

2017 University of Vermont Combined Research and Extension Plan of Work

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I. Plan Overview

1. Brief Summary about Plan Of Work

Extension Faculty and staff at the University of Vermont Extension (UVM Extension) and faculty and staff at the Agricultural Experiment Station (VT-AES) are focused on meeting the needs of the state's citizens. These experienced and innovative professionals continually work to integrate higher education, research and outreach services to protect and enhance a quality of life characterized by a thriving natural environment, a strong sense of community and a deeply rooted connection to agriculture. Though our research conclusions offer lessons nationwide, even globally, UVM Extension and VT-AES apply the results closer to home, in our own communities, helping people where they live, cultivating healthy communities.

Today, VT-AES and UVM Extension address issues ranging from farm profitability, water and soil quality, and dairy herd disease resistance and health, to global climate change, renewable energy, youth life skills education, community development and planning, and obesity, nutrition and health. Together we concentrate on relevant research that helps our diverse audience--including farmers, forest and land stewards, children and families, rural community members--improve business profitability, environment, economics, nutrition, food safety, and youth and adult life skills development.

Our work is guided and evaluated by dedicated citizen advisors with whom we meet regularly to review priorities, spending, and program impact. We seek additional feedback from those attending UVM Extension events, a periodic state-wide poll, and we meet with university, local, state and national opinion leaders, and policymakers to review our research and outreach portfolio and direction. Research and outreach efforts are enhanced through active partnerships, resources and volunteer workers, as well as by actively seeking for other resources that can extend the work we do.

As we look to the future, VT-AES and UVM Extension see growing opportunities to provide leadership to the University of Vermont's Food Systems initiative. We will continue to explore jointly funded integrated research and outreach projects to enhance the impact of UVM scholarship on supporting community focused food systems. The entire institution is looking for transdisciplinary work that ties food, community and health across teaching, research and outreach. Our two organizations are providing the institutional leadership and are poised to continue to grow our own integrated work in this area in the coming years.

The continuing concern with food borne illnesses and the new rules on food safety have wide ranging impacts on small, diversified farms. There is a growing area of focus on food safety at the field level, processing level and the consumption level by our faculty in an effort to support small agriculture that focuses on serving local communities. Vermont is a small state, however the size of the communities within our boundaries are similar to thousands across the country and world. Understanding how to interact with communities to help them build locally-focused food systems that provide jobs and support the local economy and environment are critical aspects of our ongoing work across the state and region. Our collaborative future is strong in the face of continuing budgetary pressures. As part of multistate efforts, VT-AES and UVM Extension directors have co-funded planning grants to encourage greater multi-state collaboration on issues related to food systems.

The goal of UVM Extension and VT-AES is to put our health, environment, and agricultural research into action resulting in improved agriculture and environmental sustainability, human health, community development and the personal and intellectual development of youth through interdisciplinary and integrated work.

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

Year	Extension		Research	
	1862	1890	1862	1890
2017	55.0	0.0	28.0	0.0
2018	55.0	0.0	28.0	0.0
2019	55.0	0.0	28.0	0.0
2020	55.0	0.0	28.0	0.0
2021	55.0	0.0	28.0	0.0

II. Merit Review Process

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

- External University Panel
- Expert Peer Review

2. Brief Explanation

UVM Extension has entered into a formal agreement with Extension in Maine, Massachusetts, and New Hampshire to develop and implement a four-state web-based planning and reporting system. Through the on-line system, program staff and administrators can access the content of plans in all four states at the organizational level, the team level and for individuals. Extension administrators from each the four states utilize the system to review work that is occurring across the region. Ongoing monthly telephone meetings with the four states are an opportunity for each of the states to provide feedback on specific programs or on the statewide goals and initiatives. The process of developing this shared system has also resulted in discussions around regional programs, opportunities for multistate work, sharing staff resources and a much better understanding of how each of our unique programs are similar and different than others in New England.

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?

In Vermont, our issues of strategic importance include agricultural profitability and diversity; developing rural economics, niche product development; environmental quality, and a healthy and productive population.

We work to help people understand the range of programs we provide and our connection to the knowledge-base of UVM faculty. It is a priority to focus on addressing selected critical problems in Vermont so VT-AES research and UVM Extension programs can yield the greatest impact.

Citizens serve in advisory capacities to ensure that educational programming is targeted and relevant to areas that are important to Vermonters. Working collaboratively, and with other departments of the University, UVM Extension and VT-AES strive to strengthen efforts to ensure that research results, and educational resources remain accessible and relevant to the state's citizens. Advisors' continual check-ins aid us in focusing our work on the relevant problems. Further input is garnered from program participants and other stakeholders giving immediate feedback to a project's focus.

Additionally, UVM's Centers of Excellence help to coordinate, conduct and promote much of the research that is supported by VT-AES funds, competitive private and public grants, sponsorships, and donations. These centers also utilize citizen advisory boards to inform and guide a research and outreach agenda that is responsive to local, state, and national needs and priorities. The Centers of Excellence include:

- **Center for Sustainable Agriculture:** an interdisciplinary approach to integrating university and community expertise to promote sustainable farming systems throughout Vermont and the region.
- **Center for Rural Studies:** connecting information and technical expertise with communities, businesses and policy makers in researching rural issues and information dissemination.
- **Proctor Maple Research Center:** applied research in the production of maple sap and syrup.
- **Dairy Center of Excellence:** an initiative to allow VT-AES to work in tandem with Vermont farms and state and agriculture leaders to tailor research to better serve Vermonters. Some of the research will be conducted in Vermont towns and farms allowing closer relationships and increased research relevancy. It is envisioned to expand this initiative to create a consortium of Northeast universities with similar vision.
- **Food Systems Initiative:** food systems research spans a broad spectrum of topics and disciplines. There is innovative work being done on working landscape, value-added foods, health of communities, among other food system initiatives.

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

Global Foods:

- Women's Agricultural Network provides educational and technical assistance to individuals starting or expanding agricultural businesses; targeted primarily to women who have different experiences than men
- Migrant Education and other programming targets migrant workers providing education access, life skill and English language classes. Programs also assist the workers and their families gain access to healthcare and home gardens providing fresh and familiar food. Fear of immigration, law enforcement, language issues, and lack of transportation are barriers for

these workers to reach out to receive health care. Research studies are focusing on access and education for workers on health care issues.

- New Farmer Program provides programming for new American populations who have a strong history and culture of farming but Vermont's climate and farming practices are new to them.

Childhood Obesity

- Efforts to address community health issues, especially obesity and associated disease, through access of local, fresh food for all income levels will be important. Programs will work with those that serve at-risk clients such as migrant families, low resource families, seniors and those dealing with disease.

- "Food Agency" is a measure of an individual's ability to set and achieve food related goals in life. Researchers are testing this concept with people from rural locations in Vermont with the goal of improving food and health related interventions in schools and communities.

Community Development addresses community strengths and challenges, focusing programs to build assets through its citizens:

- Migrant Education Recruitment Program (MEP) ensures that children of migrant farm workers, and qualifying youth under age 22, are aware of the educational support services available to them. English as a Second Language (ESL) programming is done with translation services to improve employee-employer communication. Health access with the medical school and home gardens in some regions of the state occur to meet workers' daily needs.

- 4-H delivers educational programs to all youth developing life skills with extra effort in place to target urban areas, and offers activities for both teen audiences, as well as limited resource families and youth who are at-risk.

- PROSPER assists communities to build capacity to serve youth who are or might be at-risk.

ADA language is included on all our materials, following federal, state and university policies.

In addition, scholarships and accommodations are available to those wishing to participate in Extension programs, but who do not have necessary resources.

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

Planned programs are developed using the Logic Model, defining outcomes and impacts and the associated indicators of change. Outcomes are written to reflect the ultimate results desired, are achievable by the program, and will usually require multiple years to come to fruition. Intermediate indicators will serve as benchmarks of progress over the duration of the program, and will be reported annually.

The ultimate goals section lists the outcome statements in each of the planned programs. Outcome measures list the outcome indicators. Data reported is taken from our on-line system, representing the sum of individual logic models using shared outcomes, outcome measures and outputs.

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

Beginning with the identification of a situation and the clear articulation of a problem or issue that needs addressing, planned programs set a course of action. Through the use of both process and summative evaluation, the focus shifts from determining activities and inputs, to

improving the learning environment and opportunities for our clientele, and measuring actual achievement of impacts. Tracking program costs will provide additional criterion in determining the efficiency of the program, enabling us to further promote programming that works.

Each planned program is built from organizationally defined outcomes and outcome indicators. Parent Plans (logic model format) focus on issues. They are developed and updated by faculty and program staff. Elements of these Parent Plans are used by individuals as they build individual plans, program logic models resulting in shared efforts to outputs and results to outcome indicators and outcomes. Clearly defined outcomes and measurable indicators create focused programming because they are problem driven and results focused.

The federal plan of work update is reflective of the sum of the actual planned effort of individuals in the organization. This evolution of planning will refine the indicators and outputs. Professional development activities focus on evaluation and program development including evaluation. Evaluation and reporting is focused at mid-term results.

Efforts to focus programming and measurement of results are reflected each year as the planning process occurs annually.

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 traditional stakeholder individuals
- Targeted invitation to selected individuals from general public
- Survey of the general public
- Other (see narrative for details)

Brief explanation.

UVM Extension has a state advisory board with representatives from across the state. The members of this board were drawn from a cross section of disciplines and program areas in which the organization provides educational opportunities. The members of the board have the responsibility to work with the director to review programs, budget decisions and new initiatives within the organization. The members represent UVM Extension and not the individual disciplines or program areas from which they were selected for board discussions.

The board members are given weekly updates on the actions of the director and are encouraged to provide feedback to the director on an on-going basis. In addition, the board members are contacted on an as needed basis, collectively or individually to help provide feedback to the director. The board has two regularly scheduled business meetings per year and participates in the annual legislative reception.

