

2012 Virginia Polytechnic Inst. & State University and Virginia 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 is a dynamic organization which stimulates 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.

Virginia Agricultural Experiment Station is committed to developing and implementing research that addresses society's needs and expectations. The College is focused on improving human and animal health and nutrition, enhancing the quality of the environment, reducing the effects of major infectious diseases, developing value-added products, 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 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 AND REPORTING: VAES, VSUARS, and VCE address a broad range of problems and issues facing citizens of Virginia through focused research and educational programming. This is accomplished and reported in VAES through the Current Research Information System (CRIS) and the College of Agricultural and Life Sciences planning and reporting system (eFARS). This system, used by VT and VSU faculty, includes annual program plans and reports focused on faculty goals, programs, outcomes, outputs, and other data. This system also provides accurate FTEs, contacts, outputs, and outcomes for each planned program. The foundation for Research and Extension programs are built on the identification and prioritization of strategic issues through annual situation analyses, which are

accomplished through the examination of trends and emerging issues identified by local advisory groups (including Extension Leadership Councils) and Extension specialists. This analysis becomes the background and rationale for deciding which problems and issues will be addressed and reported on by VAES, VSUARS, and VCE.

Between fiscal years 2008 and 2012, the base state funds for VCE and VAES have been reduced by a total of 14.3%. In response, VCE embarked on a strategic plan in May 2009, which was completed in July 2010. The process systemically examined Extension's core values and mission; defined community issues, trends, opportunities, and challenges; identified partners who are currently charged with addressing each issue; and delineated the role VCE should play in achieving desired goals. In addition, a plan for restructuring of VCE was developed and initial steps were taken to implement the plan. However, due to Virginia General Assembly action, the plan was put on hold. A new process will be initiated in 2011 in order to engage more stakeholders in plan development.

REPORTING REQUIREMENTS: All Extension faculty (agents, specialists, and administrators) and program assistants submit individual program reports. Also, county/city employees supervised by VCE conducting Extension programs submit annual program reports. Summary reports are developed from the individual reports. All research faculty are required to propose peer reviewed Experiment Station projects submitted to USDA/NIFA, and entered into CRIS. Researchers prepare annual progress and termination reports reviewed by the VAES director before being submitted to CRIS. In addition, all research and Extension faculty are required to submit an annual report through eFARS. This locally developed system documents teaching, research, and Extension accomplishments and impacts for individual, unit, college, and organizational review.

In response to NIFA and external merit reviews of the 2009 report and the 2011-2015 plan of work for Virginia, the number and type of outcomes for some planned program have been modified. Modifications were also made to incorporate the five NIFA focus areas within the structural data framework of the 2010 e-FARS reporting system.

PLANNED PROGRAMS FOR 2012-16: 1) Childhood Obesity, 2) Climate Change and Natural Resources, 3) Family Finance and Community Viability, 4) Families and Communities, 5) Food, Nutrition, and Health, 6) Food Safety, 7) Global Food Security and Hunger, 8) Sustainable Energy, and 9) Youth Development.

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

Year	Extension		Research	
	1862	1890	1862	1890
2012	283.6	20.3	184.3	14.5
2013	283.6	22.0	201.2	14.5
2014	295.3	23.0	210.8	14.5
2015	295.3	23.3	211.8	14.5
2016	295.3	23.3	220.2	14.5

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). 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, 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 for review by external anonymous experts. 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 reviewers pay particular attention to scientific and technical merit, opportunities for cooperation with other individuals and units within the University and the Virginia clientele.

Expert reviewers: 1) review all proposals for scientific and technical merits, 2) ensure all proposals fulfill the land-grant mission and priorities of the University, 3) ascertain that what is being proposed lies within the full range of expertise and capability of the investigators and the University, and 4) assist applicants with acceptable proposals for locating outside peer reviewers to further review proposals, if necessary for substance and overall quality. Based on the external reviewers' comments, the Director advises the applicant to address the concerns about the proposal or rewrite it to incorporate the relevant suggestions.

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 identified 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 thirteen 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?

All planned program teams developed 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. Planned program team leaders meet at least twice a year to discuss outcomes and impact. Many of the teams meet throughout the year to plan, implement, measure, and report on outcomes and impacts. 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. Some researchers and Extension faculty have begun to develop logic models that connect their work. 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 selected individuals from general public
- Survey of traditional stakeholder groups
- Survey of traditional stakeholder individuals
- Other (focus groups, listening sessions, issue forums, key informant interviews)

Brief explanation.

A variety of actions continue to be used to seek stakeholder input including issues forums, focus groups, community surveys, key informant interviews, and listening sessions.
<http://www.ext.vt.edu/vce/support/process/situation.html>

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 thirteen Agricultural Research and Extension Centers (ARECs) distributed across the state. 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	Childhood Obesity
2	Climate Change and Natural Resources
3	Family Finance and Community Viability
4	Families and Communities
5	Food, Nutrition, and Health
6	Food Safety
7	Global Food Security and Hunger - Agricultural Systems
8	Global Food Security and Hunger - Animal and Animal Products
9	Global Food Security and Hunger - Biotechnology and Genomics
10	Global Food Security and Hunger - Agricultural Management, Marketing and Policy
11	Global Food Security and Hunger - Family Nutrition Program
12	Global Food Security and Hunger - Local Food Systems
13	Global Food Security and Hunger - Pest Management
14	Global Food Security and Hunger - Plants and Plant Products
15	Sustainable Energy
16	Youth Development

V(A). Planned Program (Summary)

Program # 1

1. Name of the Planned Program

Childhood Obesity

2. Brief summary about Planned Program

Over the past 30 years the number of overweight children and teens has nearly tripled with the result that one in three children in the U.S. between the ages of 6 and 19 is overweight or obese. This problem of epidemic proportions presents a major public health challenge to parents, schools, and health care professionals. 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 existing childhood overweight. 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. Training for preschool and K-12 teachers, school nutrition directors and staff, and school wellness committee members, along with presentations and printed materials for parents are comprehensive strategies to combat childhood overweight.

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
702	Requirements and Function of Nutrients and Other Food Components	20%	0%	35%	0%
703	Nutrition Education and Behavior	40%	70%	35%	0%
724	Healthy Lifestyle	40%	30%	30%	0%
	Total	100%	100%	100%	0%

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

1. Situation and priorities

The growing numbers of overweight preschool, school age, and teenage children continue to challenge our society and its resources. Overweight in children has both physical and emotional consequences. Overweight 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 overweight, and overweight children are likely to continue to be overweight as adults. For the first time in history many children will die at younger ages 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. Overweight 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 LEAP, Food Friends and Mighty Moves, and I am Moving, I am Learning, directed toward preschool audiences, 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 and coaches, 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 child overweight. 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. School Health Advisory Boards, as required by law, are developing policies and goals for their implementation. VCE can provide training and support to these groups as they grow in their advocacy role.

2. Scope of the Program

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

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

1. Assumptions made for the Program

* Effective strategies to prevent childhood overweight 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.

2. Ultimate goal(s) of this Program

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 children are more likely to be overweight 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.

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
2012	6.1	1.0	5.9	0.0
2013	6.1	1.0	6.4	0.0
2014	6.3	1.0	7.3	0.0
2015	6.3	1.0	7.3	0.0
2016	6.3	1.0	7.5	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

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, 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.

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 ● Demonstrations ● Other 1 (hands-on food preparation) 	<ul style="list-style-type: none"> ● Public Service Announcement ● Newsletters ● Web sites other than eXtension

3. Description of targeted audience

Childhood Obesity, Nutrition and Fitness: young children (ages 2 - 5 years); school-age children; adolescents; parents, foster parents, and grandparents; caregivers (in-home and for-profit day care providers); teachers 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.

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

- Childhood Nutrition and Fitness - Number of pre-school age youth participating in Extension nutrition education, physical activity, or other obesity-prevention programs at childcare centers or schools.
 - Childhood Nutrition and Fitness - Number of elementary, middle, and high school-age youth participating in Extension nutrition education, physical activity, or other obesity-prevention programs in school, after-school, or recreational settings.
 - Childhood Nutrition and Fitness - Number of Head Start and preschool teachers, day care providers, elementary and secondary school teachers, school nurses, school nutrition directors, and school health and wellness committee members participating in Extension training for implementing nutrition education, physical activity, and other obesity-prevention programs reaching children and their parents.
- 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	Childhood Nutrition and Fitness - Number of pre-school age youth who try more new foods, consume more fruits and vegetables, eat a wider variety of foods, or increase their physical activity after participation in an Extension nutrition education, physical activity, or other obesity-prevention program at a Head Start or child care center or school.
2	Childhood Nutrition and Fitness - Number of select elementary, middle, or high school age youth who gain knowledge and awareness of nutrition, physical activity, or positive body image or improve at least one health- related behavior after participation in an Extension nutrition education, physical activity, or other obesity-prevention program in a school, after-school, or recreational setting.
3	Childhood Nutrition and Fitness: Number of Head Start and preschool teachers, day care providers, elementary and secondary school teachers, school nurses, school nutrition directors, and school health and wellness committee members participating in Extension training who implement a nutrition education, physical activity, or other obesity-prevention activity in their preschool, elementary or secondary school, or after-school or recreational setting.

Outcome # 1

1. Outcome Target

Childhood Nutrition and Fitness - Number of pre-school age youth who try more new foods, consume more fruits and vegetables, eat a wider variety of foods, or increase their physical activity after participation in an Extension nutrition education, physical activity, or other obesity-prevention program at a Head Start or child care center or school.

2. Outcome Type : Change in Action Outcome Measure

2012:270 2013:315 2014:360 2015:405 2016:450

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
- 1862 Research
- 1890 Extension

Outcome # 2

1. Outcome Target

Childhood Nutrition and Fitness - Number of select elementary, middle, or high school age youth who gain knowledge and awareness of nutrition, physical activity, or positive body image or improve at least one health- related behavior after participation in an Extension nutrition education, physical activity, or other obesity-prevention program in a school, after-school, or recreational setting.

2. Outcome Type : Change in Action Outcome Measure

2012:2700 2013:3150 2014:3600 2015:4050 2016:4500

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
- 1862 Research
- 1890 Extension

Outcome # 3

1. Outcome Target

Childhood Nutrition and Fitness: Number of Head Start and preschool teachers, day care providers, elementary and secondary school teachers, school nurses, school nutrition directors, and school health and wellness committee members participating in Extension training who implement a nutrition education, physical activity, or other obesity-prevention activity in their preschool, elementary or secondary school, or after-school or recreational setting.

2. Outcome Type : Change in Action Outcome Measure

2012:108 2013:126 2014:144 2015:162 2016:180

3. Associated Knowledge Area(s)

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

4. Associated Institute Type(s)

- 1862 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
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)
- Other (Loss of county agents)

Description

Re-structuring of VCE may result in shifting of programming.

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

All major programs relating to children and youth 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.

V(A). Planned Program (Summary)

Program # 2

1. Name of the Planned Program

Climate Change and Natural Resources

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.

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	10%	10%	5%	10%
102	Soil, Plant, Water, Nutrient Relationships	10%	10%	10%	10%
104	Protect Soil from Harmful Effects of Natural Elements	10%	10%	10%	10%
111	Conservation and Efficient Use of Water	5%	5%	5%	5%
112	Watershed Protection and Management	10%	10%	10%	10%
123	Management and Sustainability of Forest Resources	10%	10%	10%	10%
124	Urban Forestry	5%	10%	5%	10%
131	Alternative Uses of Land	10%	10%	10%	10%
133	Pollution Prevention and Mitigation	10%	10%	10%	10%
135	Aquatic and Terrestrial Wildlife	10%	10%	10%	10%
304	Animal Genome	0%	0%	5%	0%
403	Waste Disposal, Recycling, and Reuse	5%	5%	5%	5%
605	Natural Resource and Environmental Economics	5%	0%	5%	0%
	Total	100%	100%	100%	100%

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

1. Situation and priorities

Climate Change and Natural Resources 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
2012	19.6	0.8	18.9	0.0
2013	19.6	1.0	20.5	0.0

Year	Extension		Research	
	1862	1890	1862	1890
2014	20.4	1.0	20.4	0.0
2015	20.4	1.0	20.4	0.0
2016	20.4	1.0	21.1	0.0

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 ● 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 governmental officials, 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
 - Number of applied research projects.
 - Acres of land exposed to educational programming efforts.
 - Identifiable impacts reported by agents/specialists
- 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	Increased number of people adopting at least one new or improved land management practices.
2	Improved natural resource industries that contribute to community viability.
3	Number of participants learning about the quality of their private water supply and about private water system maintenance by participating in a county-based Virginia Household Drinking Water Program water testing clinic.
4	Increase in the number of individuals who gain knowledge as certified nutrient management planners in turf and landscape systems.
5	Increase in the number of acres covered by nutrient management plans in turf and landscape systems due to participation in Extension educational programs.
6	Increase in the tons of compost produced from organic wastes typically land-applied (manure, biosolids) or land-filled (yardwaste, biosolids, industrial sludge) as a result of increased knowledge and skills.
7	Increase in the number of people directly impacted by new or improved land management practices
8	Increased public awareness of climate change, biodiversity, and ecosystem services.
9	Increased number of stakeholders involved in community natural resource management and decision-making.
10	Increase program participants understanding of raw material conversion and modern business management practices.
11	The general public, landowners, and loggers use the forest in alternative and traditional ways to increase value and profit.
12	Increase in the number of acres directly impacted by new or improved land management practices.
13	Number of projects assembling transcriptomes for vertebrates and invertebrates from the Southern Appalachian Mountains

Outcome # 1

1. Outcome Target

Increased number of people adopting at least one new or improved land management practices.

