skills through experiential learning; youth need a knowledge base, appropriate tools, adequate resources, support, and ongoing evaluation and feedback to improve their lives; and youth need connection with others, opportunities to practice new skills and positive interactions with role models and mentors in a nurturing environment to contribute to positive youth development. Educational programs must be under girded by a solid research base. Finally, through engaging volunteers and program stakeholders, programs can serve as catalysts for change.

2. Ultimate goal(s) of this Program

To develop youth and adults working with those youth to realize their full potential "becoming effective, contributing citizens through participation in research-based, informal, hands-on educational experiences."

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
2015	81.0	2.0	0.0	0.0
2016	81.0	2.5	0.0	0.0
2017	90.3	3.0	0.0	0.0
2018	94.2	3.0	0.0	0.0
2019	96.3	3.0	0.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

Activities include leadership, civic engagement, 4-H camping programs (overnight and day), 4-H after-school programs, 4-H in-school programs, 4-H school enrichment programs, 4-H clubs (community and military), 4-H special interest programs, 4-H Cloverbud groups, district 4-H trainings, local 4-H trainings, home school education, online education and distance learning, and specialized trainings and workshops to qualify instructors and to educate trainers.

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

Extension

Direct Methods	Indirect Methods
<ul style="list-style-type: none"> ● Education Class ● Workshop ● Group Discussion ● Other 1 (Camping, ed. program & events) ● Other 2 (service learning projects) 	<ul style="list-style-type: none"> ● Public Service Announcement ● Newsletters ● TV Media Programs ● Web sites other than eXtension ● Other 1 (E-mail, phone, newspaper) ● Other 2 (Materials and resources)

3. Description of targeted audience

Youth between the ages of 5-19

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 trainings, educational workshops, and on-line education sessions for VCE's targeted audiences
- Number of fact sheets, research projects, publications and curricula on youth development.
- Number of members enrolled in-school, after-school, community clubs, special interest activities, 4-H military programs, and camps.
- Number of youth engaged in Science, Engineering, and Technology
- Number of youth engaged in Citizenship.
- Number of youth engaged in Healthy Lifestyles.
- Number of youth engaged in Healthy Living programs.
- Number of youth engaged in 4-H Animal Science programming.
- Number of youth engaged in 4-H Communication and Expressive Arts.
- Number of youth engaged in 4-H Natural Resources and Environmental Education.
- Number of youth engaged in Plants, Soils, and Entomology.
- Number of youth engaged in 4-H Careers and Consumer Education programming.
- Number of youth engaged in 4-H Leadership and Personal Development.
- Number of youth and adults engaged in 4-H Character Counts! programming.
- Number of adults engaged in Volunteer Development programming.
- 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	4-H Camping - Increase the number of 4-H youth, or parents of youth that report a positive change in responsibility and social development as a result of participation in a 4-H camp.
2	4-H Citizenship - Increase the number of 4-H youth participating as volunteers and through community service that demonstrate teamwork skills and community commitment.
3	4-H Foods, Nutrition and Health - Increase the number of 4-H youth participating in foods, nutrition, and health programs that demonstrate healthy living choices.
4	4-H Science, Engineering and Technology - Increase the number of 4-H youth that demonstrate increased knowledge, skills, aspirations, and attitudes in STEM programming.
5	4-H Animal Science - Increase the number of 4-H youth and adults participating in animal science programming that demonstrate increased knowledge of raising animals in a responsible, ethical, and economically viable manner.
6	4-H Communication and Expressive Arts - Increase the number of 4-H youth participating in communication and expressive arts programming that demonstrate increased self-efficacy in public speaking, presentations, visual arts, and performing arts.
7	4-H Natural Resources and Environmental Education - Increase the number of 4-H youth participating in natural resources and environmental education programs that demonstrate environmentally responsible behavior.
8	4-H Plants, Soils and Entomology - Increase the number of 4-H youth participating in plant, soils, and entomology programming that learn the interconnectedness of organisms and their environment.
9	4-H Careers and Consumer Education - Increase the number of 4-H youth that increase their awareness of potential career pathways through service learning programs, educational program, workforce development, and/or through the 4-H college fair.
10	4-H Careers and Consumer Education - Increase the number of 4-H youth that indicate increased knowledge/skills related to economic education and/or entrepreneurship.
11	4-H Leadership and Personal Development - Increase the number of 4-H youth that demonstrate leadership knowledge by participating in a leadership position on the club, county, state, or national level.
12	4-H Character Counts! - Increase the number of 4-H youth or parents of youth that indicate a positive change in behavior as a result of participating in 4-H Character Counts! programming.
13	4-H Adult Leaders - Increase the percent of adult 4-H volunteers participating in leadership and volunteer development who indicate increased knowledge and skill development in implementing 4-H programming.