In addition to the state advisory board, regional and local focus groups, surveys, discussions with associations, agencies and non-governmental organizations by the director, associate directors, faculty and/or program staff are all used to gather information from clientele regarding programmatic needs.

The Center for Rural Studies conducts an annual Vermonter Poll, a phone survey of 600 Vermonters.

Faculty and staff work with many partners and program participants who offer input on present and future programming to address identified needs.

For the Vermont Agricultural Experiment Station, our stakeholders include the following:

- College of Agriculture and Life Sciences' Advisory Board
- Vermont Dairy Center of Excellence Advisory Board
- Vermont Maple Industry Council
- Vermont Agency of Agriculture, Food and Markets
- Northeast Organic Farming Association of Vermont (NOFA)
- Vermont Tree Fruit Growers' Association
- Several regional Maple Sugar Makers Associations
- Citizen action groups such as Friends of the Hort Farm

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

1. Method to identify individuals and groups

- Use Advisory Committees
- Use Internal Focus Groups
- Use External Focus Groups
- Use Surveys

Brief explanation.

UVM Extension has a state advisory board with representatives from across the state. The members of this board were drawn from a cross section of disciplines and program areas in which the organization provides educational opportunities. Future efforts will include notices in local popular press and other media to solicit all interested stakeholders. Applications from women and people from diverse racial, ethnic and cultural backgrounds will be encouraged.

The Vermont Agricultural Experiment Station seeks input often from the College of Agriculture and Life Sciences' (CALs) Advisory Board to increase the relevancy of its research programs for Vermont communities, landscapes and human and animal health. This board is a cross section of Vermont and Northeast representatives that form part of our stakeholder groups. We seek input from these stakeholders and colleagues regularly and they consist within the following groups: the Vermont Agency of Agriculture, Food and Markets; various Vermont commodity groups; the UVM Dairy Center of Excellence; and among the agricultural industry groups throughout Vermont and beyond.

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
- Survey of the general public
- Meeting with invited selected individuals from the general public
- Survey of selected individuals from the general public

Brief explanation.

The Vermont Agricultural Experiment Station (VT-AES) collects stakeholder input from regular "Vermont Poll" surveys accomplished through the University of Vermont (UVM) Center for Rural Studies. Also, VT-AES seeks input often from the College of Agriculture and Life Sciences' (CALS) Advisory Board to increase the relevancy of its research programs for Vermont communities, landscapes and human and animal health. This board is a cross section of Vermont and Northeast representatives that form part of our stakeholder groups. We seek input from these stakeholders and colleagues regularly and they consist within the following groups: the Vermont Agency of Agriculture, Food and Markets; various Vermont commodity groups; the new UVM Dairy Center of Excellence; and among the agricultural industry groups throughout Vermont and beyond.

University of Vermont Extension uses regular communication with state advisory board members, encourages staff to work with program advisory groups and to gather participant input about the relevancy, timeliness, methodology, topic and location of programs. Efforts are made to collect feedback that influences program direction via the on-line reporting tool. In response to the Civil Rights review feedback, administration is working to raise staff awareness of tools that might encourage more diverse stakeholders, and the importance of doing so.

3. A statement of how the input will be considered

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

Brief explanation.

V. Planned Program Table of Content

S. No.	PROGRAM NAME
1	Global Food Security and Hunger
2	Community Development and the Personal and Intellectual Development of Youth and Adults
3	Climate Change
4	Sustainable Energy
5	Childhood Obesity
6	Food Safety

V(A). Planned Program (Summary)

Program # 1

1. Name of the Planned Program

Global Food Security and Hunger

2. Brief summary about Planned Program

UVM Extension and VT-AES are continually working to boost agricultural production in Vermont and the region to meet the needs of local communities and those wanting fresh agricultural products in Northeastern urban centers.

The work undertaken has contributed to the growing demand for local and fresh foods in the state and region. This work also incorporates focused activities to make local food accessible to vulnerable populations, as well as educational options that allow those populations to stretch their food dollar. Programs such as Local Foods, Beginning Farmer, Farm Viability, Master Gardener, Women's Ag Network, Food Safety (among others) provide interested residents the ability to grow, use and provide food to other individuals.

In Vermont the working landscape and the quality of its water are primary concerns for its citizens. Food production and care for the land, water and air are tied together as issues. Research and educational outreach must offer solutions that protect business viability, sustainable land and forest management options to protect the environment. This supports a way of life for existing and new populations in Vermont, and raises the expectation of affordable local food access.

Due to integration of VT-AES and UVM Extension, efforts can at times be reported to more than one planned program. For example, while Good Agricultural Practices is teaching food safety based on AES research of best practices, it is also helping producers gain or maintain markets making their business more viable. Those Extension education efforts would be reported to Global Food, and VT-AES results on the research would be captured in the planned program Food Safety.

VT-AES efforts in this planned program include:

- Community Development and planning
- On farm/community energy generation and secondary revenue generation
- Community and technology for rural community development
- Community market development and local foods distribution
- Communication methods and research studies for non-profit and profit organizations
- Agritourism
- Public land management
- Development of environmentally safe, non-food product development (adhesives, plastics and road deicer) from whey
 - Development of Artisan cheese markets
 - Distinctiveness/marketing of regional foods
 - Food by-product development Integrated Pest Management research studies
 - Research studies promoting plant disease resistance and animal health, including biosafety
 - Resources to improve production methods for apple growers

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	5%		0%	
123	Management and Sustainability of Forest Resources	4%		0%	
133	Pollution Prevention and Mitigation	31%		2%	
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants	0%		6%	
205	Plant Management Systems	4%		13%	
206	Basic Plant Biology	0%		8%	
211	Insects, Mites, and Other Arthropods Affecting Plants	0%		8%	
216	Integrated Pest Management Systems	5%		7%	
302	Nutrient Utilization in Animals	0%		5%	
305	Animal Physiological Processes	0%		6%	
308	Improved Animal Products (Before Harvest)	0%		7%	
313	Internal Parasites in Animals	0%		3%	
315	Animal Welfare/Well-Being and Protection	0%		8%	
402	Engineering Systems and Equipment	2%		0%	
601	Economics of Agricultural Production and Farm Management	30%		15%	
602	Business Management, Finance, and Taxation	10%		2%	
604	Marketing and Distribution Practices	4%		2%	
605	Natural Resource and Environmental Economics	3%		3%	
723	Hazards to Human Health and Safety	2%		0%	
802	Human Development and Family Well-Being	0%		5%	
	Total	100%		100%	

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

1. Situation and priorities

Situation and priorities from each of the Parent plans (problem driven logic models) as follows:

From Environmental Sustainability: communities, business including agricultural and forest landowners and operators, and homeowners protect the environment:

Agriculture in Vermont is becoming more highly diversified and represents a critical component of this state's revenue. The fundamental character of Vermont is reflected in its agricultural working landscape which symbolizes a way of life strongly cherished by its citizens. The stakeholders of Vermont's agriculture encompass all the state's citizens, including the general public and a diverse group of growers, farmers, landscapers and practitioners involved with working on or for the land. These stakeholders recognize the value of Vermont's agriculture and the need to increase their knowledge and improve their skills to ensure its environmental and economic sustainability, thereby protecting air, water, soil, and human health resources. As a result of climate change and increased mobility of people and products, there is an increased threat of new and invasive pests and diseases impacting agriculture and the landscape in Vermont. Extension programs and personnel address critical stakeholder issues by disseminating essential current science-based information to a broad range of audiences to increase their knowledge and skills and encourage implementation of cost-effective, environmentally sound sustainable agricultural practices.

Improved knowledge and skills required to ensure sustainability of farms, landscapes and communities include:

- Pest management practices including pest identification and pest management using a variety of tools employing least toxic practices (Integrated Pest Management/IPM).
- Safe and judicious use of pesticides
- Nutrient management
- Invasive pest identification and awareness
- Organic management concepts, strategies and practices

From Economic sustainability of farms, forests, and other enterprises:

Both the economy and the environment consistently top the list of Vermonters' concerns, according to the annual Vermonter Poll (2008). These findings correspond with a recent survey undertaken as part of the Council on the Future of Vermont, a project of the Vermont Council on Rural Development. The goal of the project was to promote public dialogue on values, challenges, opportunities, priorities and visions for Vermont. Survey findings include rankings of the top seven highest rated values and challenges (Center for Rural Studies, August 2008, http://www.uvm.edu/crs/reports/2008/CFV_Full_Report.pdf). Respondents placed the greatest value overall on "the state's working landscape and heritage." The greatest challenges were "the increasing costs of living, such as transportation, heating and electricity," followed closely by "the health and viability of Vermont farms and the agricultural sector."

Clearly, economic opportunities that support the working landscape are needed throughout the state. The Vermont Sustainable Agriculture Council's 2009 Annual Report and Recommendations (<https://www.uvm.edu/sustainableagriculture/council/SAC2009Report.pdf>) focus on two primary areas: strengthening Vermont's local food system and enhancing on-farm energy alternatives. Improved knowledge and skills leading to adoption of new practices can promote economic sustainability of farms, forests, natural-resource based enterprises, and communities.

Specific problems that need to be addressed include:

- Lack of adequate business planning by farm and forest land owners threatens their future financial security and business viability.
- Ag producers and other enterprises are not reaching their profit potential through marketing and management practices.
- Lack of production education and research can decrease profitability of enterprises (e.g., organic dairy farms).
- Price and supply of fuel poses economic risk to farmers and rural communities
- Tax preparers are challenged to maintain competency with tax laws.

University of Vermont Extension is uniquely positioned to deliver programs that integrate the latest research on agriculture, forestry and enterprise development with practical applications at the community and individual business level.

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

From Environmental Sustainability: communities, business including agricultural and forest landowners and operators, and homeowners protect the environment:

- Growers will choose to learn about Integrated Pest Management (IPM) vs. standard pest management practices. Growers want to use pesticides safely, wisely and as a last resort.
- Farmers will choose to learn about soil building vs. standard soil practices.
- Growers want to decrease use of chemical pesticides and believe IPM will help them.
- Growers will invest time and money in IPM and want to learn more about how to use it effectively.
- IPM tactics exist to address the pest management problems in Vermont.