2. Outcome Type : Change in Action Outcome Measure

2012:250 2013:250 2014:250 2015:250 2016:250

3. Associated Knowledge Area(s)

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 104 - Protect Soil from Harmful Effects of Natural Elements
- 111 - Conservation and Efficient Use of Water
- 123 - Management and Sustainability of Forest Resources
- 124 - Urban Forestry
- 133 - Pollution Prevention and Mitigation
- 135 - Aquatic and Terrestrial Wildlife
- 403 - Waste Disposal, Recycling, and Reuse

4. Associated Institute Type(s)

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

Outcome # 2

1. Outcome Target

Improved natural resource industries that contribute to community viability.

2. Outcome Type : Change in Condition Outcome Measure

2012:10 2013:10 2014:10 2015:10 2016:10

3. Associated Knowledge Area(s)

- 104 - Protect Soil from Harmful Effects of Natural Elements
- 112 - Watershed Protection and Management
- 123 - Management and Sustainability of Forest Resources
- 124 - Urban Forestry

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension

Outcome # 3

1. Outcome Target

Number of participants learning about the quality of their private water supply and about private water system maintenance by participating in a county-based Virginia Household Drinking Water Program water testing clinic.

2. Outcome Type : Change in Knowledge Outcome Measure

2012:1000 2013:1200 2014:1200 2015:1200 2016:1200

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
- 1862 Research

Outcome # 4

1. Outcome Target

Increase in the number of individuals who gain knowledge as certified nutrient management planners in turf and landscape systems.

2. Outcome Type : Change in Knowledge Outcome Measure

2012:25 2013:25 2014:25 2015:25 2016:25

3. Associated Knowledge Area(s)

- 102 - Soil, Plant, Water, Nutrient Relationships
- 104 - Protect Soil from Harmful Effects of Natural Elements
- 112 - Watershed Protection and Management
- 133 - Pollution Prevention and Mitigation

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 5

1. Outcome Target

Increase in the number of acres covered by nutrient management plans in turf and landscape systems due to participation in Extension educational programs.

2. Outcome Type : Change in Action Outcome Measure

2012:500 2013:500 2014:500 2015:500 2016:500

3. Associated Knowledge Area(s)

- 102 - Soil, Plant, Water, Nutrient Relationships
- 104 - Protect Soil from Harmful Effects of Natural Elements
- 111 - Conservation and Efficient Use of Water
- 133 - Pollution Prevention and Mitigation

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 6

1. Outcome Target

Increase in the tons of compost produced from organic wastes typically land-applied (manure, biosolids) or land-filled (yardwaste, biosolids, industrial sludge) as a result of increased knowledge and skills.

2. Outcome Type : Change in Action Outcome Measure

2012:25000000 2013:25000000 2014:25000000 2015:25000000 2016:25000000

3. Associated Knowledge Area(s)

- 133 - Pollution Prevention and Mitigation
- 403 - Waste Disposal, Recycling, and Reuse

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 7

1. Outcome Target

Increase in the number of people directly impacted by new or improved land management practices

2. Outcome Type : Change in Action Outcome Measure

2012:500 2013:500 2014:500 2015:500 2016:500

3. Associated Knowledge Area(s)

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 104 - Protect Soil from Harmful Effects of Natural Elements
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 123 - Management and Sustainability of Forest Resources
- 124 - Urban Forestry
- 131 - Alternative Uses of Land
- 133 - Pollution Prevention and Mitigation
- 135 - Aquatic and Terrestrial Wildlife
- 403 - Waste Disposal, Recycling, and Reuse

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension

Outcome # 8

1. Outcome Target

Increased public awareness of climate change, biodiversity, and ecosystem services.

2. Outcome Type : Change in Knowledge Outcome Measure

2012:100 2013:100 2014:100 2015:100 2016:100

3. Associated Knowledge Area(s)

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 104 - Protect Soil from Harmful Effects of Natural Elements
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 123 - Management and Sustainability of Forest Resources
- 124 - Urban Forestry
- 131 - Alternative Uses of Land

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension

Outcome # 9

1. Outcome Target

Increased number of stakeholders involved in community natural resource management and decision-making.

2. Outcome Type : Change in Action Outcome Measure

2012:100 2013:100 2014:100 2015:100 2016:100

3. Associated Knowledge Area(s)

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 104 - Protect Soil from Harmful Effects of Natural Elements
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 123 - Management and Sustainability of Forest Resources
- 124 - Urban Forestry
- 131 - Alternative Uses of Land
- 133 - Pollution Prevention and Mitigation
- 135 - Aquatic and Terrestrial Wildlife

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension

Outcome # 10

1. Outcome Target

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

2. Outcome Type : Change in Knowledge Outcome Measure

2012:250 2013:250 2014:250 2015:250 2016:250

3. Associated Knowledge Area(s)

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

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 11

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

2012:300 2013:300 2014:300 2015:300 2016:300

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

Outcome # 12

1. Outcome Target

Increase in the number of acres directly impacted by new or improved land management practices.

2. Outcome Type : Change in Condition Outcome Measure

2012:10000 2013:10000 2014:10000 2015:10000 2016:10000

3. Associated Knowledge Area(s)

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 104 - Protect Soil from Harmful Effects of Natural Elements
- 112 - Watershed Protection and Management
- 123 - Management and Sustainability of Forest Resources
- 124 - Urban Forestry
- 131 - Alternative Uses of Land
- 133 - Pollution Prevention and Mitigation
- 135 - Aquatic and Terrestrial Wildlife
- 403 - Waste Disposal, Recycling, and Reuse

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension

Outcome # 13

1. Outcome Target

Number of projects assembling transcriptomes for vertebrates and invertebrates from the Southern Appalachian Mountains

2. Outcome Type : Change in Knowledge Outcome Measure

2012:1 2013:1 2014:1 2015:1 2016:1

3. Associated Knowledge Area(s)

- 135 - Aquatic and Terrestrial Wildlife
- 304 - Animal Genome

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 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 Extension programs, particularly state funds control the ability to develop and deliver new 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 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, in 2008-2009 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

2012 Virginia Polytechnic Inst. & State University and Virginia State University Combined Research and Extension Plan of Work
adjustment was the development of on-line training for loggers for recertification.

V(A). Planned Program (Summary)

Program # 3

1. Name of the Planned Program

Family Finance and Community Viability

2. Brief summary about Planned Program

The well-being of Virginians is dependent on both their individual and family economic status. In addition, for Virginia small business owners, the impacts of changing markets and environmental issues affect not only their business but also their family well-being. Moreover, overall community economic viability is affected by policies, strategies, and programs undertaken by municipalities, leaders, and organizations.

Almost one-quarter of Virginia households earn less than the amount needed to meet basic monthly expenses on their own; and, slightly more than one-quarter of Virginia households do not have enough cash assets to protect them from financial ruin in the case of emergencies. In the current economic times it is even more important to improve the financial capacity of the citizens of Virginia. In addition to the above study, needs assessments, national and local headlines, and statistics dealing with bankruptcy, credit debt, and foreclosures show evidences of this need. In 2009, Virginia ranked 27th in the nation for non-business bankruptcy filings with 36,191, up from 28,212 and a rank of 37th in 2008. Virginia ranks 6th highest among states in median credit card debt. As of July of 2010, 1 in every 652 households in Virginia received a foreclosure filing, with Fairfax and Prince William counties having the highest rates. Workers with personal financial problems have difficulty getting and keeping jobs and cost their employers money. According to Georgetown University's Health Policy Institute, 65-year-old women today can expect to live about 20 more years -- and the majority of them will need at least some help living independently. Yet women are not prepared financially to support themselves in retirement. Virginia families need education on sound financial practices. On March 26, 2005, the Virginia General Assembly passed what became Code of Virginia Section 22.1-200.03B, directing the Virginia Board of Education to "establish objectives for economic education and financial literacy". In 2009 the Department of Education required a class for graduation. In 2010, the Financial Literacy and Education Commission (FLEC) issued "Promoting Financial Success in the United States: National Strategy for Financial Literacy 2011".

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.

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%	10%	10%	0%
603	Market Economics	5%	5%	10%	0%
605	Natural Resource and Environmental Economics	5%	5%	15%	0%
607	Consumer Economics	25%	20%	15%	0%
608	Community Resource Planning and Development	20%	0%	15%	0%
610	Domestic Policy Analysis	5%	0%	5%	0%
801	Individual and Family Resource Management	25%	60%	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

Improved financial capability of individuals and 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 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
- 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

Lack of management skills and knowledge of basic economic and financial management and analysis skills, are obstacles to individual and family economic well-being. 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 small businesses, individuals and families to have financial security.

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.

2. Ultimate goal(s) of this Program

To improve the financial and economic well-being of Virginians and Virginia business managers, as well as to improve the economic success and resiliency of Virginia communities, through targeted research and educational programs.

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
2012	9.9	1.0	3.0	0.0
2013	9.9	1.0	3.0	0.0
2014	10.3	1.0	3.0	0.0
2015	10.3	1.0	3.0	0.0
2016	10.3	1.0	3.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

Research and educational programs will be conducted to support the needs of Virginians and Virginia small business managers. Research in personal finance issues and evaluation of programming will be conducted to improve financial literacy. Financial literacy curriculum will be developed using proven delivery methods. Research will be conducted to develop knowledge of market systems. 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. Research will be conducted on community resiliency and enterprise development. Research-based information on these topics and on alternative economic development will be disseminated and used to create targeted educational programming and resources.

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 ● 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 individuals and families completing 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 after receiving instruction.
- 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.
- Number of youth educational programs conducted on completing basic financial management strategies such as budgeting, setting financial goals, establishing a saving/investing program after receiving financial instruction.
- Number of program participants improving their housing environment through new ownership, avoiding foreclosure or purchasing and maintaining a home.
- 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 the number of individuals completing basic financial management strategies including <u>budgeting, setting financial goals, establishing a saving/investing program.</u>
2	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).
3	Increase the number of communities and local governments partnering with Virginia Cooperative Extension faculty that seek and develop alternative economic development opportunities, and <u>community planning goals.</u>
4	Increase the number of individuals improving their housing environment by adopting techniques <u>allowing them to purchase a home or to avoid foreclosure.</u>
5	Increase the number of youth learning the basic financial management strategies such as budgeting, <u>setting financial goals, establishing a saving/investing program after receiving financial instruction.</u>
6	Increase the number of local food entrepreneurs who make direct connections with local food distribution outlets such as grocery stores, colleges, universities, hospitals, schools, nursing homes etc.

Outcome # 1

1. Outcome Target

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 Action Outcome Measure

2012:1000 2013:1000 2014:1000 2015:1000 2016:1000

3. Associated Knowledge Area(s)

- 603 - Market Economics
- 607 - Consumer Economics
- 801 - Individual and Family Resource Management
- 804 - Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension

Outcome # 2

1. Outcome Target

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

2012:40 2013:40 2014:40 2015:40 2016:40

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 # 3

1. Outcome Target

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

2012:20	2013:20	2014:20	2015:20	2016:20
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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 # 4

1. Outcome Target

Increase the number of individuals improving their housing environment by adopting techniques allowing them to purchase a home or to avoid foreclosure.

2. Outcome Type : Change in Action Outcome Measure

2012:500	2013:500	2014:500	2015:500	2016:500
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3. Associated Knowledge Area(s)

- 801 - Individual and Family Resource Management
- 804 - Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 5

1. Outcome Target

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

2012:3000 2013:3000 2014:3000 2015:3000 2016:3000

3. Associated Knowledge Area(s)

- 607 - Consumer Economics
- 801 - Individual and Family Resource Management

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

Outcome # 6

1. Outcome Target

Increase the number of local food entrepreneurs who make direct connections with local food distribution outlets such as grocery stores, colleges, universities, hospitals, schools, nursing homes etc.

2. Outcome Type : Change in Condition Outcome Measure

2012:5 2013:5 2014:5 2015:5 2016:10

3. Associated Knowledge Area(s)

- 608 - Community Resource Planning and Development

4. Associated Institute Type(s)

- 1862 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 families, 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.

As local, state, and federal budgets remain tight, county educators and support staff are lost. Additional downsizing of the number of Family and Consumer Science county educators may also result in lower than expected numbers.