Outcome # 1

1. Outcome Target

4-H Camping - Increase the number of 4-H youth, or parents of youth that report a positive change in responsibility and social development as a result of participation in a 4-H camp.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 2

1. Outcome Target

4-H Citizenship - Increase the number of 4-H youth participating as volunteers and through community service that demonstrate teamwork skills and community commitment.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 3

1. Outcome Target

4-H Foods, Nutrition and Health - Increase the number of 4-H youth participating in foods, nutrition, and health programs that demonstrate healthy living choices.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 4

1. Outcome Target

4-H Science, Engineering and Technology - Increase the number of 4-H youth that demonstrate increased knowledge, skills, aspirations, and attitudes in STEM programming.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

Outcome # 5

1. Outcome Target

4-H Animal Science - Increase the number of 4-H youth and adults participating in animal science programming that demonstrate increased knowledge of raising animals in a responsible, ethical, and economically viable manner.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 6

1. Outcome Target

4-H Communication and Expressive Arts - Increase the number of 4-H youth participating in communication and expressive arts programming that demonstrate increased self-efficacy in public speaking, presentations, visual arts, and performing arts.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 7

1. Outcome Target

4-H Natural Resources and Environmental Education - Increase the number of 4-H youth participating in natural resources and environmental education programs that demonstrate environmentally responsible behavior.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

Outcome # 8

1. Outcome Target

4-H Plants, Soils and Entomology - Increase the number of 4-H youth participating in plant, soils, and entomology programming that learn the interconnectedness of organisms and their environment.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 9

1. Outcome Target

4-H Careers and Consumer Education - Increase the number of 4-H youth that increase their awareness of potential career pathways through service learning programs, educational program, workforce development, and/or through the 4-H college fair.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 10

1. Outcome Target

4-H Careers and Consumer Education - Increase the number of 4-H youth that indicate increased knowledge/skills related to economic education and/or entrepreneurship.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 11

1. Outcome Target

4-H Leadership and Personal Development - Increase the number of 4-H youth that demonstrate leadership knowledge by participating in a leadership position on the club, county, state, or national level.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

Outcome # 12

1. Outcome Target

4-H Character Counts! - Increase the number of 4-H youth or parents of youth that indicate a positive change in behavior as a result of participating in 4-H Character Counts! programming.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 13

1. Outcome Target

4-H Adult Leaders - Increase the percent of adult 4-H volunteers participating in leadership and volunteer development who indicate increased knowledge and skill development in implementing 4-H programming.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

- Economy
- Appropriations changes
- Competing Public priorities

- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)
- Other (Transportation and facilities)

Description

Decreased economic stability and family dynamics can hinder the ability of youth to participate in educational programming efforts. Budget cuts could potentially impact staffing and the ability to offer as many programs/workshops. Increased pressures of standardized testing could hinder partnerships with public schools. Language barriers, cultural differences, urban/rural interface, and competition with other youth educational and/or recreational programs may hinder our ability to recruit youth and adult volunteers.

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

A variety of evaluation methodologies will be incorporated into the 4-H program planning process. The 4-H youth development program team will provide leadership in developing and conducting appropriate evaluations. Virginia 4-H will incorporate common measures in their evaluation plan.