From Economic sustainability of farms, forests, and other enterprises:

- Differences between low-yielding and high-yielding sap collection systems can often be attributed to education, as the maple producer who may have purchased the necessary equipment often does not understand the steps necessary for its proper installation and maintenance.
- The inability to meet quality standards in maple production is rarely caused by a failure to use new technology or failure to adopt the latest sap collection or boiling methods. Instead, it is directly related to lack of education about producing quality syrup.

- There still is a trend and place in Vermont for large dairy farm operations.
- Environmental regulations are only getting tighter, therefore making it increasingly difficult for all dairy operations.
 - Due to niche marketing, value added products, the organic market, and Vermont's proximity to large markets, there should always be dairy farms in Vermont.
 - Education and research in organics will help farmers improve profitability. Organic dairy farmers will be able to add another enterprise to farm.
 - Price of fuel will remain unstable in the future. Price of fuel will continue to pose an economic risk to farmers. Economic advantages of on-farm biodiesel production will increase.
 - The rate of adoption of dairy farm practice changes are influenced by farm profitability and personal beliefs in the value of any proposed changes in farm management.
 - State and federal tax laws and regulations will continue to change, and that practitioners will continue to need good information that is reasonably-priced.
 - Many farmers start their business with no plan; sometimes they expand from a hobby, or take-over the family farm, then find themselves needing to borrow money or make a large change. Farmers would benefit from having a plan in place to help navigate these unexpected challenges.
 - The travel and tourism industry in Vermont is growing rapidly and may soon become the largest industry in Vermont if trends continue. This rapid growth provides both challenges and opportunities for Vermont's working landscape and rural communities.
 - Public interest in sourcing local foods extends into beverages and the demand for local hops, wines, and ciders have continued to rise. Environmentally safe methods for pest management are being studied.
 - Funding is available, but likely attained through cooperative efforts.

2. Ultimate goal(s) of this Program

Improve agricultural and environmental sustainability (Condition)

- Individuals and business owners take actions that improve their economic sustainability while minimizing their impact on the environment (Action)
- Individuals and business owners take actions that comply with environmental quality laws and/or protect natural resources (Action)

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
2017	29.9	0.0	15.0	0.0
2018	29.9	0.0	15.0	0.0
2019	29.9	0.0	15.0	0.0
2020	29.9	0.0	15.0	0.0
2021	29.9	0.0	15.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

Project listed in bold followed by delivery methods

- **Ag Business Management.** Conferences, courses, consultations and farm visits.
- **Agricultural safety.** Courses, consultations and farm visits.
- **Beginning Farmer Initiative.** Focus groups, learning circles, workshops, mini-courses and publications.
- **Community Preparedness.** Workshops and discussion groups.
- **Engineering for Food Production, Harvest and Storage.** Consultations, workshops, various media.
- **Extension Master Gardener.** Course, train the trainer.
- **Farm and Forest Transfers.** Workshops, consultations, farm visits.
- **Farm Viability.** Farm visits, consultations.
- **Farming Alternatives.** Workshops, consultations, farm visits.
- **Forage and Pasture Management Education.** Conference, farm visits, consultations.
- **Good Agricultural Practices (GAP).** Consultations, workshops.
- **Ground Work. Building Capacity to Provide Tractor Education.** Workshops, curriculum development.
- **Livestock Production and Products.** Consultations, discussion groups, workshops.
- **Maple Program.** Conference, workshops, newsletter.
- **Nutrient Management Program.** Farm visits, consultations.
- **Organic Grain Project.** Demonstrations, data gathering.
- **Pest Management Education.** Integrated Pest Management (IPM) and Pesticide Education and Safety Program (PESP) training.
- **Private/Commercial Landowner and Industry Professional Education.** Tour and conference.
- **Soil Health.** Workshops.
- **Sustainable Forests.** Classes, workshop series, various media.
- **UVM Tax School.** Conference, tax book.
- **Vegetable and Berry Growers.** Consultations, farm visits, meetings, various media, presentations, website.
- **Vermont New Farmer Network.** Conference, networking, consultations.
- **Vermont Pasture Network.** Pasture walks, demonstrations and trials, conference, consultations, various media.
- **Vermont Tourism and Recreation.** Research, conference.
- **Women's Agricultural Network.** Newsletters, website, classes, workshops, individual and small group consultations.

AES Efforts:

- **Animal Manure Treatment Systems**
- **Storm and Wastewater Management Systems**
- **Perturbation of soil ecosystems by anthropomorphic interventions**
- **Soil nutrient effect on forest ecosystem productivity and lake water quality**
- **Soil fertility/chemistry/physical problems associated with waste disposal and bioremod faction**

- **Economics of organic dairy, crop management and alternative energy**
- **Heifer nutrition, rearing and management**
- **Dairy nutritional immunology**
- **Small ruminant production and management systems**
- **Development of strategies to address applied equine issues**
- **Biofuels from coconuts and other energy sources**
- **Identification of genetic traits that make species invasive**
- **Surveillance and prevention of spread of Asian Longhorned Beetle**
- **Management of thrips pests in forests and greenhouses**
- **Identification/control of fungal propagation**
- **Fungal biological plant protection, collection and management**
- **Explore microbial pesticides and fungal components as IPM strategies**
- **Innate immunity, DNA-based vaccines and mastitis prevention**
- **Hormonal regulation of glucose synthesis and milk production**
- **Functional genomics and photoperiod effects on hormonal cycles/milk production**

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 (Train the Trainer) • Other 2 (Presentation/field days) 	<ul style="list-style-type: none"> • Newsletters • TV Media Programs • eXtension web sites • Web sites other than eXtension • Other 1 (Publication- professional/peer)

3. Description of targeted audience

- Adults
- Agriculture/Natural Resources: Watershed Based Organizations
- Agriculture: CCA & Crop Consultants
- Agriculture: Crop Producers

- Agriculture: Dairy Producers
- Agriculture: Farm Employees
- Agriculture: Farm Families
- Agriculture: Farm Managers
- Agriculture: Farmers
- Agriculture: Goat & Sheep Producers
- Agriculture: Greenhouse Ornamental Growers
- Agriculture: Home Gardeners
- Agriculture: Industry Professionals
- Agriculture: Livestock producers
- Agriculture: Maple Industry
- Agriculture: Maple Sugar Producers
- Agriculture: Non-Dairy Producers
- Agriculture: Nursery operators
- Agriculture: Ornamentals Industry Professionals
- Agriculture: Service Providers
- Agriculture: Small Fruit & Vegetable Growers
- Agriculture: Veterinarians
- Agriculture: Dairy Goat, Meat Goat and Dairy Sheep Producers

V(G). Planned Program (Outputs)

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

- Number of contacts
 - Direct Adult Contacts
 - Indirect Adult Contacts
 - Direct Youth Contacts
 - Indirect Youth Contact
 - Number of patents submitted
 - Number of peer reviewed publications
- Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(H). State Defined Outputs

1. Output Measure

- Class/course
- Conference
- Consultation
- Consumer publication
- Demonstration
- Discussion group
- Educational/evaluation instrument
- Electronic communication/phone
- Field day/fair
- Field site visit
- Funding request
- Presentation
- Publication - curriculum
- Publication - fact sheet
- Publication - magazine article
- Publication - manual
- Publication - newsletter
- Publication - newspaper/article
- Research project
- TV segment/Across the Fence (ATF)
- Publication - technical
- Tour(s)

- Mass Media - blog post/social media/web page/internet site development and updating
 - Workshop - series
 - Workshop - single session
- 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 farmers that develop a nutrient management plan protecting water and soil
2	Number of Master Gardener participants who earn certification and apply IPM and plant diagnostic skills with home gardeners, youth and community members
3	Number of farmers who implement best agricultural practice(s) improving crop/pasture, product, and/or soil productivity while protecting water, air, soil and/or other natural resource
4	Number of individuals who implement IPM practice(s) increasing the protection of water, air and/or soil
5	Number of individuals and business owners who implement recommended practice(s) that accomplish owner values and goals to improve/protect business sustainability
6	Number of individuals who complete a plan including preventative measures to secure animal health, food safety and public health protecting the food chain and market integrity
7	Number of growers who adopt new crop/plant variety(ies) resulting in maintaining or increasing sales
8	Number of individuals who complete a business plan, start a business (within 18 months of planning) based on personal values, goals and business viability
9	Number of participants who make an intentional, informed decision regarding starting a business based on feasibility, personal goals and values
10	Number passing the USDA GAPs audit to gain or maintain a market for their locally grown crop(s)
11	Number of growers growing organic crops increase revenues improving business sustainability
12	Number of producers who implement produce safety/food safety plans/practices to gain or maintain a market for their locally grown crop(s)
13	Number of farmers who implement key element(s) of their nutrient management plan protecting water and soil
14	Number of farmers who report that accessibility, cost, and associated challenges of child care are factors in their success and wellbeing
15	Number of small parcel (under 25 acres) forest landowners implementing stewardship/management activities to minimize the threat of forest fragmentation.
16	Number of identified new and sustainable disease and arthropod pest management strategies for organic agricultural growers

Outcome # 1

1. Outcome Target

Number of farmers that develop a nutrient management plan protecting water and soil

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 133 - Pollution Prevention and Mitigation

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 2

1. Outcome Target

Number of Master Gardener participants who earn certification and apply IPM and plant diagnostic skills with home gardeners, youth and community members

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 205 - Plant Management Systems
- 216 - Integrated Pest Management Systems

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 3

1. Outcome Target

Number of farmers who implement best agricultural practice(s) improving crop/pasture, product, and/or soil productivity while protecting water, air, soil and/or other natural resource

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 112 - Watershed Protection and Management
- 133 - Pollution Prevention and Mitigation
- 402 - Engineering Systems and Equipment
- 601 - Economics of Agricultural Production and Farm Management