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

Families and Communities

2. Brief summary about Planned Program

The two VCE program areas of FCS and Community Viability comprise the Families and Communities planned program. These two program areas provide the infrastructure which drives VCE's ability to address the family as a system. Strong families are the foundation of strong communities. Thus, the essential ingredients are combined to leverage capacity to affect and lead condition change. The program is designed to help youth and adults in Virginia confront the multitude of issues that affect their well-being and create a greater capacity for self, family, and community awareness, action, and interaction. Through interaction and increased capacity, a greater sense of community interdependence is realized. Ultimately through these accomplishments families and communities will create lasting changes and improve their lives.

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
608	Community Resource Planning and Development	40%	40%	0%	0%
802	Human Development and Family Well-Being	60%	60%	0%	0%
	Total	100%	100%	0%	0%

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

1. Situation and priorities

All children, 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 youth, families, and 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 for youth, adults, and families 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 healthy families and communities.

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 and their communities; people need a knowledge base, appropriate tools, adequate resources, support, and ongoing evaluation and feedback to improve their lives and their communities; and people need connection with others, opportunities to practice new skills and positive interactions with role models and mentors in a nurturing environment to contribute to community sustainability. 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 improve youth, family, and community functioning through the use of collaborative, integrative, educational programming and research in the areas of parenting, child development, child care, and community development.

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
2012	17.0	1.0	0.0	0.0
2013	17.0	1.0	0.0	0.0
2014	17.7	1.0	0.0	0.0
2015	17.7	1.0	0.0	0.0
2016	17.7	1.0	0.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

Activities include entrepreneurial education, asset-based economic development, leadership, civic engagement, child care provider education, parent 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 	<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

Parents, grandparents, adult home caregivers, child care providers and early childhood educators, providers of after-school care, community organizations, community partners, community leaders 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 for VCE's targeted audiences.
 - Number of fact sheets, publications, newspaper articles, and curricula on families and communities.
 - Number of citizens receiving entrepreneurial education.
 - Number of adults engaged in community-based leadership development education.
 - Number of communities partnering with Virginia Cooperative Extension faculty to address emerging issues (i.e. land use, agritourism, local foods, bioenergy, youth gangs, and others).
 - Number of workshops, activities, or programs offered to address emerging issues.
 - Number of adults engaged in facilitation skills training.
- 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, such as nurturing and guiding children, understanding basic child development, reducing family conflict and managing stress, and knowing <u>how to access available community resources to meet family needs.</u>
2	Parenting Education - Increase the percentage of parenting education participants that adopt developmentally appropriate, effective parenting practices, such as nurturing and guiding children, and <u>actively seeking to manage stress and reduce family conflicts.</u>
3	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 <u>strategies, and effective learning environments.</u>
4	Child Care Provider/Early Childhood Training - Increase the percentage of early childhood professional development participants that improve their early childhood learning environment by making practice changes, such as implementing developmentally-appropriate learning practices, <u>interaction practices and observation assessment strategies.</u>
5	Child Care Provider/Early Childhood Training - Increase the percentage of early childhood professional development participants that improve program management practices, such as effective relationships with enrolled families, record keeping, facilities management, budgeting, and emergency <u>preparedness.</u>
6	Facilitation Skills Training - Increase the percentage of trained volunteers and citizens participating in <u>facilitation skills training that indicate increased knowledge and skills as a result of participation.</u>
7	Leadership Development Education - Increase the percentage of adult citizens participating in leadership development education programs that indicate increased knowledge and skills as a result <u>of participation.</u>

Outcome # 1

1. Outcome Target

Parenting Education - Increase the percentage of parenting education participants that indicate increased knowledge of effective parenting practices, such as nurturing and guiding children, understanding basic child development, reducing family conflict and managing stress, and knowing how to access available community resources to meet family needs.

2. Outcome Type : Change in Knowledge Outcome Measure

2012:60 2013:60 2014:60 2015:60 2016:60

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

Parenting Education - Increase the percentage of parenting education participants that adopt developmentally appropriate, effective parenting practices, such as nurturing and guiding children, and actively seeking to manage stress and reduce family conflicts.

2. Outcome Type : Change in Action Outcome Measure

2012:40 2013:40 2014:40 2015:40 2016:50

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

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

2012:60 2013:60 2014:60 2015:60 2016:65

3. Associated Knowledge Area(s)

- 802 - Human Development and Family Well-Being

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

Outcome # 4

1. Outcome Target

Child Care Provider/Early Childhood Training - Increase the percentage of early childhood professional development participants that improve their early childhood learning environment by making practice changes, such as implementing developmentally-appropriate learning practices, interaction practices and observation assessment strategies.

2. Outcome Type : Change in Action Outcome Measure

2012:40 2013:40 2014:40 2015:40 2016:45

3. Associated Knowledge Area(s)

- 802 - Human Development and Family Well-Being

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

Outcome # 5

1. Outcome Target

Child Care Provider/Early Childhood Training - Increase the percentage of early childhood professional development participants that improve program management practices, such as effective relationships with enrolled families, record keeping, facilities management, budgeting, and emergency preparedness.

2. Outcome Type : Change in Action Outcome Measure

2012:40 2013:40 2014:40 2015:40 2016:45

3. Associated Knowledge Area(s)

- 802 - Human Development and Family Well-Being

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

Outcome # 6

1. Outcome Target

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

2. Outcome Type : Change in Knowledge Outcome Measure

2012:60 2013:60 2014:60 2015:60 2016:65

3. Associated Knowledge Area(s)

- 608 - Community Resource Planning and Development

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

Outcome # 7

1. Outcome Target

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

2. Outcome Type : Change in Knowledge Outcome Measure

2012:60 2013:60 2014:60 2015:60 2016:60

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

- 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 Community Viability and 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 are preparing uniform evaluation surveys for parenting education programs and early childhood professional development trainings.

V(A). Planned Program (Summary)

Program # 5

1. Name of the Planned Program

Food, Nutrition, and Health

2. Brief summary about Planned Program

Recent data show that 66% of adults are overweight, with Virginia demonstrating the fastest growth rate of obesity in the entire country. 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, there are over 240,000 people who participate in the food stamp program with the potential for many more to receive this assistance. 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), formerly food stamp 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.

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
702	Requirements and Function of Nutrients and Other Food Components	20%	0%	35%	0%
703	Nutrition Education and Behavior	40%	40%	35%	0%
724	Healthy Lifestyle	40%	60%	30%	0%
	Total	100%	100%	100%	0%

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.

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.

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.

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
2012	9.0	1.0	7.6	1.0
2013	9.0	1.0	9.9	1.0
2014	9.4	1.0	9.4	1.0
2015	9.4	1.0	9.4	1.0
2016	9.4	1.0	9.7	1.0

V(F). Planned Program (Activity)

1. Activity for the Program

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.

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

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.

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 projects completed or in progress on adult obesity and related chronic disease.
 - Number of research papers published on adult obesity and related chronic disease.
 - Number of Master Food/Health volunteers trained to extend the work of an Extension educator.
- 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.

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

2012:60 2013:70 2014:80 2015:90 2016:1530

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

2012:12200 2013:12800 2014:13400 2015:14000 2016:19800

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

2012:4 2013:4 2014:4 2015:40 2016:40

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

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

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 dietary and physical activity status of children.

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.

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

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.

V(A). Planned Program (Summary)

Program # 6

1. Name of the Planned Program

Food Safety

2. Brief summary about Planned Program

Foodborne illnesses accounts for an estimated 76 million illnesses each year in the United States with potentially deadly consequences (particularly for immuno-compromised individuals and the elderly). Further, with over 500 food processing firms headquartered in Virginia, an eight billion dollar industry, it is critical for companies to prevent food production and food processing deficiencies to be competitive and ensure safe products for consumers.

Extension and research initiatives will also take place to improve safe food handling practices in restaurants and food processing facilities (based on current Hazard Analysis Critical Control Point - HACCP standards), and to investigate strategies to prevent microbial contamination of the food supply as well as methods to remove contamination when it occurs.

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 : No

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
314	Toxic Chemicals, Poisonous Plants, Naturally Occurring Toxins, and Other Hazards Affecting Animals	5%	0%	0%	0%
501	New and Improved Food Processing Technologies	20%	0%	25%	0%
502	New and Improved Food Products	25%	0%	25%	25%
702	Requirements and Function of Nutrients and Other Food Components	0%	0%	0%	25%
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources	25%	0%	25%	0%
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	25%	100%	25%	50%
	Total	100%	100%	100%	100%

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

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 76 million illnesses, 325,000 hospitalizations, and 5,000 deaths each year associated with food microorganisms. From 2000 to 2003 Virginia reported 16 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.

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

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.

2. Ultimate goal(s) of this Program

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 improve knowledge of HACCP practices 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.

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
2012	7.3	0.5	9.5	2.0
2013	7.3	0.8	9.5	2.0
2014	7.6	0.8	10.0	2.0
2015	7.6	0.8	10.0	2.0
2016	7.6	0.8	10.0	2.0

V(F). Planned Program (Activity)

1. Activity for the Program

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.

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 ● Demonstrations 	<ul style="list-style-type: none"> ● Public Service Announcement ● Newsletters ● Web sites other than eXtension

3. Description of targeted audience

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, and commercial food processors.

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 food service managers, supervisors and food handling personnel from restaurants, cafeterias, daycare and other food service facilities completing food safety training offered by extension educators in Virginia
- Number of home-based food business workshops conducted for food product formulation, facility planning, food processing and safety, product evaluation, food packaging and labeling, and record keeping.
- Number of short-courses provided on food safety practices including HACCP training, Good Agricultural Practices and recall workshops to industry personnel, consumer organizations, Extension Agents and to local, state, and federal health inspectors
- Number of research projects completed or in progress in the area of food safety.
- Food Safety - Number of home based business entrepreneurs that have products evaluated for their safety by the 'Food Processor Technical Assistance Program' to prevent foodborne illness across the commonwealth.
- Number of consumers completing home food preservation training offered by extension educators in Virginia
- Number of temporary food vendors or other small occasional food handlers completing food safety training offered by extension educators in Virginia
- 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 food handlers (managers, supervisors, and food handling personnel from restaurants, public school and hospital cafeterias, daycare centers, nursing homes, university food service, correctional centers, civic/community groups and volunteers) who increase knowledge and skills in safe food handling practices.
2	Increase in number of home-based business entrepreneurs that increase awareness and knowledge in producing safe high acid and acidified food products.
3	Increase in number of discoveries from completed food related research projects which focus on enhancing the safety of the Nation's food supply and the development of value added foods.
4	Food Preservation - Increase in the number of consumers that increase their knowledge on how to safely preserve foods at home.

Outcome # 1

1. Outcome Target

Increase in the number of food handlers (managers, supervisors, and food handling personnel from restaurants, public school and hospital cafeterias, daycare centers, nursing homes, university food service, correctional centers, civic/community groups and volunteers) who increase knowledge and skills in safe food handling practices.

2. Outcome Type : Change in Knowledge Outcome Measure

2012:1120 2013:1220 2014:1220 2015:1200 2016:1200

3. Associated Knowledge Area(s)

- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 2

1. Outcome Target

Increase in number of home-based business entrepreneurs that increase awareness and knowledge in producing safe high acid and acidified food products.

2. Outcome Type : Change in Knowledge Outcome Measure

2012:175 2013:200 2014:200 2015:200 2016:200

3. Associated Knowledge Area(s)

- 502 - New and Improved Food Products
- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

Outcome # 3

1. Outcome Target

Increase in number of discoveries from completed food related research projects which focus on enhancing the safety of the Nation's food supply and the development of value added foods.

2. Outcome Type : Change in Knowledge Outcome Measure

2012:4 2013:4 2014:4 2015:4 2016:4

3. Associated Knowledge Area(s)

- 501 - New and Improved Food Processing Technologies
- 502 - New and Improved Food Products
- 702 - Requirements and Function of Nutrients and Other Food Components
- 711 - Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources
- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

4. Associated Institute Type(s)

- 1862 Research
- 1890 Research

Outcome # 4

1. Outcome Target

Food Preservation - Increase in the number of consumers that increase their knowledge on how to safely preserve foods at home.

2. Outcome Type : Change in Knowledge Outcome Measure

2012:10 2013:10 2014:10 2015:10 2016:35

3. Associated Knowledge Area(s)

- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

4. Associated Institute Type(s)

- 1862 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

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. If a natural disaster took place in Virginia, Extension educators in affected localities would likely redirect the attention and programming to assist with disaster relief for safe food/water and consumer issues. 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, Extension educators need to respond and tailor educational programs to these changes to be competitive with other public priorities and programmatic challenges. There is also "saturation," which may occur related to overweight and obesity given the amount of current press and attention on the topic. Finally, if appropriations decline for FCS programs, it is possible that there would be fewer FCS Extension agents influencing what could be accomplished in programs for general and specific audiences.

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

The type of evaluation study will depend on the program and activity.

V(A). Planned Program (Summary)

Program # 7

1. Name of the Planned Program

Global Food Security and Hunger - Agricultural Systems

2. Brief summary about Planned Program

Crop and livestock production may be optimized if the agricultural components are studied and managed as a system rather than as discrete operations. The interactions among system components often respond differently to management decisions than do the individual components. 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. Virginia Cooperative Extension and Agricultural Experiment Station faculty provide leadership in research, education, and Extension programming associated with agricultural systems. 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.

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	15%	15%	15%	0%
112	Watershed Protection and Management	15%	15%	15%	0%
205	Plant Management Systems	15%	15%	15%	0%
307	Animal Management Systems	15%	15%	15%	0%
403	Waste Disposal, Recycling, and Reuse	15%	15%	15%	0%
601	Economics of Agricultural Production and Farm Management	15%	15%	15%	0%
605	Natural Resource and Environmental Economics	10%	10%	10%	0%
	Total	100%	100%	100%	0%

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

1. Situation and priorities

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.

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 additional research. Extension of both established and developing knowledge of production systems that include pest (weeds, insects, disease) control and soil (cover cropping, tillage, organic matter management, nutrient management), crop (selection of appropriate species and cultivars, planting timing, row spacing, and geometries, crop rotations, etc.), and livestock (dietary management, grazing rotations, fencing, etc.), and business management (purchase/use of external inputs, marketing of outputs, value-added products, cost-return ratios, etc.) management. 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) 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).

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 7% 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% over the period outlined within this plan.

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
2012	21.9	5.0	18.4	0.0
2013	21.9	5.0	20.3	0.0
2014	22.8	5.0	20.5	0.0
2015	22.8	5.0	20.5	0.0
2016	22.8	5.0	22.4	0.0

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

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 |
|--|--|

3. Description of targeted audience

Commercial producers, 4-H youth, Master Gardeners, state and federal agency personnel, Extension educators, policy makers, consumers and supermarket chain store buyers.

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 agriculture systems educator training workshops.
- Number of agriculture systems field research experiments
- Number of agriculture systems on-farm demonstrations
- Number of agriculture systems producer training workshops
- Number of existing and future nutrient management planners and educators trained

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	Percent increase in gross income from agriculture attributable to extension efforts.
2	Increase in farms and acres subject to organic management due to extension programming efforts which will increase overall profitability of organic agriculture (total annual sales).
3	Increase in the amount of agricultural land under best management practices due to extension programming efforts.
4	Increase in the number of individuals improving water quality and reducing erosion through participation in an advanced grazing system program.
5	Increase in the number of nutrient management plans, resulting in more efficient utilization of nutrients, and in the number of plan writers trained by Extension.
6	Increase the profitability (total annual sales) of small, part-time and limited resource farmers through sustainable production of specialty agriculture crops and livestock products.

Outcome # 1

1. Outcome Target

Percent increase in gross income from agriculture attributable to extension efforts.

2. Outcome Type : Change in Condition Outcome Measure

2012:7 2013:7 2014:7 2015:7 2016:7

3. Associated Knowledge Area(s)

- 102 - Soil, Plant, Water, Nutrient Relationships
- 205 - Plant Management Systems
- 307 - Animal Management Systems
- 601 - Economics of Agricultural Production and Farm Management
- 605 - Natural Resource and Environmental Economics

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension

Outcome # 2

1. Outcome Target

Increase in farms and acres subject to organic management due to extension programming efforts which will increase overall profitability of organic agriculture (total annual sales).

2. Outcome Type : Change in Condition Outcome Measure

2012:6000000 2013:6500000 2014:6500000 2015:6500000 2016:6500000

3. Associated Knowledge Area(s)

- 102 - Soil, Plant, Water, Nutrient Relationships
- 112 - Watershed Protection and Management
- 205 - Plant Management Systems

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension

Outcome # 3

1. Outcome Target

Increase in the amount of agricultural land under best management practices due to extension programming efforts.

2. Outcome Type : Change in Action Outcome Measure

2012:400000 2013:500000 2014:500000 2015:500000 2016:500000

3. Associated Knowledge Area(s)

- 102 - Soil, Plant, Water, Nutrient Relationships
- 205 - Plant Management Systems
- 403 - Waste Disposal, Recycling, and Reuse
- 601 - Economics of Agricultural Production and Farm Management
- 605 - Natural Resource and Environmental Economics

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension

Outcome # 4

1. Outcome Target

Increase in the number of individuals improving water quality and reducing erosion through participation in an advanced grazing system program.

2. Outcome Type : Change in Action Outcome Measure

2012:280000 2013:310000 2014:340000 2015:340000 2016:340000

3. Associated Knowledge Area(s)

- 102 - Soil, Plant, Water, Nutrient Relationships
- 112 - Watershed Protection and Management
- 205 - Plant Management Systems
- 307 - Animal Management Systems

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension

Outcome # 5

1. Outcome Target

Increase in the number of nutrient management plans, resulting in more efficient utilization of nutrients, and in the number of plan writers trained by Extension.

2. Outcome Type : Change in Knowledge Outcome Measure

2012:240 2013:300 2014:300 2015:300 2016:300

3. Associated Knowledge Area(s)

- 102 - Soil, Plant, Water, Nutrient Relationships
- 112 - Watershed Protection and Management
- 205 - Plant Management Systems
- 307 - Animal Management Systems
- 403 - Waste Disposal, Recycling, and Reuse
- 601 - Economics of Agricultural Production and Farm Management
- 605 - Natural Resource and Environmental Economics

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension

Outcome # 6

1. Outcome Target

Increase the profitability (total annual sales) of small, part-time and limited resource farmers through sustainable production of specialty agriculture crops and livestock products.

2. Outcome Type : Change in Condition Outcome Measure

2012:3250000 2013:3250000 2014:3250000 2015:3250000 2016:3250000

3. Associated Knowledge Area(s)

- 205 - Plant Management Systems
- 307 - Animal Management Systems
- 601 - Economics of Agricultural Production and Farm Management

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

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 certified organic farms and acres of certified organic farmland and the number of acres of land subject to nutrient management plans/best management practices/conservation plans could be affected by government regulations and changes in the economy. If more emphasis is placed on organic production by a greater number of people, demand for these products and profitability of these operations will increase. If greater emphasis is placed on water and environmental quality then even more widespread implementation of these practices will be encouraged.

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

Participants in conferences, workshops and field days will evaluate all of the planned educational programs. Case studies will be conducted among selected vegetable growers, livestock farmers, and grain farmers who have established certified organic farming enterprises to measure their production success and their economic success. The data collected from Agriculture Statistics will provide information about number of organic farms, number of certified organic acres, and gross income of certified organic products sold.

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.

V(A). Planned Program (Summary)

Program # 8

1. Name of the Planned Program

Global Food Security and Hunger - Animal and Animal Products

2. Brief summary about Planned Program

The history of animal production goes back to the earliest settlers at Jamestown and has evolved to a highly diverse industry including beef cattle, dairy, equine, swine, small ruminants, poultry, and aquaculture. Animal production occurs on a high percentage of Virginia farms with impact upon every region of the state, and makes a significant contribution to the economy of Virginia accounting for 70% of the gross revenue generated in the agricultural sector. 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 Extension 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.

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
301	Reproductive Performance of Animals	15%	15%	15%	5%
302	Nutrient Utilization in Animals	15%	15%	15%	5%
303	Genetic Improvement of Animals	10%	10%	10%	5%
305	Animal Physiological Processes	10%	10%	10%	5%
307	Animal Management Systems	20%	20%	20%	35%
308	Improved Animal Products (Before Harvest)	10%	10%	10%	20%
311	Animal Diseases	15%	15%	15%	20%
315	Animal Welfare/Well-Being and Protection	5%	5%	5%	5%
	Total	100%	100%	100%	100%

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

1. Situation and priorities

Animal production is an important stimulus to rural economies throughout the Commonwealth. 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. Animal production systems must evolve to meet increasingly competitive economic circumstances and environmental challenges. Additionally, the quality of life is enhanced for many Virginians through the proper management and maintenance of rural landscapes hosting animal production. The health of rural economies depends on successful implementation of improved management strategies, and exploration of new technologies for future adoption. This backdrop of change, competition, and responsibility to future generations drives this program.

2. Scope of the Program

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

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

1. Assumptions made for the Program

The Planned 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.

2. Ultimate goal(s) of this Program

Our goal is to encourage continued improvement of existing animal production systems and/or development of new animal production systems 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.

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
2012	26.9	1.8	28.8	4.0
2013	26.9	2.0	31.1	4.0
2014	28.0	2.5	32.6	4.0
2015	28.0	2.5	32.6	4.0
2016	28.0	2.5	33.7	4.0

V(F). Planned Program (Activity)

1. Activity for the Program

Conduct research experiments, conduct workshops, meetings, trainings, develop publications, curriculum, resources, provide consultation, leadership, facilitation, partner with industry, and conduct needs assessment and impact.

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

3. Description of targeted audience

The target audience includes animal owners, youth, Extension educators, allied industry personnel, consumers, policy-makers, and academic colleagues.

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 animals and animal products educational meetings, workshops, conferences, training sessions, and field days
- Number of animals and animal products fact sheets, publications, newsletters, and other print resources
- Number of animal and animal products web sites, applications, and modules

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	Percent increase in beef cattle marketed through value-added programs
2	Number of additional beef producers trained and certified for quality assurance/best management practices
3	Number of dairy herds improving milk quality by culturing quarter milk samples and implementing mastitis control procedures.
4	Number of swine producers receiving continuing education credit for best management practices
5	Number of youth adopting best practices related to animal agriculture through youth animal projects and events
6	Number of program participants acquiring knowledge on best management practices related to equine.
7	Percent increase in freshwater shrimp production by Virginia farmers utilizing best management practices
8	Percent increase in sales of pond raised fish due to adoption of best management practices.
9	Increased fish production via recirculating aquaculture system (RAS) and pond production techniques through innovative research and dissemination and application of results through VCE programming to producers.
10	Number of individuals who gain knowledge to improve small ruminant production.
11	Number of commercial poultry growers adopting biosecurity practices to lower the risk of disease transmission

Outcome # 1

1. Outcome Target

Percent increase in beef cattle marketed through value-added programs

2. Outcome Type : Change in Action Outcome Measure

2012:5	2013:5	2014:5	2015:5	2016:5
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3. Associated Knowledge Area(s)

- 308 - Improved Animal Products (Before Harvest)
- 311 - Animal Diseases

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 2

1. Outcome Target

Number of additional beef producers trained and certified for quality assurance/best management practices

2. Outcome Type : Change in Action Outcome Measure

2012:100	2013:100	2014:100	2015:100	2016:100
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3. Associated Knowledge Area(s)

- 307 - Animal Management Systems
- 308 - Improved Animal Products (Before Harvest)

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

Outcome # 3

1. Outcome Target

Number of dairy herds improving milk quality by culturing quarter milk samples and implementing mastitis control procedures.

2. Outcome Type : Change in Condition Outcome Measure

2012:20 2013:20 2014:20 2015:20 2016:20

3. Associated Knowledge Area(s)

- 307 - Animal Management Systems
- 308 - Improved Animal Products (Before Harvest)
- 311 - Animal Diseases

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 4

1. Outcome Target

Number of swine producers receiving continuing education credit for best management practices

2. Outcome Type : Change in Condition Outcome Measure

2012:25 2013:25 2014:25 2015:25 2016:25

3. Associated Knowledge Area(s)

- 302 - Nutrient Utilization in Animals

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 5

1. Outcome Target

Number of youth adopting best practices related to animal agriculture through youth animal projects and events

2. Outcome Type : Change in Knowledge Outcome Measure

2012:27000 2013:27000 2014:27000 2015:27000 2016:27000

3. Associated Knowledge Area(s)

- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 307 - Animal Management Systems
- 308 - Improved Animal Products (Before Harvest)
- 311 - Animal Diseases

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

Outcome # 6

1. Outcome Target

Number of program participants acquiring knowledge on best management practices related to equine.

2. Outcome Type : Change in Knowledge Outcome Measure

2012:500 2013:500 2014:500 2015:500 2016:500

3. Associated Knowledge Area(s)

- 307 - Animal Management Systems

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 7

1. Outcome Target

Percent increase in freshwater shrimp production by Virginia farmers utilizing best management practices

2. Outcome Type : Change in Knowledge Outcome Measure

2012:5 2013:5 2014:5 2015:5 2016:5

3. Associated Knowledge Area(s)

- 307 - Animal Management Systems
- 308 - Improved Animal Products (Before Harvest)
- 311 - Animal Diseases

4. Associated Institute Type(s)

- 1890 Extension

Outcome # 8

1. Outcome Target

Percent increase in sales of pond raised fish due to adoption of best management practices.

2. Outcome Type : Change in Knowledge Outcome Measure

2012:5 2013:5 2014:5 2015:5 2016:5

3. Associated Knowledge Area(s)

- 307 - Animal Management Systems
- 308 - Improved Animal Products (Before Harvest)

4. Associated Institute Type(s)

- 1890 Extension

Outcome # 9

1. Outcome Target

Increased fish production via recirculating aquaculture system (RAS) and pond production techniques through innovative research and dissemination and application of results through VCE programming to producers.