- 602 - Business Management, Finance, and Taxation

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 4

1. Outcome Target

Number of individuals who implement IPM practice(s) increasing the protection of water, air and/or soil

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 133 - Pollution Prevention and Mitigation
- 205 - Plant Management Systems
- 216 - Integrated Pest Management Systems

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 5

1. Outcome Target

Number of individuals and business owners who implement recommended practice(s) that accomplish owner values and goals to improve/protect business sustainability

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 112 - Watershed Protection and Management
- 133 - Pollution Prevention and Mitigation
- 205 - Plant Management Systems
- 216 - Integrated Pest Management Systems
- 315 - Animal Welfare/Well-Being and Protection
- 601 - Economics of Agricultural Production and Farm Management
- 602 - Business Management, Finance, and Taxation
- 604 - Marketing and Distribution Practices
- 605 - Natural Resource and Environmental Economics
- 723 - Hazards to Human Health and Safety

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 6

1. Outcome Target

Number of individuals who complete a plan including preventative measures to secure animal health, food safety and public health protecting the food chain and market integrity

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 604 - Marketing and Distribution Practices
- 723 - Hazards to Human Health and Safety

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 7

1. Outcome Target

Number of growers who adopt new crop/plant variety(ies) resulting in maintaining or increasing sales

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 205 - Plant Management Systems
- 602 - Business Management, Finance, and Taxation

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 8

1. Outcome Target

Number of individuals who complete a business plan, start a business (within 18 months of planning) based on personal values, goals and business viability

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 601 - Economics of Agricultural Production and Farm Management

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 9

1. Outcome Target

Number of participants who make an intentional, informed decision regarding starting a business based on feasibility, personal goals and values

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 601 - Economics of Agricultural Production and Farm Management

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 10

1. Outcome Target

Number passing the USDA GAPs audit to gain or maintain a market for their locally grown crop(s)

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 604 - Marketing and Distribution Practices

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 11

1. Outcome Target

Number of growers growing organic crops increase revenues improving business sustainability

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 601 - Economics of Agricultural Production and Farm Management

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 12

1. Outcome Target

Number of producers who implement produce safety/food safety plans/practices to gain or maintain a market for their locally grown crop(s)

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 604 - Marketing and Distribution Practices

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 13

1. Outcome Target

Number of farmers who implement key element(s) of their nutrient management plan protecting water and soil

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 133 - Pollution Prevention and Mitigation
- 602 - Business Management, Finance, and Taxation

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 14

1. Outcome Target

Number of farmers who report that accessibility, cost, and associated challenges of child care are factors in their success and wellbeing

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 601 - Economics of Agricultural Production and Farm Management

4. Associated Institute Type(s)

- 1862 Research

Outcome # 15

1. Outcome Target

Number of small parcel (under 25 acres) forest landowners implementing stewardship/management activities to minimize the threat of forest fragmentation.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 123 - Management and Sustainability of Forest Resources

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 16

1. Outcome Target

Number of identified new and sustainable disease and arthropod pest management strategies for organic agricultural growers

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 205 - Plant Management Systems
- 206 - Basic Plant Biology
- 216 - Integrated Pest Management Systems

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

Description

Parent Plan: communities, business including agricultural and forest landowners and operators, and homeowners protect the environment:

- Soil building takes time and on some farms, investments in soil quality will take more than the duration of the project to show results.
- Growers are receptive to expand their use of IPM, but make changes in their production practices slowly to reduce negative impacts.
- New pesticides, biological controls and other effective IPM tactics are still being tested, and need to be assessed under field conditions before they are broadly adopted.
- The costs of some IPM practices are considerably higher than chemical pesticides which reduce adoption by growers.
- Customers in general have limited knowledge of IPM, though they are willing to pay more for IPM produced products when informed of the benefits of this production approach.

Parent Plan: economic sustainability of farms, forests, and other enterprises:

- Costs of production inputs
- Prices received for products sold
- New laws and regulations are being introduced, and enforced almost constantly. The time has come when compliance is no longer voluntary but necessary.

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

Every individual plan of work is logic model based, including targets for outcome indicators. A part of setting targets is laying out an evaluation plan. Evaluation results are reported in the accomplishment report against outcomes and in narratives. Post event surveys and evaluations completed by repeat attendees of annual events are asked about changes made as a result of something learned at the previous events. Observations, interviews, and other evaluation strategies are used to collect changes made, as well as resulting impacts experienced by program participants. Evaluation occurs at most educational events assessing participant knowledge and skills gained.

V(A). Planned Program (Summary)

Program # 2

1. Name of the Planned Program

Community Development and the Personal and Intellectual Development of Youth and Adults

2. Brief summary about Planned Program

Extension addresses community engagement, economic development, the identification of community assets and challenges to create sustainable and viable communities. Programming focuses on engaging youth in communities through service, building skills of business and community leaders, and building supports to meet the needs of the communities' underserved or at-risk populations.

The UVM Extension 4-H program operates in all fourteen counties in Vermont, and teaches youth leadership, citizenship and life skills through a variety of well-tested delivery modes. All programs are based on learning-by-doing approaches--the experiential model--that allow youth to experience mastery in subject matter, a sense of belonging to a group, a sense of generosity to those around them, and a sense of independence, with opportunities to take on leadership and make important decisions.

Projects under this planned program are designed to bring together people with diverse interests to share perceived problems, find common ground, and identify resources and tools for prioritizing and solving those problems through a cooperative, collaborative effort.

Two-thirds of participants live in towns with fewer than 10,000 people, and an additional 12% live on farms, reflecting the rural and small-town audiences primarily served. Over half of all youth served live in racially and ethnically mixed communities. Families at risk are served through Coping with Separation and Divorce (COPE), PROSPER, and Migrant Education programs. Extension efforts also support leadership in local government, protection of urban forests by trained volunteers, and support for other community-identified needs.

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
124	Urban Forestry	7%		0%	
608	Community Resource Planning and Development	16%		0%	
802	Human Development and Family Well-Being	11%		0%	
805	Community Institutions and Social Services	10%		0%	
806	Youth Development	56%		0%	
	Total	100%		0%	

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

1. Situation and priorities

Situation and priorities from each of the Parent Plans (problem driven logic models) are as follows:

Parent Plan: provide opportunities for positive youth and family development:

4-H programming combines the experiential learning model with project-based education, both key strategies for Positive Youth Development identified in Critical Hours (Miller, 2003). Project-based curriculum is focused on life skills education over 6-8 hours of sequential learning and perhaps years of contact with a trained volunteer leader. Through these opportunities, youth gain a sense of belonging, sense of mastery, sense of independence, and an opportunity to help others (sense of generosity). After school and out of school programs make a positive difference for youth participants. Effects of the programming are stronger "for those individuals who need the help most and have the fewest options" (Miller, 2003 p.59). The greatest benefit is for those who attend the most hours over the most years. This is even more important for older youth, as there are fewer opportunities for teens as they age outside of school. The Tufts Study on Positive Youth Development indicates that "combining sports and youth development programs such as 4-H, Boys and Girls Clubs, YMCA, Big Brothers/Big Sisters, Scouting, etc..., was one of the most effective ways to promote positive youth development and to prevent problems" (Lerner, p9, 2008).

Personal mastery of Life Skills (Targeting Life Skills Model, 1998) is important for both Positive Youth and Family Development. Life Skills are abilities individuals can learn that will help them to be successful in living a productive and satisfying life. The goal is to provide developmentally appropriate opportunities for youth and adults to experience life skills, to practice them until they are learned, and be able to use them as necessary throughout a lifetime. Through the experiential learning process, youth and adults internalize the knowledge and gain the ability to apply the skills appropriately. Our programming will focus on eight of these Life Skills including: decision making; wise use of resources; communication; accepting differences; leadership; useful/marketable skills; healthy lifestyle choices and self-responsibility.

American Youth are losing ground in science, technology, engineering, art and math (STEAM) compared to peers in other nations. Although the United States is currently the world's economic and military leader, too many young Americans do not have the science, technology, engineering, art and math career skills

necessary to succeed and meet our country's needs in the future. A recent report of the National Academy of Sciences (2006), *Rising Above the Gathering Storm*, speaks to the urgent need to enhance academic and vocational experiences in STEAM. American inventiveness and competitiveness in the global marketplace are at risk as student interest and performance in STEAM disciplines declines at the same time that STEAM literacy and mastery expectations rise (Business Roundtable, 2005). The increasing pace and complexity of life in a technological age demands engaged, innovative, and cooperating citizens" (Silliman, 2007).

When families undergo major transitions such as changing caregivers, separation and divorce, parents benefit from ideas and strategies to lessen the impact of the changes on the children.

Parent Plan: Provide positive community engagement opportunities for youth and adults:

Studies indicate a number of problems ranging from declining levels of voter participation and public apathy toward elections to decreasing interest in volunteer activities and community groups. They also document the younger generation's apparent disinterest in public affairs and lack of knowledge about our political system. Robert Putnam has quantified this civic disengagement, documenting a 25-30 year decline in membership in civic-oriented organizations. In his book, *Bowling Alone*, Putnam states that, "Americans' affiliations with civic institutions with a face-to-face quality - from churches to service groups like Kiwanis and PTAs - have declined over the last generation."

Youth in Decision-Making: A study on the impacts of youth on adults and organizations (Zeldin, McDaniel, Topitzes, and Calvert, 2000) states, "Expanding community capacity means that a variety of organizations and agencies have to involve young people in decision-making. This has not yet happened ... as more organizations adopt youth governance into their operating philosophy in the future, a critical mass of expertise will grow." In addition, the connection of youth development to community development is critical; by integrating youth into their communities, they feel empowered, relevant and valued. In return, the community benefits from vital services provided by the youth.

Paul Woodruff in *First Democracy: The Challenge of an Ancient Idea* (2005) presents significant challenges for our current educational system, which focuses on preparing our young people for the job market, but fails in teaching good citizenship. Citizenship education is a mission mandate area for 4-H Youth Development programming (4-H National Headquarters) in hopes that 4-H youth step into leadership roles and affect change at community level.