2. Outcome Type : Change in Action Outcome Measure

2012:5 2013:5 2014:5 2015:5 2016:5

3. Associated Knowledge Area(s)

- 307 - Animal Management Systems
- 311 - Animal Diseases

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension
- 1890 Research

Outcome # 10

1. Outcome Target

Number of individuals who gain knowledge to improve small ruminant production.

2. Outcome Type : Change in Knowledge Outcome Measure

2012:500 2013:500 2014:500 2015:500 2016:500

3. Associated Knowledge Area(s)

- 307 - Animal Management Systems
- 308 - Improved Animal Products (Before Harvest)
- 311 - Animal Diseases

4. Associated Institute Type(s)

- 1890 Extension
- 1890 Research

Outcome # 11

1. Outcome Target

Number of commercial poultry growers adopting biosecurity practices to lower the risk of disease transmission

2. Outcome Type : Change in Action Outcome Measure

2012:200

2013:200

2014:200

2015:200

2016:200

3. Associated Knowledge Area(s)

- 311 - Animal Diseases

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Populations changes (immigration, new cultural groupings, etc.)
- Other (land values near urban areas)

Description

Factors beyond anticipation of this planning process such as weather, global economies, government regulations, and public perceptions impact animal agriculture both short and long-term and may affect outcomes. 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.

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

A long-term phosphorus project involves a series of tests of phosphorus in diets of dairy cows. The program includes evaluations of how to reduce surplus phosphorus. Plans are to involve about 200 dairy herds in the Chesapeake Bay watershed.

V(A). Planned Program (Summary)

Program # 9

1. Name of the Planned Program

Global Food Security and Hunger - Biotechnology and Genomics

2. Brief summary about Planned Program

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.

3. Program existence : New (One year or less)

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

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

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

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
201	Plant Genome, Genetics, and Genetic Mechanisms	20%	0%	20%	20%
202	Plant Genetic Resources	20%	0%	20%	20%
211	Insects, Mites, and Other Arthropods Affecting Plants	20%	0%	20%	20%
212	Pathogens and Nematodes Affecting Plants	20%	0%	20%	20%
304	Animal Genome	20%	0%	20%	20%
	Total	100%	0%	100%	100%

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

1. Situation and priorities

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

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

1. Assumptions made for the Program

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

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.

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
2012	0.9	0.0	6.0	1.0
2013	0.9	0.0	6.1	1.0
2014	1.0	0.0	8.1	1.0
2015	1.0	0.0	9.1	1.0
2016	1.0	0.0	10.2	1.0

V(F). Planned Program (Activity)

1. Activity for the Program

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"> ● Other 1 (Research projects and findings) ● Other 2 (Research partnerships) 	<ul style="list-style-type: none"> ● Other 1 (Research findings dissemination)

3. Description of targeted audience

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 biotechnology and genomics research projects in program areas
 - Number of peer reviewed biotechnology and genomics research papers published
 - Number of biotechnology and genomics presentations
 - Number of non-peer-reviewed biotechnology and genomics 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(I). State Defined Outcome

O. No	Outcome Name
1	Number of projects addressing genetic improvement of aquaculture stocks
2	Number of projects to reduce impact of biotic and abiotic factors on food security
3	Number of projects to improve quality of food crop plants through genetic and metabolomic research
4	Projects manipulating genomes of insects vectoring diseases.

Outcome # 1

1. Outcome Target

Number of projects addressing genetic improvement of aquaculture stocks

2. Outcome Type : Change in Knowledge Outcome Measure

2012:1 2013:1 2014:1 2015:1 2016:1

3. Associated Knowledge Area(s)

- 304 - Animal Genome

4. Associated Institute Type(s)

- 1862 Research

Outcome # 2

1. Outcome Target

Number of projects to reduce impact of biotic and abiotic factors on food security

2. Outcome Type : Change in Knowledge Outcome Measure

2012:1 2013:1 2014:1 2015:1 2016:1

3. Associated Knowledge Area(s)

- 202 - Plant Genetic Resources

4. Associated Institute Type(s)

- 1862 Research

Outcome # 3

1. Outcome Target

Number of projects to improve quality of food crop plants through genetic and metabolomic research

2. Outcome Type : Change in Knowledge Outcome Measure

2012:1 2013:1 2014:1 2015:1 2016:1

3. Associated Knowledge Area(s)

- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 202 - Plant Genetic Resources

4. Associated Institute Type(s)

- 1862 Research

Outcome # 4

1. Outcome Target

Projects manipulating genomes of insects vectoring diseases.

2. Outcome Type : Change in Knowledge Outcome Measure

2012:1 2013:1 2014:1 2015:1 2016:1

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

Description

Any of these external factors may affect outputs and outcomes of research programs in place at Virginia Tech. For example, drought can impact ability to collect field data. The economy, public policy, government regulations and program priorities all impact amount of research funding available.

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

V(A). Planned Program (Summary)

Program # 10

1. Name of the Planned Program

Global Food Security and Hunger - Agricultural Management, Marketing and Policy

2. Brief summary about Planned Program

The well-being of Virginians is dependent on both their individual and family economic status. In addition, for Virginia farmers, 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. Virginia businesses find themselves forced to manage new sources of business risk, and find that known risks are more volatile than ever before. Also, abundant commodity supplies and intense competition with other U.S. regions and international competitors have forced prices to unprofitable levels and increased farm business risk. Increasing environmental concerns force farm operators to consider the effects of farming practices beyond their farm gate. Both large and small farmers face economic challenges that affect their businesses. 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.

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
601	Economics of Agricultural Production and Farm Management	50%	50%	50%	0%
605	Natural Resource and Environmental Economics	50%	50%	50%	0%
	Total	100%	100%	100%	0%

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

1. Situation and priorities

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.

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

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, and individuals and families to have financial security.

2. Ultimate goal(s) of this Program

To improve the financial and economic well-being of Virginians and Virginia farm and business managers through targeted research and educational programs.

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
2012	7.0	0.8	7.5	0.0
2013	7.0	0.8	8.1	0.0
2014	7.3	0.8	8.5	0.0
2015	7.3	1.0	8.5	0.0
2016	7.3	1.0	8.8	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

Research and educational programs will be conducted to support the needs of Virginians and Virginia farm and small business managers. Research in personal finance issues and evaluation of programming will be conducted to improve financial literacy. Research will be conducted to develop knowledge of production and market systems. 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 	<ul style="list-style-type: none"> ● Public Service Announcement ● Newsletters ● 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; 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 farmers creating succession/transition plans for their farm business
 - Number of education programs conducted in farm and agribusiness management and risk management
 - Number of education programs conducted in marketing and direct marketing
- 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 the number of land owners who implement transition plans.
2	Increase the number of program participants (farmers, agricultural business managers and leaders, food processors, government agencies, and agribusiness firms) making more informed business and economic decisions.

Outcome # 1

1. Outcome Target

Increase the number of land owners who implement transition plans.

2. Outcome Type : Change in Action Outcome Measure

2012:60 2013:60 2014:60 2015:60 2016:60

3. Associated Knowledge Area(s)

- 601 - Economics of Agricultural Production and Farm Management
- 605 - Natural Resource and Environmental Economics

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

Outcome # 2

1. Outcome Target

Increase the number of program participants (farmers, agricultural business managers and leaders, food processors, government agencies, and agribusiness firms) making more informed business and economic decisions.

2. Outcome Type : Change in Action Outcome Measure

2012:60 2013:60 2014:60 2015:60 2016:60

3. Associated Knowledge Area(s)

- 601 - Economics of Agricultural Production and Farm Management
- 605 - Natural Resource and Environmental Economics

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
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- 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, and changes in government policy can lead to dramatic shifts in the structure of an industry). These changes may be short-lived (flood) or may cause structural changes to an industry (e.g., loss of peanut and tobacco programs).

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 # 11

1. Name of the Planned Program

Global Food Security and Hunger - Family Nutrition Program

2. Brief summary about Planned Program

Virginia Cooperative Extension implements 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 programs is to promote the healthy eating habits, food safety habits, extend food resources, and increase physical activity. Upon completion of the comprehensive program, participants are assessed on dietary behavior change, food resource management behavior change, and food safety behavior change. One key component is an assessment of participants' food security.

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
704	Nutrition and Hunger in the Population	100%	100%	100%	0%
	Total	100%	100%	100%	0%

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

1. Situation and priorities

The SNAP population has grown expediently in the last two years due to a variety of factors: economic downturn, unemployment, and decrease in stable housing. Malnourishment is a growing problem in America due to lack of nutrient dense foods. The target population of FNP is experiencing the feast and famine phenomenon which causes obesity, chronic disease, and low weight birth babies. The priorities of the program are to teach participants how to stretch food dollars and SNAP benefits, prepare nutrient dense recipes, plan meals using MyPyramid as a guide, and incorporate appropriate food safety practices.

2. Scope of the Program

- In-State Extension

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

1. Assumptions made for the 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.

2. Ultimate goal(s) of this Program

The ultimate goals are to improve health and well-being for limited resource audiences.

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
2012	10.0	2.0	10.7	0.0
2013	10.0	2.0	11.5	0.0
2014	10.4	2.0	12.1	0.0
2015	10.4	2.0	12.1	0.0
2016	10.4	2.0	12.5	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

Nutrition education will be taught to the target audience of impoverished Virginians with a comprehensive methodology. Participants completing the comprehensive programs will be assessed to determine that behavior change has been attained.

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 ● Billboards ● Newsletters ● TV Media Programs ● Web sites other than eXtension

3. Description of targeted audience

The audience 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 participating in the Free and Reduced Lunch program. People who have income 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.

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 sites where programming was delivered.

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 the number of adult participants who report that they ran out of food less often after participating in the Family Nutrition Program.

Outcome # 1

1. Outcome Target

Increase the number of adult participants who report that they ran out of food less often after participating in the Family Nutrition Program.

2. Outcome Type : Change in Condition Outcome Measure

2012:2240

2013:2300

2014:2375

2015:2440

2016:2515

3. Associated Knowledge Area(s)

- 704 - Nutrition and Hunger in the Population

4. Associated Institute Type(s)

- 1862 Extension

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

- Economy

Description

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.

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

The NEERS5 system is utilized to aggregate the appropriate data.

V(A). Planned Program (Summary)

Program # 12

1. Name of the Planned Program

Global Food Security and Hunger - Local Food Systems

2. Brief summary about Planned Program

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 viability, environmental stewardship, and small business development and job retention.

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

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

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

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

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
704	Nutrition and Hunger in the Population	100%	100%	100%	0%
	Total	100%	100%	100%	0%

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

1. Situation and priorities

A guiding principle of a healthy food system is community food security for all residents. In Virginia, the number of food insecure families is rising. One measure of food insecurity is the use of food stamps. In 2000, an average of 336,080 Virginians received food stamps each month. That number rose steadily to 488,481 in 2005, an increase of 45.3 percent. It is estimated that 80 percent of food stamp benefits go to households with children, many of them in working families, with the rest going to elderly or people with disabilities. Virginia's 73% increase in hunger between 1999 and 2004 represents the 2nd fastest rate of growth of hunger in the nation. While Virginia ranked low overall in the nation for food insecurity and hunger in sheer numbers, its fast rate of change in hunger and food insecurity is a troubling signal and disturbing trend.

Hunger and food insecurity have associated healthcare costs, particularly if regular access to good

nutritious food is limited. Medical costs directly attributable to obesity are \$117 billion per year in the U.S. In 2003, Virginia alone had \$1.65 billion in direct obesity-related healthcare costs. If consumers were to spend this same money on eating more nutritious foods - including more Virginia-grown whole grains, fruits, vegetables, dairy and meat - this would have multiple social and economic benefits and serve to improve public health, decrease health care costs, and contribute to a viable local farm economy.

To address these issues and challenges more comprehensively and holistically at the local level in relation to agricultural sustainability, community viability, ecological restoration, and food security. Virginia Cooperative Extension's Global Food Security and Hunger - Local Food Systems has focused on four broad areas as they relate to strengthening the local food system from farm-to-table to enhance availability and access to fresh, nutritious foods and produce : 1) Consumer food security, food safety, diet, and health; 2) Food system planning, management and policy; 3) Business and production management; and 4) Market development.

2. Scope of the Program

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

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

1. Assumptions made for the Program

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, and consumption. 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

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, and setting priorities education, training and overall local food system market development.

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
2012	7.3	2.0	7.8	0.0
2013	7.3	2.0	8.5	0.0
2014	7.6	2.0	8.9	0.0
2015	7.6	2.0	8.9	0.0
2016	7.6	2.0	9.2	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

- 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 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, marketing, food safety, and other educational needs to improve supply and availability of local foods.
- Develop and conduct a Virginia food system assessment and farm-to-table plan
- Organize and conduct, local regional and state conferences

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 • Web sites other than eXtension • Other 1 (Social network media)

3. Description of targeted audience

The program's target audience is all residents of Virginia and those most susceptible to food insecurity and hunger, but with specific emphasis on producers, consumers and local food system

2012 Virginia Polytechnic Inst. & State University and Virginia State University Combined Research and Extension Plan of Work
stakeholders that can improve food availability and affordable access.