Cornelia and Jan Flora (2008) developed the **Community Capitals Framework** as an approach to analyze how communities work. Based on their research to uncover characteristics of entrepreneurial and sustainable communities, they found that the communities most successful in supporting healthy sustainable community and economic development paid attention to all seven types of capital: natural, cultural, human, social, political, financial and build. **Human Capital** is the focus of our work with youth and families; developing the skills and abilities of people, as well as the ability to access outside resources and bodies of knowledge in order to increase understanding and to identify promising practices. Human capital also addresses leadership's ability to "lead across differences," to focus on assets, to be inclusive and participatory, and to be proactive in shaping the future of the community or group.

The Migrant Education Recruitment Program (MEP) serves children and youth who move with family member(s) or guardian(s) to obtain or in search of temporary or seasonal work in agriculture or logging. MEP recognizes that a positive relationship between parents and school is essential to the success of a child's academic life. In order to further and support this positive relationship, MEP offers statewide support to migrant families.

Urban and community forests provide ecological services that benefit the environmental, economic and

social conditions of Vermont communities. This resource includes trees in our backyards, along our streets, in parks and town greens and in municipal forests. These urban forests can directly enhance the atmosphere and transform the surrounding environment through carbon dioxide (CO₂) reduction and energy conservation, airborne pollutant absorption and interception, and microclimate modifications. They protect and enhance water quality and supply by filtering out pollutants, controlling stormwater runoff, enabling water infiltration and reducing erosion. They can help offset the high costs of fossil fuel consumption by reducing dependence on summer air conditioning and winter heating. They improve the economic development through increases in property values, rental occupancy rates, consumer patronage and expenditure, and job market.

When urban and community forests are well planned and managed, communities can begin to reap the many benefits they provide. These benefits may not seem important to a state that is approximately 78% forested, but with 38% of Vermont's residents living in urban areas the need to better advocate for this public resource is becoming increasingly evident. Furthermore, with the increasing urbanization of Vermont, up 22% from 1990, the canopy cover over Vermont communities is decreasing and in many cases the resource is in poor health. As the state continues to develop and we strive to keep our downtowns vibrant, our urban and community forests become more important.

Youth and adults need opportunities to develop a set of skills to effectively engage with their community to affect change. It is just this development of Human Capital that Extension proposes to address with targeted programming.

2. Scope of the Program

- In-State Extension
- Multistate Extension

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

1. Assumptions made for the Program

Bold header is group plan name (issue or problem being addressed) with assumption(s) listed below:

Parent Plan: provide opportunities for positive youth and family development:

- 4-H: materials included in the 4-H National Curriculum Collection address Life Skills education; more hours of programming with a caring adult carries a greater benefit; youth in limited resources families have fewer options for opportunities to gain mastery of life skills.
- STEAM: much of the success will depend upon partnering and pooling resources with businesses and colleagues in STEAM related organizations.
- COPE: The program will be mandated by the court system.

Parent Plan: Provide positive community engagement opportunities for youth and adults:

- Community Organizations and Agencies collaborate with UVM Extension to enhance programming for youth.
- Volunteers are available to assist in program delivery for community youth.
- Youth want to engage with community organizations and agencies to address issues of the youth population.
- It is believed that participants will gain leadership skills and develop successful projects that will

enable them to move their communities toward solving self identified issues.

2. Ultimate goal(s) of this Program

A Larger and more diverse pool of youth are pursuing STEAM careers through post secondary education and improved STEAM literacy in the general population. (Condition)

- Youth apply STEAM learning in their lives and demonstrate interests and aspirations toward STEAM careers

Improve community collaboration to address issues and build community assets. (Condition)

- Community members or community groups/organizations effectively mobilize to better understand and solve community problems
- Citizens participate in local government and/or community groups where policy decisions are made.

Improve personal and intellectual development of Vermont youth. (Condition)

- Families under transition acknowledge and mitigate the impact of changes on their children.
- Youth and adults gain mastery of life skills.
- Youth are involved in communities as active, productive citizens.

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
2017	17.1	0.0	0.0	0.0
2018	17.1	0.0	0.0	0.0
2019	17.1	0.0	0.0	0.0
2020	17.1	0.0	0.0	0.0
2021	17.1	0.0	0.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

4-H Positive Youth Development Program: help youth acquire Life Skills in the following areas: decision making; critical thinking; problem-solving; communication; goal-setting; and skills for everyday living to succeed as adults. Delivery Methods: 6-8 sequential learning hours using experiential learning techniques for in-school, afterschool, or out-of-school settings

Science, Technology, Engineering, Art and Math (STEAM) Activities: 4-H STEAM will begin to show how science and engineering issues affect youths' lives and prepare a future generation of scientists and

engineers. The 4-H STEAM program will present 4-H with a new opportunity to connect to the Land Grant University's STEAM research community and integrate with current youth workforce development initiatives.

Community Leadership: Assessing, addressing and expanding community capacity through leadership and public policy education efforts including building coalitions and collaboratives, and educating their members and clientele.

Coping with Separation and Divorce (COPE): Parent education for parents of minor children who have filed for separation, divorce, dissolving of a civil union, parentage, changes in rights and responsibilities concerning their children. This is a court mandated program.

Migrant Education Recruitment Program (MEP): To ensure that children of migrant farm workers, and qualifying youth under age 22, are aware of the educational support services available to them. Delivery Methods: outreach to schools, agricultural employers, and social service agencies throughout the state.

Vermont Urban and Community Forestry Program: A joint initiative between UVM Extension and the Department of Forests, Parks and Recreation. The mission of the program is to promote the stewardship of the urban and rural landscapes to enhance the quality of life in Vermont communities. The program provides educational, technical and financial assistance in the management of trees and forests, in and around the built landscape as well as First Detector education for invasive pests. Delivery Methods: Classes, meetings, various media, community volunteer projects.

PROSPER: [PROMoting School-community-university Partnerships to Enhance Resilience]: PROSPER is a delivery system of evidence-based programs for the purpose of improved child and family outcomes such as long-term reductions in substance use; reduced youth behavior problems; and long-term effects on school engagement and academic success, with similar benefits occurring for both low- and high-risk groups.

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 (Train the Trainer) ● Other 2 (4-H Afterschool, club) 	<ul style="list-style-type: none"> ● Newsletters ● TV Media Programs ● Web sites other than eXtension ● Other 2 (radio ed. spots)

3. Description of targeted audience

- 4-H Leaders (Adult)
- 4-H: Adult Volunteers
- 4-H: Camp Board Directors

- 4-H: Youth Volunteers
- Adults
- Age 6 - 18 Youth
- Age 19 - 24 Young Adult
- Age 25 - 60 Adult
- Agriculture: Industry Professionals
- Agriculture: Government Agency Personnel
- Communities: Cities and Towns
- Communities: Educators
- Communities: Local Officials/Leaders
- Communities: Non-Governmental Organizations
- Communities: Schools
- Community leaders and citizens
- Extension: Faculty/Staff
- Forestry: Woodland Managers/Foresters
- Funders
- Policy Makers: Legislators
- Public: Families
- Public: General
- Public: Nonprofit Organizations
- Public: Parents
- Public: Small Business Owners/Entrepreneurs
- Train-the-Trainer recipients (Adults)
- USDA personnel
- 4-H Community or Project Clubs Participants (Youth)
- 4-H Special Interest or Short-Term Program Participants (Youth)
- 4-H Youth (Youth)
- Migrant In School Youth
- Migrant Out of School Youth
- School Enrichment Program Participants (Youth)

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

- 4-H Afterschool
- 4-H Club
- 4-H Day Camp
- 4-H Overnight Camp
- 4-H School Enrichment
- 4-H Short-term/special interest
- Class/course
- Conference
- Consultations
- Discussion Group
- Field Site Visit
- Funding request
- Presentations
- Publication - fact sheet
- Publication - newsletter
- Publication - newspaper/article
- TV segment/Across the Fence (ATF)
- Train the Trainer sessions
- Workshop - series
- Workshop - single session
- Trainee Delivered Programming
- Mass Media: blog post/social media/web page/internet site updating

- 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 eligible migrant youth enrolled in the Vermont Migrant Education Program
2	Number of individuals (youth and volunteers) in short term and/or afterschool programs increase STEAM related knowledge and/or skills in content and careers
3	Number of parents undergoing family transition through parentage, divorce or separation who understand the impact of these changes and their behavior on their children.
4	Increase in number of youth reached with positive youth development programming demonstrate mastery for targeted life skills, including: decision making; wise use of resources; communication; accepting differences; leadership; useful/marketable skills; healthy lifestyle choices; and/or self-responsibility
5	Number of volunteers and staff demonstrating new techniques/activities in clubs and programs to better prepare youth to develop life and job skills, learned through 4-H training and development
6	Number of individuals who use skills and effectively participate in addressing community issue(s) (e.g. green infrastructure, local leadership, hunger, volunteerism, etc.)
7	Number of participants who are English language learners increase their level of English proficiency
8	Number of communities or community group/organization(s) establishing or expanding projects to improve or mitigate a community issue

Outcome # 1

1. Outcome Target

Number of eligible migrant youth enrolled in the Vermont Migrant Education Program

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 805 - Community Institutions and Social Services
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 2

1. Outcome Target

Number of individuals (youth and volunteers) in short term and/or afterschool programs increase STEAM related knowledge and/or skills in content and careers

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 3

1. Outcome Target

Number of parents undergoing family transition through parentage, divorce or separation who understand the impact of these changes and their behavior on their children.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 802 - Human Development and Family Well-Being

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 4

1. Outcome Target

Increase in number of youth reached with positive youth development programming demonstrate mastery for targeted life skills, including: decision making; wise use of resources; communication; accepting differences; leadership; useful/marketable skills; healthy lifestyle choices; and/or self-responsibility

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 5

1. Outcome Target

Number of volunteers and staff demonstrating new techniques/activities in clubs and programs to better prepare youth to develop life and job skills, learned through 4-H training and development

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 6

1. Outcome Target

Number of individuals who use skills and effectively participate in addressing community issue(s) (e.g. green infrastructure, local leadership, hunger, volunteerism, etc.)