Consumers

Producers

Educators pre-K - 12

Governmental officials

Extension educators

Food-based business owners

Farm-related business owners

Environmental professionals

Health and nutrition professionals

Retail and institutional food service

Distributors

Community advocates

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 programs offered regarding community food systems.

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 the number of local communities partnering with Virginia Cooperative Extension faculty to strengthen the connection between local agriculture producers and growers with local food-related businesses and purchasing institutions.
2	Number of community gardening programs implemented to address food insecurity/hunger issues.

Outcome # 1

1. Outcome Target

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

2. Outcome Type : Change in Action Outcome Measure

2012:20	2013:24	2014:28	2015:30	2016:32
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3. Associated Knowledge Area(s)

- 704 - Nutrition and Hunger in the Population

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

Outcome # 2

1. Outcome Target

Number of community gardening programs implemented to address food insecurity/hunger issues.

2. Outcome Type : Change in Condition Outcome Measure

2012:8	2013:12	2014:16	2015:20	2016:24
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3. Associated Knowledge Area(s)

- 704 - Nutrition and Hunger in the Population

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
- Public Policy changes

- Competing Programmatic Challenges

Description

On overall goal of this planned program is to address food security and hunger at the local level. An important aspect of this goal is fostering community resilience and capacity to address these issues. The current economic situation and possible weather extremes may be a challenge for rural and urban communities over the next 5 years. Our planned program team will focus on building understanding and awareness of how foundational and necessary a strong local food system is from a social, economic, and environmental perspective.

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

{NO DATA ENTERED}

V(A). Planned Program (Summary)

Program # 13

1. Name of the Planned Program

Global Food Security and Hunger - Pest Management

2. Brief summary about Planned Program

Since its inception Virginia Cooperative Extension (VCE) has conducted a range of programs addressing human health, environmental, and economic issues related to the management of pest populations 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.

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. Practices such as spraying broad-spectrum pesticides on a frequent or calendar schedule can threaten farmworker health, and affect water quality and the integrity of ecosystems. Management practices used for pests of structures, schools, and other public settings also constitute a major health concern. Virginia'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.

Citizens use pesticides frequently as the method of choice for managing pests due to cost, effectiveness, availability, and convenience. Pesticides have contributed impressively to present day agricultural productivity but have also triggered issues and concerns such as pest resistance, water contamination, and public exposure. The appropriate and safe use of pesticides is a vital part of pest management education.

Pesticide safety education in Virginia includes multidisciplinary training and certification of pesticide applicators to enable them to comply with state and federal pesticide laws and regulations. VCE conducts statewide educational programs to protect the environment and public health from improper pesticide use through applicator and public education. The primary target audience includes certified and non-certified pesticide applicators of all kinds, farm workers, and the general public. Most of the program activity involves training support for approximately 21,000 pesticide applicators who seek training to comply with federal and state pesticide laws.

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. This program includes research and educational approaches to decrease risk and increase containment opportunities for implementation in livestock and poultry production systems and crops in the event of biological threats or infectious disease outbreaks. 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 pest management educator through the efforts of its agents and specialists. This program reaches every Virginia locality through organized educational programs, demonstrations, consultations, publications, audio/visual media, and Internet resources.

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	10%	0%	10%	10%
211	Insects, Mites, and Other Arthropods Affecting Plants	10%	0%	10%	10%
212	Pathogens and Nematodes Affecting Plants	10%	0%	10%	10%
213	Weeds Affecting Plants	10%	0%	10%	10%
216	Integrated Pest Management Systems	20%	100%	20%	20%
403	Waste Disposal, Recycling, and Reuse	10%	0%	10%	10%
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources	10%	0%	10%	10%
723	Hazards to Human Health and Safety	10%	0%	10%	10%
804	Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures	10%	0%	10%	10%
	Total	100%	100%	100%	100%

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

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. Education on integrated pest management (IPM) and pesticide safety saves thousands of dollars in resources and fines for both government and the public by reducing the number of potential violations due to ignorance of the law and promotes the best management practices key to compliance and effective pest management.

A significant number of Virginia clientele have incorporated IPM practices into annual routines. However, there are still many pests and crops for which specific strategies have not been developed, and many existing strategies not fully adopted. In soybeans, the onset of new invasive species (Asian soybean rust, soybean aphid) has increased grower awareness of the importance of pest alerts and field monitoring. There is great potential for improvements in management practices. Pesticide applicators apply fewer pesticides, with more care and with a wider awareness for safety. Many potentially harmful pesticides are replaced with alternatives, both chemical and non-chemical.

Pesticide use has been the focus of much public debate and controversy. The public's perception of pesticides changed American agriculture and daily lives. Complex environmental, health and safety regulations are in place, however citizens are less likely to be impacted by hazardous pesticides in food, water, environment, and the workplace. Excessive and complex regulations make it harder for growers and businesses to compete in a world market and to remain profitable. Sound science and public education are needed to allow society to function in a balanced, productive, and healthy manner.

From the plant perspective of invasive species, the ornamental industry (nursery and landscape) sells

and plants hundreds of non-native invasive species (NIS) for landscape use. A small percentage of these species are invasive with environmental impacts that range from minor to major. The impact is species and region dependent. Some invasive NIS cause significant environmental damage by reducing biodiversity, and some become problematic agricultural weeds. Both can result in costly control measures. Thus, the ornamental horticultural industry and gardening public need to be educated on the fundamentals of invasive NIS and have access to a data base which shows which NIS are invasive, regions in which plants are most likely to be invasive, and species which can be used as alternatives. Stakeholders are nursery/landscape personnel, gardening public, natural area managers, environmental groups, legislators, and the general citizenry. A sizable amount of literature, scientific and non scientific, exists but is not well targeted at industry personnel and gardening public, the two main perpetrators of the invasive NIS problem. The most effective strategy to reduce the invasive NIS problem is to educate the industry personnel and gardening public so that they will make informed decisions on which plants to sell and plant.

2. Scope of the Program

- In-State Extension
- In-State 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

New pest management programs will be developed through the initiative and grantsmanship of faculty in pest management disciplines (entomology, weed science, plant pathology). The program will emphasize effective methods of information delivery such as grower meetings, in-service training for Extension agents, on-farm plots and demonstrations, publications, and news articles.

IPM programs will emphasize soybean, cotton, peanut, potato, forages, turf, apples, 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 Program, 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.

A number of agriculture and natural resources Extension agents will also support the IPM program with activities targeting local clientele. Typically more than 100 volunteers contribute more than 1,000 hours in this program annually.

Pesticide safety education will continue to be critical in keeping the public knowledgeable on protecting themselves from pesticides and maintaining a viable agricultural system. Funding will continue to be available from the Virginia Pesticide Control Board, the Virginia Department of Agriculture and Consumer Services, the USDA, and the USEPA. An established PSE professional development network will continue to offer opportunities in states, regions, and nationally for trainer education and sustainability of the program curriculum.

2. Ultimate goal(s) of this Program

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.

The goal is to introduce the most efficient pest management procedures to encourage a greater adoption rate. Adoption of IPM practices and pesticide safety education will reduce the amount of pesticide released into the environment and reduce worker exposure. Overall cost benefits must consider what, if any, additional costs are associated with implementing the IPM alternative (scouting costs, time, etc.).

Other goals are to teach stakeholders to use and rely on the web-based delivery system for information to acquire a habit of referencing web-based materials. This should result in more preemptive pest management practices and targeted recommendations for a broad range of pests in the future. Timely access to decision-making information should prevent needless or inappropriate applications of pesticides, product selection, application timing, and application when a pest problem is encountered. Adoption of improved pest monitoring practices, especially in newer rotation systems where new or unusual pest species may be encountered will be a priority.

Another goal is to initiate a cultural change in how pest control is approached in schools. The training program will be directed at the elimination of "preventive" pesticide applications, and the replacement of these applications with pest monitoring, prevention, and documentation. In other words, scout for pests but apply no pesticide unless there is a documented pest problem, then use only the least toxic, most effective methods available.

Pesticide applicators will meet the competency requirements of state and federal pesticide laws to be certified private and commercial applicators in the Commonwealth. Non-certified pesticide users, the public, news media, and decision-makers will gain knowledge and skills necessary to understand where pesticides fit within society, to use pesticides (if they choose to use them) safely and legally, to avoid exposure to pesticides during occupational and non-occupational activities, and to make sound decisions when choosing proper pest controls.

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
2012	26.2	0.8	28.0	1.5
2013	26.2	0.8	30.2	1.5
2014	27.3	0.8	31.7	1.5
2015	27.3	0.8	31.7	1.5
2016	27.3	0.8	32.8	1.5

V(F). Planned Program (Activity)

1. Activity for the Program

Conduct workshops, meetings, field tours, demonstrations, develop training media, training manuals, curriculum, resources, provide training, provide counseling, conduct assessments, facilitate meetings, and document stakeholder input, partner with other state and federal agencies including VDACS, USDA, EPA, conduct pesticide disposal events and related activities, conduct on-line courses and hands-on activities, conduct research experiments and surveys, Asian soybean rust/soybean aphid website, ag pest advisory, and phone assisted hotlines.

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 training courses) 	<ul style="list-style-type: none"> ● Public Service Announcement ● Newsletters ● TV Media Programs ● Web sites other than eXtension ● Other 1 (VCE Pest Management Guides)

3. Description of targeted audience

Consumers, landowners, homeowners, producers, producer groups, pesticide applicators seeking certification under federal and state laws, pesticide regulators, boards, commissions, and enforcement officials, local government, councils, and community groups, universities, colleges, K-12, youth aged 13-18, schools, advocacy and consumer protection groups and associations, pesticide safety educators, pest management specialists, and related experts, authors, journalists, other media specialists, institutional, industrial, and vector control groups and individuals, health/medical, environmental, and emergency response personnel and organizations, farm workers, migrants, and day-laborer groups and individuals, researchers, scientists, pesticide toxicologists, extension educators and related experts.

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 non-peer reviewed outreach citations incorporating information on the most effective IPM strategies and systems for use on selected commodities and/or at selected sites
 - Number of private applicators trained for certification
 - Number of commercial applicators trained for certification
 - Number of private applicators trained for recertification
 - Number of commercial applicators trained for recertification
 - Number of non-certified applicators trained
 - Number of stakeholders enrolled in the IPM Stakeholder Network
 - Number of trainers and regulatory officials trained
 - Educational media website hits communicated through the Pesticide Safety Education website
 - Number of non-peer reviewed research citations incorporating information on the most effective IPM strategies and systems for use on selected commodities and/or at selected sites.
 - Number of presentations on IPM related topics.
 - Number of volunteer hours dedicated to pest management programming
 - Number of extended learners with four or more hours of contact related to pest management
 - Amount of revenue generated in dollars for pest management Extension and research programming
 - IPM publications for clientele including extension publications, manuals and guides, multi-media pieces, websites, newspaper and trade journal articles, and papers provided at production meetings and field days.
 - Number of samples evaluated by current and improved plant diagnostic methods
- Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(I). State Defined Outcome

O. No	Outcome Name
1	Number of individuals gaining knowledge of IPM through training course completion and/or examination
2	Number of applicators who gain knowledge in pesticide safety through certification training and pass the state certification exam(s).
3	Number of applicators who gain additional knowledge in pesticide safety through re-certification training and sufficient credit to maintain their certification
4	Number of applicators, farmworkers, and the general public who gain knowledge in general pesticide safety who are not seeking certification as pesticide applicators
5	Number of trainers who gain knowledge in pesticide safety and pesticide curriculum and program training in established train-the-trainer workshops
6	Through educational programming and collaborative efforts, support the collection and proper disposal of unwanted pesticides in Virginia localities.
7	Number of localities participating in a pesticide container recycling program.
8	Number of participants gaining knowledge about invasive NIS
9	Increase the number of stakeholders collaborating with pest management strategic planning activities which support the communication of the pest management needs of Virginia and regional agricultural interests to pesticide regulatory policymakers.
10	Increase in the number of facilities that are impacted in a positive way by IPM program activities.
11	Number of Virginia soybean growers aware of Asian soybean rust risk to their crop.
12	Number of Virginia soybean growers who apply fungicide based on Asian soybean rust detection activities.
13	Number of applicators who indicated that they understand that they need to comply with state and federal regulations as a result of VCE training.
14	Number of applicators who read pesticide labels and wear personal protective equipment as a result of VCE training.
15	Number of applicators who changed their use of application equipment or calibration to reduce spray drift as a result of VCE training.
16	More than 20% of commercial producers indicate that plant disease diagnosis and recommendations results in reduced pesticide use in their operations.
17	Pest monitoring programs result in cost and time savings and increased crop protection for an increasing number of acres

Outcome # 1

1. Outcome Target

Number of individuals gaining knowledge of IPM through training course completion and/or examination

2. Outcome Type : Change in Knowledge Outcome Measure

2012:2000 2013:2000 2014:2000 2015:2000 2016:2000

3. Associated Knowledge Area(s)

- 112 - Watershed Protection and Management
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Pathogens and Nematodes Affecting Plants
- 216 - Integrated Pest Management Systems

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 2

1. Outcome Target

Number of applicators who gain knowledge in pesticide safety through certification training and pass the state certification exam(s).

2. Outcome Type : Change in Knowledge Outcome Measure

2012:1000 2013:1000 2014:1000 2015:1000 2016:1000

3. Associated Knowledge Area(s)

- 112 - Watershed Protection and Management
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Pathogens and Nematodes Affecting Plants
- 216 - Integrated Pest Management Systems
- 403 - Waste Disposal, Recycling, and Reuse

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 3

1. Outcome Target

Number of applicators who gain additional knowledge in pesticide safety through re-certification training and sufficient credit to maintain their certification

2. Outcome Type : Change in Knowledge Outcome Measure

2012:4000 2013:4000 2014:4000 2015:4000 2016:4000

3. Associated Knowledge Area(s)

- 112 - Watershed Protection and Management
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Pathogens and Nematodes Affecting Plants
- 216 - Integrated Pest Management Systems
- 403 - Waste Disposal, Recycling, and Reuse

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 4

1. Outcome Target

Number of applicators, farmworkers, and the general public who gain knowledge in general pesticide safety who are not seeking certification as pesticide applicators

2. Outcome Type : Change in Knowledge Outcome Measure

2012:950 2013:950 2014:950 2015:950 2016:950

3. Associated Knowledge Area(s)

- 112 - Watershed Protection and Management
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Pathogens and Nematodes Affecting Plants
- 216 - Integrated Pest Management Systems
- 403 - Waste Disposal, Recycling, and Reuse

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 5

1. Outcome Target

Number of trainers who gain knowledge in pesticide safety and pesticide curriculum and program training in established train-the-trainer workshops

2. Outcome Type : Change in Knowledge Outcome Measure

2012:100 2013:100 2014:100 2015:100 2016:100

3. Associated Knowledge Area(s)

- 112 - Watershed Protection and Management
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Pathogens and Nematodes Affecting Plants
- 216 - Integrated Pest Management Systems
- 403 - Waste Disposal, Recycling, and Reuse

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 6

1. Outcome Target

Through educational programming and collaborative efforts, support the collection and proper disposal of unwanted pesticides in Virginia localities.

2. Outcome Type : Change in Action Outcome Measure

2012:20 2013:20 2014:20 2015:20 2016:20

3. Associated Knowledge Area(s)

- 112 - Watershed Protection and Management
- 403 - Waste Disposal, Recycling, and Reuse

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 7

1. Outcome Target

Number of localities participating in a pesticide container recycling program.

2. Outcome Type : Change in Action Outcome Measure

2012:10 2013:10 2014:10 2015:10 2016:10

3. Associated Knowledge Area(s)

- 112 - Watershed Protection and Management
- 403 - Waste Disposal, Recycling, and Reuse

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 8

1. Outcome Target

Number of participants gaining knowledge about invasive NIS

2. Outcome Type : Change in Knowledge Outcome Measure

2012:300 2013:300 2014:300 2015:300 2016:300

3. Associated Knowledge Area(s)

- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Pathogens and Nematodes Affecting Plants
- 216 - Integrated Pest Management Systems

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 9

1. Outcome Target

Increase the number of stakeholders collaborating with pest management strategic planning activities which support the communication of the pest management needs of Virginia and regional agricultural interests to pesticide regulatory policymakers.

2. Outcome Type : Change in Action Outcome Measure

2012:25 2013:25 2014:25 2015:25 2016:25

3. Associated Knowledge Area(s)

- 112 - Watershed Protection and Management
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Pathogens and Nematodes Affecting Plants
- 216 - Integrated Pest Management Systems

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 10

1. Outcome Target

Increase in the number of facilities that are impacted in a positive way by IPM program activities.

2. Outcome Type : Change in Action Outcome Measure

2012:25 2013:25 2014:25 2015:25 2016:25

3. Associated Knowledge Area(s)

- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Pathogens and Nematodes Affecting Plants
- 216 - Integrated Pest Management Systems

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 11

1. Outcome Target

Number of Virginia soybean growers aware of Asian soybean rust risk to their crop.

2. Outcome Type : Change in Knowledge Outcome Measure

2012:200 2013:200 2014:200 2015:200 2016:200

3. Associated Knowledge Area(s)

- 212 - Pathogens and Nematodes Affecting Plants
- 216 - Integrated Pest Management Systems

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 12

1. Outcome Target

Number of Virginia soybean growers who apply fungicide based on Asian soybean rust detection activities.

2. Outcome Type : Change in Action Outcome Measure

2012:150 2013:150 2014:150 2015:150 2016:150

3. Associated Knowledge Area(s)

- 212 - Pathogens and Nematodes Affecting Plants

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 13

1. Outcome Target

Number of applicators who indicated that they understand that they need to comply with state and federal regulations as a result of VCE training.

2. Outcome Type : Change in Knowledge Outcome Measure

2012:1000 2013:1000 2014:1000 2015:1000 2016:1000

3. Associated Knowledge Area(s)

- 112 - Watershed Protection and Management

- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Pathogens and Nematodes Affecting Plants
- 213 - Weeds Affecting Plants
- 216 - Integrated Pest Management Systems
- 403 - Waste Disposal, Recycling, and Reuse
- 711 - Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources
- 723 - Hazards to Human Health and Safety

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 14

1. Outcome Target

Number of applicators who read pesticide labels and wear personal protective equipment as a result of VCE training.

2. Outcome Type : Change in Knowledge Outcome Measure

2012:1000

2013:1000

2014:1000

2015:1000

2016:1000

3. Associated Knowledge Area(s)

- 112 - Watershed Protection and Management
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Pathogens and Nematodes Affecting Plants
- 213 - Weeds Affecting Plants
- 216 - Integrated Pest Management Systems
- 711 - Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources
- 723 - Hazards to Human Health and Safety

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 15

1. Outcome Target

Number of applicators who changed their use of application equipment or calibration to reduce spray drift as a result of VCE training.

2. Outcome Type : Change in Knowledge Outcome Measure

2012:1000 2013:1000 2014:1000 2015:1000 2016:1000

3. Associated Knowledge Area(s)

- 112 - Watershed Protection and Management
- 216 - Integrated Pest Management Systems
- 403 - Waste Disposal, Recycling, and Reuse
- 711 - Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources
- 723 - Hazards to Human Health and Safety

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 16

1. Outcome Target

More than 20% of commercial producers indicate that plant disease diagnosis and recommendations results in reduced pesticide use in their operations.

2. Outcome Type : Change in Action Outcome Measure

2012:20 2013:20 2014:20 2015:20 2016:20

3. Associated Knowledge Area(s)

- 216 - Integrated Pest Management Systems

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 17

1. Outcome Target

Pest monitoring programs result in cost and time savings and increased crop protection for an increasing number of acres

2. Outcome Type : Change in Knowledge Outcome Measure

2012:20000 2013:22000 2014:24000 2015:26000 2016:28000

3. Associated Knowledge Area(s)

- 216 - Integrated Pest Management Systems

4. Associated Institute Type(s)

- 1862 Extension

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

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

Description

Although a wide variety of commodities and/or sites are encompassed in the pest management program, the factors which may affect outcomes are either those which constrain program delivery or those which constrain client adoption of practices. Factors which may affect program delivery include economy, appropriation changes, public policy changes, competing public priorities, and competing programmatic challenges. Factors which may affect client adoption include natural disasters, economy, public policy changes, government regulations, and fluctuations in commodity and/or pesticide prices.

The external factors that could affect the outcome of this program include changes in public policy, changes in government regulations, cuts in appropriations for the program, competition in public policies and programs, changes in demographics, and the cooperation of stakeholders. In the past, changing laws and public policy have driven the program content and the availability of funding. Other major challenges have been the cooperation of stakeholders. This has particularly affected the ability to establish stakeholder needs for pest management priorities and pesticide policy. A recent challenge has been the change in demographics in Virginia. There is an increased demand to offer pest management education resources in Spanish. Employers have a desire to employ non-English speaking workers as pesticide applicators. Although it is reasonable to ask for multi-lingual safety training, many employers seek to certify these employees to use pesticides. The prohibitive, besides the lack of resources to change the training materials and examinations, is that all pesticide products labeled for use in Virginia (and most states) are written in English only. Another challenge is the plans by the USEPA to convert all pesticide labels to comply with their global harmonization policy. When this changes, all training will be altered to correspond to the changes in pesticide labeling. This will create a major shift in the user community and education will be a key to avoiding problems with comprehension of these new labels.

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

Evaluation studies planned include determining the benefits of internet delivery of IPM information. Web statistics will also give an indication of the value of information on the website, visitor numbers, and future needs.

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. Schools will be contacted 6 to 12 months after IPM training.

Major tools available to the program through state pesticide regulatory partners are the results of pesticide certification exams (pass/fail data) and pesticide enforcement violation data. Monitoring the violations reported by the state pesticide regulatory agency provides for addressing needs based on changes and trends in those violations. The violations will be used to determine impact of the educational effort and where efforts need to be stepped up or new innovations need to be made to change behavior.

Violation data will be used as a threshold to measure outcomes. This program's work will contribute to holding these violations below threshold levels. Other tools will include program evaluations with questions measuring changes in attitudes and future behavior, pre- and post-tests and user surveys and stakeholder focus groups will be used to establish needs and improve program quality. These tools will be used to evaluate the impacts and outcomes of the program.

V(A). Planned Program (Summary)

Program # 14

1. Name of the Planned Program

Global Food Security and Hunger - Plants and Plant Products

2. Brief summary about Planned Program

Agriculture in Virginia has long been dominated by livestock based industries (70% of market value in 2007) 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 (2007 data), and together have a market value of \$858 million (2007 data). 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. The Virginia urban population (% of total) has increased from 81% in 1980 to 86% in 2009. This same population growth offers new opportunities and demands for plants, bio-based products and related educational programs involving topics such as landscape and ornamental plants, sod, bread quality grains, biofuels, organic products, herbs, wine grapes, and other high quality, locally produced plant products. At the same time, loss of farm programs for peanut and tobacco have greatly altered cropping system practices and reduced farm profitability. 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.

This program deals with plants and their uses, and will focus on plants used for commercial and ornamental horticulture, turf, agronomic crops, and grasslands. Plants provide food, animal feed, fiber, medicines, natural products such as oils and latex, and renewable feed stocks for bioenergy production. Plants enliven and sustain environments, provide ornamentals and turf for recreation and aesthetic pleasure, and ecosystem services such as soil protection, nutrient cycling, and wildlife habitat.

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. Extension efforts will focus on participatory learning, adaptation, and adoption of new technologies and practices by targeted clientele. 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
102	Soil, Plant, Water, Nutrient Relationships	15%	15%	15%	15%
201	Plant Genome, Genetics, and Genetic Mechanisms	10%	10%	10%	10%
202	Plant Genetic Resources	15%	15%	15%	15%
205	Plant Management Systems	35%	35%	35%	35%
216	Integrated Pest Management Systems	10%	10%	10%	10%
403	Waste Disposal, Recycling, and Reuse	5%	5%	5%	5%
601	Economics of Agricultural Production and Farm Management	5%	5%	5%	5%
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	5%	5%	5%	5%
	Total	100%	100%	100%	100%

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

Virginia's commercial plant producers are facing increases in land values, costs of production, and environmental regulation. Diseases such as head blight and soybean rust 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 beginning to threaten soil and water quality. Feed grains with reduced phytate-phosphorus, a form which passes through monogastric animals undigested into the manure, are needed to address this imbalance, as are pasture plants with high phosphorus uptake which can be used to extract excess soil nutrients. 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. Development and growth in new home construction is stimulating interest in ornamentals and home gardening.

While 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 program will also address the growing demands and educational needs of lifestyle farms, homeowners, and small businesses. In all cases, development and adoption of environmentally friendly, sustainable production practices will be stressed.

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

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

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
2012	28.6	0.8	30.6	4.0
2013	28.6	0.8	33.0	4.0

Year	Extension		Research	
	1862	1890	1862	1890
2014	29.8	0.8	34.6	4.0
2015	29.8	0.8	34.6	4.0
2016	29.8	0.8	35.8	4.0

V(F). Planned Program (Activity)

1. Activity for the Program

Conduct research experiments on genetic improvement and manipulation of plants, bioprocessing, production systems, and BMP effectiveness. Contribute presentations and scholarly publications to regional, national, and international scientific organizations. Engage with clientele to adapt research products to the production environment. Conduct multi-county and in-depth educational programs and short courses on new plants and plant products, their management, food safety issues, and associated BMPs. Collaborate with other state specialists to develop regional publications in these areas. Maintain demonstration plots of cultural practices, techniques and germplasm adaptability of selected crops. Publish (listserv, web, and mailing) newsletters to provide practical information on pest management, cultural practices, and other research-based aspects of plant management.