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 124 - Urban Forestry
- 608 - Community Resource Planning and Development
- 802 - Human Development and Family Well-Being
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 7

1. Outcome Target

Number of participants who are English language learners increase their level of English proficiency

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 802 - Human Development and Family Well-Being
- 805 - Community Institutions and Social Services
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 8

1. Outcome Target

Number of communities or community group/organization(s) establishing or expanding projects to improve or mitigate a community issue

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 124 - Urban Forestry
- 608 - Community Resource Planning and Development
- 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
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

Description

From: provide opportunities for positive youth and family development:

- Transportation is often an issue for rural youth to participate in out of school hours programming.
- Meeting nutritional needs of youth in out of school settings is a problem.
- Migrant families face legal challenges which can prevent access to familiar foods, health care and social needs.

From: provide positive community engagement opportunities for youth and adults:

- Transportation is often an issue for rural youth to participate in out of school hours programming.
- Apathy is learned from community environment.

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

Post program evaluation, record books, surveys and observation, enrollment data for migrant youth are evaluation strategies for outcome indicators listed.

V(A). Planned Program (Summary)

Program # 3

1. Name of the Planned Program

Climate Change

2. Brief summary about Planned Program

Climate change has the potential to have drastic impacts on Vermont agriculture, northern forests, land-use choices, net population change, and the overall Vermont rural economy. Research in this program reflects genetic variations in forests compositions, reduction in carbon footprints in food systems, leaching of nutrients from composts, to developing best management practices to adopt climate change mitigation. VT-AES scientists focus on understanding and modeling these changes, mitigating negative impacts if possible, and positioning our agricultural-based rural economy to remain competitive in the global marketplace. UVM Extension's educational outreach is continually updating its curriculum with the latest research, for changing audiences, and adjusting delivery strategies to meet client needs.

Extension's work with maple producers is sharing the latest research to efficiently produce a quality, safe product while protecting forest stands with good management and sound business practices. We are working with communities to develop policy and engage citizens so they can mitigate the effects of shifting weather patterns. Communities are dealing with invasive pests, water events, forest fragmentation and management, and energy efficiency and usage. Extension is adapting its programming for crop and produce growers who are dealing with extended drought spells and large weather events. Outreach and education assist with irrigation and drainage issues as well as strategies to protect crops and produce from harvest to its end point. Plant variety selection, water management and protection as well as carbon dioxide (CO₂) emissions are other issues on which programming will focus. Extension programming is multidisciplinary resulting in its outreach and education that addresses issues related to climate change also addresses issues identified in Global Food and Community Development planned programs.

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
102	Soil, Plant, Water, Nutrient Relationships	0%		22%	
104	Protect Soil from Harmful Effects of Natural Elements	0%		6%	
112	Watershed Protection and Management	0%		3%	
123	Management and Sustainability of Forest Resources	10%		28%	
125	Agroforestry	0%		4%	
131	Alternative Uses of Land	0%		6%	
132	Weather and Climate	13%		10%	
133	Pollution Prevention and Mitigation	49%		9%	
141	Air Resource Protection and Management	0%		1%	
205	Plant Management Systems	0%		5%	
212	Diseases and Nematodes Affecting Plants	0%		1%	
601	Economics of Agricultural Production and Farm Management	12%		2%	
602	Business Management, Finance, and Taxation	16%		0%	
610	Domestic Policy Analysis	0%		1%	
801	Individual and Family Resource Management	0%		1%	
903	Communication, Education, and Information Delivery	0%		1%	
	Total	100%		100%	

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

VT-AES researchers and UVM Extension have engaged with the maple industry, the agricultural production industries, and the horticultural industry regarding the impact of predicted climate changes on current production. There is considerable concern regarding the advance of invasive insect pests as seasonal warming increases, season length increases, and severity of winters lessens. VT-AES researchers are also engaged in the genetic analyses of invasive plant species, and are working to mitigate this threat to the environment. We have initiated research regarding the generation of greenhouse gas emissions from farm animals and through soil processes.

The agriculture sector must protect land and crops while staying viable. Water management through irrigation, drainage; soil management through new cropping techniques; produce protection and

management strategies are priorities. Forest landowners can be unaware of issues created from fragmentation and forest management decisions which may threaten the forest stand and ecosystem there. Communities look to citizens to aid in addressing threats such as invasive pests and plants, energy issues and water management. Extension is working with them to develop the capacity to deal with these and other issues.

2. Scope of the Program

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

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

1. Assumptions made for the Program

1. Alterations in weather patterns that we have experienced over recent years are indicative of change. Seasons will be milder, spring, summer and winter will be wetter; there will be less snowfall and ground cover in winter.
2. The advance northward of invasive insects, along the east coast, will continue. There are several introductions that threaten the northern forest, particularly the maple industry.
3. The striking changes in the composition of the northern forest over the past 30 years is an indicator in the changes to agriculture, forests and land utilization that will occur in the northeast.
4. Research in these areas by UVM scientists will aid in understanding and predicting the nature of these changes, and will assist our communities in effective planning and mitigation.

2. Ultimate goal(s) of this Program

Improve agricultural and environmental sustainability (Condition)

- Individuals and business owners take actions that improve their economic sustainability while minimizing their impact on the environment
- Individuals and business owners take actions that comply with environmental quality laws and/or protect natural resources

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
2017	2.4	0.0	4.0	0.0
2018	2.4	0.0	4.0	0.0

2019	2.4	0.0	4.0	0.0
2020	2.4	0.0	4.0	0.0
2021	2.4	0.0	4.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

Invasive Pests - monitoring of the Asian Long Horned Beetle and Hemlock Woolly Adelgid; interception and prevention if possible, mitigation through work with bioactive fungi and natural enemy species; work with the US forest service, US Agricultural Research Service (ARS), and the maple industry.

Maple Production - research and extension efforts at the Proctor Maple Center are directed at extending the sugaring season, maximizing yield, and minimizing disease to trees.

Monitoring of the Eastern Forests - Species change and demarcation levels are being observed, documented and modeled for northern forests through remote sensing and on-the-ground observations.

Invasive Plants - research will continue on the genetic and physiological basis for "invasiveness" of problem plant species and introductions.

Climate Change Adaptation - work with growers with irrigation, drainage, plant selection and harvest. "Climate Change Best Management Practices" (CCBMPs) provides education through workshops and focus groups to help farmers boost adoption of climate change mitigation and adaptation strategies.

Forest Health and Sustainability - work with mostly small forest landholders to make decisions that protect forest stands and the ecosystems within, mitigate fragmentation of forest lands and assist with forest land transfer.

Sustainable Transportation - work within the transportation sector to assist them in reducing CO2 emissions while saving fuel and reducing wear and tear on equipment through vehicle certification and certification for staff through education programs.

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"> ● Workshop ● Group Discussion ● One-on-One Intervention ● Demonstrations ● Other 1 (competitive research) ● Other 2 (professional conferences) 	<ul style="list-style-type: none"> ● Newsletters ● TV Media Programs ● Web sites other than eXtension

3. Description of targeted audience

- Agriculture: Farmers
- Agriculture: Produce Growers
- Agriculture: Service Providers
- Agriculture: Government Agency Personnel
- Extension: Faculty/Staff
- Researchers
- Agriculture: Maple producers
- Public: Immigrant population
- Public: Forest land owners
- Public: Business/Commercial
- Public: Professional Drivers

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

- Research Projects
 - Consultations
 - Workshop Series
 - Mass Media: blog post/social media/web page/internet site updating
 - Publication - popular press
 - Focus Groups
 - Research Conferences
- 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 climate change management practices identified for Vermont farms that aid in climate change adaptation
2	Number of ecological and evolutionary factors identified that influence invasive plants in Vermont
3	Number of landowners who actively engage with their land to protect/improve/create woodlands
4	Number enterprises who implement recommended environmental behaviors to meet or exceed terms to have vehicles certified through the eRating program
5	Number of new and continuing enterprise/organizations offering CST 'eco-driver' and/or 'idle free' themed certification courses to employees and related stakeholders in order to promote saving fuel, money, and reducing environmental impacts.
6	Number of individuals who implement one or more best practices that mitigate the effects of climate change for farm, forest, or garden
7	Number of drivers completing a personal pledge to embrace 'Eco-driving' practices
8	Number of eRating certified vehicles

Outcome # 1

1. Outcome Target

Number of climate change management practices identified for Vermont farms that aid in climate change adaptation

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 104 - Protect Soil from Harmful Effects of Natural Elements
- 112 - Watershed Protection and Management
- 125 - Agroforestry
- 132 - Weather and Climate
- 205 - Plant Management Systems
- 601 - Economics of Agricultural Production and Farm Management
- 610 - Domestic Policy Analysis
- 801 - Individual and Family Resource Management
- 903 - Communication, Education, and Information Delivery

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 2

1. Outcome Target

Number of ecological and evolutionary factors identified that influence invasive plants in Vermont

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 102 - Soil, Plant, Water, Nutrient Relationships

4. Associated Institute Type(s)

- 1862 Research

Outcome # 3

1. Outcome Target

Number of landowners who actively engage with their land to protect/improve/create woodlands

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 123 - Management and Sustainability of Forest Resources
- 132 - Weather and Climate

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 4

1. Outcome Target

Number enterprises who implement recommended environmental behaviors to meet or exceed terms to have vehicles certified through the eRating program

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 132 - Weather and Climate
- 133 - Pollution Prevention and Mitigation

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 5

1. Outcome Target

Number of new and continuing enterprise/organizations offering CST 'eco-driver' and/or 'idle free' themed certification courses to employees and related stakeholders in order to promote saving fuel, money, and reducing environmental impacts.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 132 - Weather and Climate
- 133 - Pollution Prevention and Mitigation

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 6

1. Outcome Target

Number of individuals who implement one or more best practices that mitigate the effects of climate change for farm, forest, or garden

2. Outcome Type : Change in Action Outcome Measure

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
- 132 - Weather and Climate
- 205 - Plant Management Systems

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 7

1. Outcome Target

Number of drivers completing a personal pledge to embrace 'Eco-driving' practices

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 133 - Pollution Prevention and Mitigation
- 602 - Business Management, Finance, and Taxation

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 8

1. Outcome Target

Number of eRating certified vehicles

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 133 - Pollution Prevention and Mitigation
- 602 - Business Management, Finance, and Taxation

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

Description

{NO DATA ENTERED}

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

Evaluation during programming will collect input to be used to influence future programming delivery modes, location, timing and topics. Post event evaluations will be used to document best practices, actions that are taken as a result of increased knowledge/skills gained from UVM Extension outreach and education.

V(A). Planned Program (Summary)

Program # 4

1. Name of the Planned Program

Sustainable Energy

2. Brief summary about Planned Program

Energy independence is the hallmark of the work of VT-AES looking for innovative approaches to energy research and education. The research done at the University of Vermont is committed to clean, sustainable energy sources.

Many Vermont dairy farms are operating methane digester systems. Research studies are being done to assess the financial and economic feasibility of converting cow manure into renewable energy products under alternative market and policy scenarios. VT-AES is also studying how plant cell walls present a renewable source of biofuels and other plant based energy products.

Extension will not be reporting in this priority area as programs are no longer significant enough in size to include here. Efforts that could legitimately be allocated here will instead be captured within other planned programs.

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
123	Management and Sustainability of Forest Resources	0%		2%	
201	Plant Genome, Genetics, and Genetic Mechanisms	0%		25%	
202	Plant Genetic Resources	0%		13%	
205	Plant Management Systems	0%		6%	
206	Basic Plant Biology	0%		8%	
216	Integrated Pest Management Systems	0%		8%	
601	Economics of Agricultural Production and Farm Management	0%		22%	
605	Natural Resource and Environmental Economics	0%		16%	
	Total	0%		100%	

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

1. Situation and priorities

Both the economy and the environment consistently top the list of Vermonters' concerns, according to the annual Vermonter Poll (2008). These findings correspond with a recent survey undertaken as part of the Council on the Future of Vermont, a project of the Vermont Council on Rural Development with the goal of promoting public dialogue on values, challenges, opportunities, priorities and visions for Vermont. Survey findings include rankings of the top seven highest rated values and challenges (Center for Rural Studies, August 2008, http://www.uvm.edu/crs/reports/2008/CFV_Full_Report.pdf). Respondents placed the greatest value overall on "the state's working landscape and heritage." The greatest challenges were "the increasing costs of living, such as transportation, heating and electricity" followed closely by "the health and viability of Vermont farms and the agricultural sector."

Clearly, economic opportunities that support the working landscape are needed throughout the state. The Vermont Sustainable Agriculture Council's 2009 Annual Report and Recommendations (<https://www.uvm.edu/sustainableagriculture/council/SAC2009Report.pdf>) focus on two primary areas: strengthening Vermont's local food system and enhancing on-farm energy alternatives. Improved knowledge and skills leading to adoption of new practices can promote economic sustainability of farms, forests, natural-resource based enterprises, and communities. Specific problems that need to be addressed include the "price and supply of fuel poses economic risks to farmers and rural communities."

2. Scope of the Program

- In-State Research
- Integrated Research and Extension

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

1. Assumptions made for the Program

Price of fuel will remain unstable in the future. Rising fuel costs will continue to pose an economic risk to farmers. Economic advantages of on-farm biodiesel production will increase.

2. Ultimate goal(s) of this Program

Improve agricultural and environmental sustainability (Condition)

- Individuals and business owners take actions that improve their economic sustainability while minimizing their impact on the environment (Action)

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
2017	0.0	0.0	0.6	0.0
2018	0.0	0.0	0.6	0.0

2019	0.0	0.0	0.6	0.0
2020	0.0	0.0	0.6	0.0
2021	0.0	0.0	0.6	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

Energy Crop Research Projects

Renewable energy workshops

Economic feasibility and market potentials for oilseed and farm-scale biodiesel production

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 (N/A) 	<ul style="list-style-type: none"> • Other 1 (Research)

3. Description of targeted audience

- Adults
- Agriculture: Crop Producers
- Agriculture: Farmers
- Research scientists

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

- Workshop - single session
- Research Projects

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 research studies that assess the financial and economic feasibility of converting cow manure into renewable energy products
2	Number of research findings that propose using plant cell walls as a source of biofuels

Outcome # 1

1. Outcome Target

Number of research studies that assess the financial and economic feasibility of converting cow manure into renewable energy products

2. Outcome Type : Change in Knowledge Outcome Measure

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 Research

Outcome # 2

1. Outcome Target

Number of research findings that propose using plant cell walls as a source of biofuels

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

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

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
- Government Regulations

Description

Cost of the equipment. Pests on agricultural yields.

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

Collecting data and conducting financial analysis of farm operations.

V(A). Planned Program (Summary)

Program # 5

1. Name of the Planned Program

Childhood Obesity

2. Brief summary about Planned Program

As a part of the overall efforts of UVM Extension and VT-AES to meet growing food demand and addressing food security, there are special efforts to address senior, youth and adult populations having the health and nutritional information they need to combat childhood obesity through making positive choices and having access to local foods. The programs deal with subjects such as healthy eating, access to health resources, and nutrition and physical activity of youth through schools and daycare centers.

Much of this work is designed to directly or indirectly enhance access to healthy, affordable food by households or organizations (e.g. schools), many of which are managing on tight food budgets. Methods include assessment of barriers to food security in the household; education on topics related to the dietary guidelines and food management strategies; distribution of coupons to purchase produce, or distribution of the produce itself; and demonstration of food preparation techniques along with taste-testing opportunities. UVM Extension and VT-AES integrate their work. Extension takes the results from VT-AES and incorporates the latest research into its educational outreach efforts which may be captured in a different planned program.

The Expanded Food and Nutrition Education Program (EFNEP) is part of this effort but is not reported due to no federal base dollars supporting the program. Each program aims to ensure that seniors, youth and their parents have the tools and the knowledge to make better food choices and have access to healthy food on a daily basis.

In-depth analysis of program effectiveness and production of manuscripts on research topics are also part of this work.

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
604	Marketing and Distribution Practices	2%		0%	
607	Consumer Economics	2%		8%	
609	Economic Theory and Methods	0%		4%	
703	Nutrition Education and Behavior	17%		46%	
704	Nutrition and Hunger in the Population	5%		4%	
724	Healthy Lifestyle	22%		30%	
803	Sociological and Technological Change Affecting Individuals, Families, and Communities	0%		2%	
805	Community Institutions and Social Services	52%		2%	
903	Communication, Education, and Information Delivery	0%		4%	
	Total	100%		100%	

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

1. Situation and priorities

Overweight and sedentary lifestyles lead to or exacerbate many chronic diseases including cardiovascular disease, hypertension, diabetes, asthma, cancer, liver disease, and osteoporosis. The number of Vermont adults reporting chronic conditions increases with age; in a recent survey, 88 percent of those age 65 and older reported having one or more chronic conditions and 20 percent reported having four or more. One out of four Vermonters is believed to have diabetes or pre-diabetes. Type 2 diabetes is increasing considerably in children and adolescents. Currently 56% of Vermont adults are overweight or obese with an increase in the rate of obesity among Vermont adults of 77% from 1990 to 2002. The prevalence of obesity among youth is high as well with 24% of Vermont students in grades 8 - 12 overweight or at risk of becoming overweight as measured by age and gender specific body mass index. Overweight among young children is increasing at an alarming rate, more than doubling in the last 20 years. Currently 29% of low-income children between two and five years of age in Vermont who are part of the Women Infants and Children (WIC) program are overweight or at risk of becoming overweight. By being overweight, children are at risk for chronic conditions at an earlier age.

Lifestyle changes that include more healthful eating (encourage consumption of whole grains, vegetables, and fruits - especially those locally grown; portion control; and fewer sweetened beverages), practicing good food safety skills, and increasing physical activity while reducing sedentary time can have a positive influence on reducing and managing chronic conditions to increase their chances for a longer life.

Vermont now has over 1200 migrant farmworkers living and working in the state. This population is geographically, culturally, and linguistically isolated. The majority lack transportation and depend on others for basic needs including housing, purchasing of food or transportation to purchase food, and health care

access. As a relatively new immigrant population in Vermont, organizations, particularly health care centers, have yet to establish culturally and linguistically appropriate policies and practices. The farmworkers, many young men, come from a culture in which women traditionally oversee food consumption and guide health care choices and practices. They are now living in a foreign culture on their own, responsible for their own health and wellbeing.

Poverty, hunger, and food insecurity are all factors that contribute to poor health and poor nutrition. Limited resource individuals and families, faced with the loss of jobs, lack of transportation, less affordable housing, and rising fuel and food costs, may be forced to choose the purchase of essentials like heat and electricity over food. Often times it is the quality of food that is sacrificed in an effort to make ends meet, and caretakers often resort to buying calorie rich, nutrient poor foods because they are less expensive. This pattern of eating exacerbates the obesity epidemic, denies children optimal growth, and has an overall negative impact on the physical, emotional, and financial health of our communities.

Hunger and food insecurity are real and growing concerns in Vermont. In 2007, approximately 71,000 Vermonters, 19,000 of which were children, had a gross annual income at or below 100% of the federal poverty level. The same year an additional 109,000 Vermonters had a gross annual income between 100-199% of the federal poverty level. These two subgroups combined represent the approximately 30% of our population who are at risk for hunger and food insecurity, and the detrimental health effects associated these conditions. Preliminary data indicates that 61,267 Vermonters (30,194 households) received an average of \$200 per month in benefits from the Supplemental Nutrition Assistance Program (3SquaresVT) in November 2008, an increase of 13.9% over the previous year. Even with increasing eligibility and participation, it is estimated that only 68% of eligible Vermonters receive these benefits.