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 (Podcasts) ● Other 2 (Extension Publications)

3. Description of targeted audience

The target audience includes Extension educators, commercial producers, policy makers, small businesses, pesticide applicators, homeowners and other plant and food product consumers. Youth, their parents and limited income consumers are targeted through 4-H horticulture programs and community gardening efforts.

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 plants and plant products educational presentations conducted
 - Number of plants and plant products volunteers
 - Number of plants and plant products research citations
 - Number of plants and plant products extension/outreach citations
- 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 the number of commercial producers educated about new plants, cultivated varieties, production techniques or BMPs
2	Increase the number of commercial producers adopting new plants, cultivated varieties, production techniques. or BMPs
3	Increase the number of noncommercial gardeners/producers educated about new techniques or BMPs
4	Increase the number of noncommercial gardeners adopting new techniques or BMPs
5	Number of new cultivated varieties released
6	Increased number of acres dedicated to vegetable and berry specialty crops to enhance agricultural profitability.
7	Increase in the number of commercial producers educated about the reuse, recycling and utilization alternatives for agricultural plastics.
8	Increase the yield, input efficiency (fertilizer, fungicides, insecticides, herbicides, irrigation, etc.), and profit for Virginia vegetable farmers.

Outcome # 1

1. Outcome Target

Increase the number of commercial producers educated about new plants, cultivated varieties, production techniques or BMPs

2. Outcome Type : Change in Knowledge Outcome Measure

2012:11247 2013:11397 2014:11500 2015:12000 2016:12500

3. Associated Knowledge Area(s)

- 102 - Soil, Plant, Water, Nutrient Relationships
- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 202 - Plant Genetic Resources
- 205 - Plant Management Systems
- 216 - Integrated Pest Management Systems
- 403 - Waste Disposal, Recycling, and Reuse
- 601 - Economics of Agricultural Production and Farm Management
- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

4. Associated Institute Type(s)

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

Outcome # 2

1. Outcome Target

Increase the number of commercial producers adopting new plants, cultivated varieties, production techniques, or BMPs

2. Outcome Type : Change in Action Outcome Measure

2012:900 2013:1000 2014:1100 2015:1200 2016:1200

3. Associated Knowledge Area(s)

- 102 - Soil, Plant, Water, Nutrient Relationships
- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 202 - Plant Genetic Resources
- 205 - Plant Management Systems
- 216 - Integrated Pest Management Systems

- 403 - Waste Disposal, Recycling, and Reuse
- 601 - Economics of Agricultural Production and Farm Management

4. Associated Institute Type(s)

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

Outcome # 3

1. Outcome Target

Increase the number of noncommercial gardeners/producers educated about new techniques or BMPs

2. Outcome Type : Change in Knowledge Outcome Measure

2012:320000 **2013:**330000 **2014:**340000 **2015:**350000 **2016:**355000

3. Associated Knowledge Area(s)

- 102 - Soil, Plant, Water, Nutrient Relationships
- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 202 - Plant Genetic Resources
- 216 - Integrated Pest Management Systems
- 403 - Waste Disposal, Recycling, and Reuse

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension

Outcome # 4

1. Outcome Target

Increase the number of noncommercial gardeners adopting new techniques or BMPs

2. Outcome Type : Change in Action Outcome Measure

2012:1700 **2013:**1900 **2014:**2100 **2015:**2300 **2016:**2500

3. Associated Knowledge Area(s)

- 102 - Soil, Plant, Water, Nutrient Relationships

- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 202 - Plant Genetic Resources
- 205 - Plant Management Systems
- 216 - Integrated Pest Management Systems
- 403 - Waste Disposal, Recycling, and Reuse

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension

Outcome # 5

1. Outcome Target

Number of new cultivated varieties released

2. Outcome Type : Change in Action Outcome Measure

2012:5	2013:5	2014:5	2015:5	2016:5
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3. Associated Knowledge Area(s)

- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 202 - Plant Genetic Resources
- 216 - Integrated Pest Management Systems
- 601 - Economics of Agricultural Production and Farm Management

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension

Outcome # 6

1. Outcome Target

Increased number of acres dedicated to vegetable and berry specialty crops to enhance agricultural profitability.

2. Outcome Type : Change in Condition Outcome Measure

2012:29338 2013:29558 2014:28838 2015:30136 2016:31000

3. Associated Knowledge Area(s)

- 102 - Soil, Plant, Water, Nutrient Relationships
- 202 - Plant Genetic Resources
- 205 - Plant Management Systems
- 216 - Integrated Pest Management Systems
- 601 - Economics of Agricultural Production and Farm Management

4. Associated Institute Type(s)

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

Outcome # 7

1. Outcome Target

Increase in the number of commercial producers educated about the reuse, recycling and utilization alternatives for agricultural plastics.

2. Outcome Type : Change in Knowledge Outcome Measure

2012:10 2013:10 2014:10 2015:10 2016:12

3. Associated Knowledge Area(s)

- 403 - Waste Disposal, Recycling, and Reuse

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 8

1. Outcome Target

Increase the yield, input efficiency (fertilizer, fungicides, insecticides, herbicides, irrigation, etc.), and profit for Virginia vegetable farmers.

2. Outcome Type : Change in Condition Outcome Measure

2012:10 2013:10 2014:10 2015:10 2016:11

3. Associated Knowledge Area(s)

- 205 - Plant Management Systems
- 601 - Economics of Agricultural Production and Farm Management

4. Associated Institute Type(s)

- 1862 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.)

Description

Changes in global food production capacity, energy costs, and epidemic diseases could all have unpredictable effects. All external factors affecting personal discretionary spending will affect the implementation of environmentally sound gardening practices and the number of gardeners. Natural disasters may affect producers directly but also will affect homeowner and commercial landscaping which also impacts producers. 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

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 # 15

1. Name of the Planned Program

Sustainable Energy

2. Brief summary about Planned Program

Conduct research and extension programming that educates and explores issues related to renewable energy systems, energy efficiency, feedstock cultivation, efficient harvesting and storage of biomass, network analysis to optimize logistics and minimize delivery costs, and exploration of the consequences of specific policy initiatives. This 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.

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

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

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

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

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
112	Watershed Protection and Management	10%	10%	10%	0%
124	Urban Forestry	10%	10%	10%	0%
132	Weather and Climate	10%	10%	10%	0%
206	Basic Plant Biology	10%	10%	10%	0%
402	Engineering Systems and Equipment	10%	10%	10%	0%
403	Waste Disposal, Recycling, and Reuse	10%	10%	10%	0%
511	New and Improved Non-Food Products and Processes	10%	10%	10%	0%
601	Economics of Agricultural Production and Farm Management	10%	10%	10%	0%
605	Natural Resource and Environmental Economics	10%	10%	10%	0%
610	Domestic Policy Analysis	10%	10%	10%	0%
	Total	100%	100%	100%	0%

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. In 2007, 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 in 2007.

2. Scope of the Program

- In-State Extension
- In-State 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.

2. Ultimate goal(s) of this Program

This comprehensive 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.

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
2012	1.7	0.0	1.6	1.0
2013	1.7	0.5	3.2	1.0
2014	1.8	1.0	3.5	1.0
2015	1.8	1.0	3.5	1.0
2016	1.8	1.0	3.5	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.

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 (You Tube)

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)

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 Train the Trainer and In-service Energy Workshops
 - Number of On-farm Demonstrations
 - Bioenergy Featured Case Studies
 - Number of educational meetings, workshops, conferences, training sessions, and field days
 - Number of fact sheets, publications, newsletters, and other print resources
- 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 the number of individuals using energy more sustainably
3	Increase the number of sustainable energy products
4	Percent increase in the optimization of logistics management for sustainable energy systems
5	Increase number of enterprise budgets related to sustainable energy development

Outcome # 1

1. Outcome Target

Increase farm profitability due to more energy efficient practices

2. Outcome Type : Change in Condition Outcome Measure

2012:2 2013:2 2014:2 2015:2 2016:0

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
- 1890 Extension

Outcome # 2

1. Outcome Target

Increase the number of individuals using energy more sustainably

2. Outcome Type : Change in Action Outcome Measure

2012:400000 2013:400000 2014:400000 2015:400000 2016:0

3. Associated Knowledge Area(s)

- 112 - Watershed Protection and Management
- 124 - Urban Forestry
- 132 - Weather and Climate
- 206 - Basic Plant Biology
- 402 - Engineering Systems and Equipment
- 403 - Waste Disposal, Recycling, and Reuse
- 511 - New and Improved Non-Food Products and Processes
- 601 - Economics of Agricultural Production and Farm Management
- 605 - Natural Resource and Environmental Economics
- 610 - Domestic Policy Analysis

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

Outcome # 3

1. Outcome Target

Increase the number of sustainable energy products

2. Outcome Type : Change in Knowledge Outcome Measure

2012:5 2013:5 2014:5 2015:5 2016:0

3. Associated Knowledge Area(s)

- 206 - Basic Plant Biology
- 402 - Engineering Systems and Equipment

4. Associated Institute Type(s)

- 1862 Research

Outcome # 4

1. Outcome Target

Percent increase in the optimization of logistics management for sustainable energy systems

2. Outcome Type : Change in Knowledge Outcome Measure

2012:10 2013:10 2014:10 2015:10 2016:0

3. Associated Knowledge Area(s)

- 402 - Engineering Systems and Equipment
- 601 - Economics of Agricultural Production and Farm Management
- 610 - Domestic Policy Analysis

4. Associated Institute Type(s)

- 1862 Research

Outcome # 5

1. Outcome Target

Increase number of enterprise budgets related to sustainable energy development

2. Outcome Type : Change in Knowledge Outcome Measure

2012:2	2013:2	2014:2	2015:2	2016:0
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3. Associated Knowledge Area(s)

- 601 - Economics of Agricultural Production and Farm Management
- 605 - Natural Resource and Environmental Economics
- 610 - Domestic Policy Analysis

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
- Appropriations changes
- Public Policy changes
- Government Regulations

Description

Volatile energy prices and the prospect of new carbon policies have heightened awareness of the importance of sustainable energy systems. The recent economic downturn has forced many producers into survival mode. Some producers are more interested than ever to explore energy efficient production systems to control cost and improve their competitiveness, however, financing some of these equipment upgrades and improvements can be a challenge.

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

V(A). Planned Program (Summary)

Program # 16

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
2012	84.2	2.0	0.0	0.0
2013	84.2	2.5	0.0	0.0
2014	87.7	2.5	0.0	0.0
2015	87.7	2.5	0.0	0.0
2016	87.7	2.5	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, 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 leadership development education.
 - Number of clubs where youth are involved in structured after school 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 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.
4	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.
5	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.
6	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.
7	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.
8	4-H Science, Engineering and Technology - Increase the number of 4-H youth that demonstrate sustained learning in science and technology programming.
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 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 trainings that indicate increased knowledge and skills in implementing 4-H programming as a result of participation.

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

2012:300 2013:400 2014:400 2015:500 2016:350

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

2012:400 2013:450 2014:450 2015:500 2016:350

3. Associated Knowledge Area(s)

- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 3

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

2012:1300 2013:1600 2014:1600 2015:1900 2016:1900

3. Associated Knowledge Area(s)

- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 4

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 Action Outcome Measure

2012:500 2013:600 2014:600 2015:700 2016:700

3. Associated Knowledge Area(s)

- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 5

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

2012:15000 2013:15000 2014:15000 2015:15000 2016:17000

3. Associated Knowledge Area(s)

- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 6

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 Action Outcome Measure

2012:5000 2013:6000 2014:6000 2015:7000 2016:7000

3. Associated Knowledge Area(s)

- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

Outcome # 7

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

2012:4000 2013:5000 2014:5000 2015:6000 2016:6000

3. Associated Knowledge Area(s)

- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 8

1. Outcome Target

4-H Science, Engineering and Technology - Increase the number of 4-H youth that demonstrate sustained learning in science and technology programming.

2. Outcome Type : Change in Knowledge Outcome Measure

2012:35000 2013:36000 2014:36000 2015:37000 2016:37000

3. Associated Knowledge Area(s)

- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1890 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 and/or through the 4-H college fair.

2. Outcome Type : Change in Knowledge Outcome Measure

2012:1200 2013:1300 2014:1300 2015:1400 2016:1400

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

2012:800 2013:800 2014:800 2015:900 2016:900

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 Action Outcome Measure

2012:2200 2013:2400 2014:2400 2015:2600 2016:2600

3. Associated Knowledge Area(s)

- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 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 Action Outcome Measure

2012:27000 2013:29000 2014:29000 2015:31000 2016:31000

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 trainings that indicate increased knowledge and skills in implementing 4-H programming as a result of participation.

2. Outcome Type : Change in Knowledge Outcome Measure

2012:70	2013:70	2014:70	2015:70	2016:70
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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

- Natural Disasters (drought, weather extremes, etc.)
- 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, youth, 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 youth 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 4-H 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.