2. Scope of the Program

- In-State Extension
- In-State Research

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

1. Assumptions made for the Program

Preventing or managing chronic diseases can lower health care costs. Most chronic diseases can be prevented through better lifestyle choices. Individuals practicing positive lifestyle changes will feel better about themselves, their families, and their communities.

Vermont School Food Service operations vary considerably in size and sophistication. Production methods vary from "conventional" where ingredients are purchased fresh and products are made from scratch to "assembly" where products are purchased already prepared. The physical plants range from full service commercial kitchens to very small kitchens that might lack commercial dishwashers, hand washing sinks, adequate storage areas, or commercial ovens. The educational level of staff ranges from college level to less than grade 8. Turnover is high amongst employees.

2. Ultimate goal(s) of this Program

Improve individual and family health. (Condition)

- Consumers engage in healthful eating practices and/or physical activity.
- Consumers secure access to safe, nutritious food.
- Individuals access resources which provide and protect health and well-being.

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
2017	6.3	0.0	3.0	0.0
2018	6.3	0.0	3.0	0.0
2019	6.3	0.0	3.0	0.0
2020	6.3	0.0	3.0	0.0
2021	6.3	0.0	3.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

Enhancing Healthy Food Access:

- **Senior Farm Share:** Produce is distributed to approximately 900 households of older and disabled adults who live in subsidized housing. Extension role in this collaborative project involves production of educational materials and conducting program evaluation.
- **Measuring Food Security among Vermont Resettled Refugees:** As a follow-up to previously held focus groups, 25 resettled refugees will participate in individual interviews to understand their household food management strategies, which will be used to reconsider food security policy.
- **Northeast Kingdom Produce Coupon Program:** Approximately 400 households will receive coupons to use in independent markets for the purchase of fresh produce. They will also receive brief education. Extension's role is in program design and evaluation.
- **VT Dept. of Health Produce Prescription Project:** UVM Extension will conduct an evaluation of this newly designed program.
- **Farm to School:** UVM will partner with members of the Farm to School network to continue work on identifying and marketing the economic value of participating in Farm to School, and to assess the impact of the coming year's Farm to School grants.

Puentes a la Salud/Bridges to Health: work with latino farm workers and farm employers in collaboration with the UVM medical school and nursing students providing needs related to health care access or home health, provide health and nutrition education, and food access. Delivery methods: farm visits, phone, consultation.

Local Foods/Farm to Plate: unifies business, government and non-profits to scale up local food production and consumption. Network of more than 160 organizations working to achieve goals to re-localize food production and distribution.

Crowdsourcing Approach to Understand Weight Loss Behavior in Men: a strategic model used to draw a responsive, motivated group of individuals, who are able to provide solutions beyond those that traditional forms of research can.

Becoming an Outdoor Family: an annual weekend event that creates opportunities for families to experience being outdoors together while learning about environmental conservation, outdoor safety and wilderness skills. Families engage in healthy behaviors and acquire skills through outdoor recreation activities like kayaking, hiking, and fishing.

"Food Agency:" a measure of an individual's ability to set and achieve food-related goals in life. Studies to determine use patterns for food purchasing, preparation/cleanup, eating/drinking and traveling associated with food consumption.

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"> ● Workshop ● One-on-One Intervention ● Other 1 (Research) 	<ul style="list-style-type: none"> ● TV Media Programs ● eXtension web sites

3. Description of targeted audience

- Age 60 - Senior
- Agriculture: Beginning Farmers
- Agriculture: New American Farmers
- Agriculture: Migrant workers
- Communities: Non-Governmental Organizations
- Community: Health Entities
- Public: Families with Limited Resources
- Public: Health Providers
- Age 6 - 12 School Age
- Agricultural Scientists

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

- Consultation
- Workshop Series
- Workshop - single session
- Presentations
- Radio
- Television
- Demonstration
- Research Project
- Field Site Visits
- Conference

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 who incorporate one or more healthful eating practices and/or physical activity to prevent/manage disease and/or obesity
2	Number of individuals who select and prepare a variety of produce to help prevent/manage disease and/or obesity
3	Number of weight loss programs that help/reduce adult obesity.
4	Number of individuals who take steps to meet daily needs for health, education, social and personal wellbeing

Outcome # 1

1. Outcome Target

Number of individuals who incorporate one or more healthful eating practices and/or physical activity to prevent/manage disease and/or obesity

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 607 - Consumer Economics
- 703 - Nutrition Education and Behavior
- 704 - Nutrition and Hunger in the Population
- 724 - Healthy Lifestyle
- 803 - Sociological and Technological Change Affecting Individuals, Families, and Communities

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 2

1. Outcome Target

Number of individuals who select and prepare a variety of produce to help prevent/manage disease and/or obesity

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 703 - Nutrition Education and Behavior
- 704 - Nutrition and Hunger in the Population
- 803 - Sociological and Technological Change Affecting Individuals, Families, and Communities

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 3

1. Outcome Target

Number of weight loss programs that help/reduce adult obesity.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 724 - Healthy Lifestyle
- 803 - Sociological and Technological Change Affecting Individuals, Families, and Communities

4. Associated Institute Type(s)

- 1862 Research

Outcome # 4

1. Outcome Target

Number of individuals who take steps to meet daily needs for health, education, social and personal wellbeing

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 604 - Marketing and Distribution Practices
- 607 - Consumer Economics
- 704 - Nutrition and Hunger in the Population
- 724 - Healthy Lifestyle
- 805 - Community Institutions and Social Services

4. Associated Institute Type(s)

- 1862 Extension

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

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

Description

{NO DATA ENTERED}

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

Every individual plan of work is logic model based, including targets for outcome indicators. A part of setting targets is laying out an evaluation plan. Evaluation results are reported in the accomplishment report. Post event surveys and evaluations completed by repeat attendees of annual events are asked about changes made as a result of something learned at the previous events, observation, interview, and other evaluation strategies are used to collect changes made and results of those changes experienced by program participants. Regular evaluation occurs at most educational events assessing participant knowledge and skills gained.

V(A). Planned Program (Summary)

Program # 6

1. Name of the Planned Program

Food Safety

2. Brief summary about Planned Program

The incidences of food borne illnesses have continued to increase as our production and availability of food has exploded over the past several decades. There is a keen interest in creating a food system that results in greater food safety through greater application of current knowledge to eliminate microbial contamination and a greater level of education of consumers and other food handling professionals to avoid potential points of contamination.

Consumer interest in artisan and farmstead cheeses is driving explosive growth of on farm cheese operations in Vermont and throughout the United States. With 38 artisan cheese makers, Vermont boasts the highest number of artisan cheese makers per capita in the United States. Research is being conducted to improve food safety on the farm, from milking to marketing this product.

Extension will not be reporting in this priority area as programs are no longer significant enough in size to include here. Efforts that could legitimately be allocated here will instead be captured within other planned programs.

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
311	Animal Diseases	0%		40%	
312	External Parasites and Pests of Animals	0%		5%	
503	Quality Maintenance in Storing and Marketing Food Products	0%		8%	
607	Consumer Economics	0%		6%	
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources	0%		10%	
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	0%		25%	
722	Zoonotic Diseases and Parasites Affecting Humans	0%		6%	
	Total	0%		100%	

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

Small scale food producers and processors often have difficulty understanding and meeting food safety requirements of government regulators and buyers. Further, many small-scale producers and processors may not understand the need to improve their food safety practices so that they can produce the safest product possible for their consumers.

Consumer interest in artisan and farmstead cheeses is driving explosive growth of on-farm cheese operations throughout the United States. As many of these enterprises are small to very small establishments, there is a need for focus on assuring the food safety of cheese produced on farms. During 2010, the U.S. Food and Drug Administration intensified its focus of U.S. cheese makers. In order to allow this industry to grow and prosper, it is essential that the safety of artisan cheese be assured.

2. Scope of the Program

- In-State Research
- Multistate Research

V(D). Planned Program (Assumptions and Goals)**1. Assumptions made for the Program**

Food borne illness can compromise an individual's health. Consumers can lower the risk of foodborne illness by practicing food safety skills and safe food preservation practices. Increasingly, foodborne illness outbreaks are being traced to fresh produce. As harmful microorganisms are part of the gardening environment, home gardens need to follow good agricultural practices to reduce the risk of contamination.

Food producers understand the need for ensuring food safety and are open to working together with relevant stakeholders to improve food safety in Vermont.

Research on microbiological risks will define best risk management practices for artisan cheese makers thus ensuring public confidence in food safety.

2. Ultimate goal(s) of this Program

Improve individual and family health. (Condition)

- Consumers secure access to safe, nutritious food. (Action)

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
2017	0.0	0.0	5.0	0.0
2018	0.0	0.0	5.0	0.0
2019	0.0	0.0	5.0	0.0
2020	0.0	0.0	5.0	0.0
2021	0.0	0.0	5.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

Research - develop methods for detection and evaluate potential for growth and survival of pathogens of concern to Vermont artisan cheese makers.

Food Safety - working with small scale producers on best practices that enable them to provide a safe food product.

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

Extension

Direct Methods	Indirect Methods
• Other 1 (N/A)	• Other 1 (Research)

3. Description of targeted audience

- Small scale meat and produce farmers
- Artisan cheese makers and consumers
- Researchers

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

- Research Projects
- Publications
- Presentations

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

V(I). State Defined Outcome

O. No	Outcome Name
1	Number of research projects working with farmers to improve food safety of artisan cheeses.

Outcome # 1

1. Outcome Target

Number of research projects working with farmers to improve food safety of artisan cheeses.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 311 - Animal Diseases
- 312 - External Parasites and Pests of Animals
- 503 - Quality Maintenance in Storing and Marketing Food Products
- 607 - Consumer Economics
- 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
- 722 - Zoonotic Diseases and Parasites Affecting Humans

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
- Other (Food safety requirements of food)

Description

In 2010, The Food and Drug Administration has taken a closer look at the cheese making process.

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

On farm research studies have been done. Integration of pathogen detection technologies have been used.

