2016 University of Connecticut - Storrs Research and Extension and Connecticut Agricultural Experiment Station - Research Combined Plan of Work

Status: Accepted

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I. Plan Overview

1. Brief Summary about Plan Of Work

The fiscal year 2016 Plan of Work submitted by the state of Connecticut is a joint effort between the Connecticut Agricultural Experiment Station (hereafter designated by CAES) and the University of Connecticut Storrs Agricultural Experiment Station and Cooperative Extension System (hereafter designated by UConn). The plan describes six program areas. Four of these program areas are joint undertakings by CAES and UConn. These include: food safety, food security and food systems, human and animal health, and sustainable environments. UConn will conduct the remaining two program areas: Youth development and 4-H, and Community and economic development. CAES and UConn have developed separate processes for Merit Review, Stakeholder Input, Evaluation of Multi-state and Joint activities, and meeting the needs of underserved audiences across the state. While these efforts are reported separately, often they are coordinated at the specific program level. FY 2016 represents the second year of a five-year planning cycle. To that end, we are "staying the course" on changes that we made last year during the first year of this joint planning cycle. As this process evolves, we will continue to update and improve our joint plan.

In FY 2015, UConn added the Department of Kinesiology and changed the name to the College of Agriculture, Health and Natural Resources (CAHNR). This addition strengthens the College's focus on human health and strengthens public engagement on health related activities.

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

Year	Extension		Research	
	1862	1890	1862	1890
2016	68.0	null	78.0	null
2017	68.0	null	78.0	null
2018	68.0	null	79.0	null
2019	68.0	null	80.0	null
2020	68.0	0.0	80.0	0.0

II. Merit Review Process

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

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

2. Brief Explanation

CAES

An external review process with one non-CAES reviewer will be used. Proposals will be evaluated by the NSF criteria of merit and peer review. Experimental results will be subject to merit and peer-review process by appropriately qualified persons. Research priorities continue to be based on stakeholder input and state needs. The proposed research will be of relevance sufficient for an organizational representative to make an informed decision on the appropriateness for federal and state support. Project proposals will be prepared after consultation with the appropriate Department Head and will be independently reviewed by other qualified CAES or non-CAES scientists. Final approval by the Director occurs prior to submission. The review process adheres to ethical standards on research integrity. All scientific staff have received training on scientific integrity. The merit of the proposed scientific work will be evaluated internally to ensure that the planned research addresses established priorities, meets state and USDA program criteria and goals, is consistent with stakeholders' needs, and has a reasonable likelihood of success with measurable outputs. Scientific peer review of research proposals focuses on the suitability and validity of methods, originality of the topic area, and value of the work to the scientific community and public. CAES scientists are strongly encouraged to publish findings in peer-reviewed journals. Significant effort will be made to convey information to the general public through the writing of non-technical reports, bulletins, fact sheets, pest management guides, and the Station's Record of the Year; all of which will be made available on the CAES website. At the discretion of the Director, project findings may also be disseminated by press release or through social media.

UConn

Extension Program merit review is grounded in the seven-part test of guiding characteristics for an engaged institution as reported in the 1999 Kellogg Commission Report on The Engaged Institution. Key recommendations from external review processes continue as a foundation for program decisions. The 2006 ECOP Criteria of Excellence in Cooperative Extension also serves as a major standard for merit review. The process includes: planning by all faculty and staff by departments and focused issue groups; review of plan at the campus level; periodic reviews by peer institutions, and a review by stakeholders. The Dean of the College also has identified an Advisory Group of stakeholders who provide input and direction for programs.

The Peer Review process for Formula Fund projects is designed to ensure that quality research projects are consistent with identified priorities. Project reviews involve other scientists, and/or administrators within UConn and/or external University scientists. The peer review process provides principal investigators with additional counsel on research direction and implementation. Department Heads approve the proposals for submission. The Director or Associate Director oversees the peer review process, suggests qualified reviewers and ultimately approves projects once they have been peer reviewed.

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?

CAES

There are currently 18 Hatch, 7 Multi-state and 6 McIntire-Stennis projects active at CAES. In addition, there is 1 new McIntire-Stennis and 1 new Hatch project submitted to USDA for review and approval. There are extensive external and internal linkages to other state and federal projects, such as in the participation in the National Plant Diagnostic Network (NPDN) and the US FDA's Food Emergency Response Network (FERN). Stakeholders continue to identify the following issues of concern: (1) development of IPM programs; (2) effective control of insect and plant pathogens; (3) development of specialty crops; (4) more efficient detection of human pathogens transmitted by ticks and mosquitoes; (5) food safety; (6) mitigation of pollution problems; and (7) expanded outreach programs. In some instances, solutions can be found quickly, such as controlling insect and plant pathogens but most identified problem areas are complex and require long-term research efforts. The existing multi-state and integrated programs offer many advantages and enhance efforts to achieve program goals. Scientists with varied educational backgrounds across multiple disciplines will work together in designing experiments, collecting data and evaluating findings. Equipment and resources will be pooled across the multi-state participants, experiments will be conducted in different settings, and key reagents/consumables will be shared. This regional or national approach optimizes the unique expertise of the participants and more efficiently addresses all of the issues of strategic importance among the programs. The extension and outreach component with Cornell, UConn, and other universities will be a key mechanism for transferring information and technological advances to a broad base of stakeholders. The analysis of food and consumer products for unwanted chemicals is an example of how the food safety program will be pursued using both state and federal resources. The Department of Analytical Chemistry receives samples of food and consumer products from other Connecticut state agencies for analysis per state statute and also receives samples as a part of FDA FERN. CAES scientists will also collaborate with the Federal Bureau of Investigation (FBI) Weapons of Mass Destruction Directorate (WMDD), the 14th Civil Support Team of the CT National Guard, and colleagues in other states.

UConn

Our six planned programs will address the critical issues of strategic importance to the state, including those identified by stakeholders and newly formed faculty and field educator teams working together around these six theme areas. For 2016, Extension teams will focus on implementing activities and programs based on team business plans developed in 2014, using a logic model framework. In subsequent years, these business plans will continue to be used to guide activities and programs that address critical issues and needs facing local, regional, state and national citizens and communities.

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

CAES

The research initiatives are broad-based and all stakeholders will benefit by having (1) a cleaner environment with reduced pesticide use; (2) healthy plants and forests; (3) locally

grown produce; (4) a decrease in human and animal disease; (5) safer foods to eat; and (6) by having decreased environmental pollution due to engineered nanomaterials, indoor mold and invasive plants. There are specific research initiatives planned to engage under-served and under-represented groups in the state, including our New Crops Program. Hispanic and Asian populations have requested evaluation of specialty crops such as calabaza, jilo, edamame, vegetable amaranth, beach plums, personal-sized watermelons, and artichokes. Other under-served groups have requested research on crops such as leeks, pak choi, daikon radish, Chinese cabbage, garlic, okra, and sweet potatoes to increase availability in local markets. Direct assistance on forest management practices will be offered to Native American tribes. CAES has a strong outreach program, which transfers results and services to under-served groups. This is being accomplished by distributing written information in Spanish and Chinese and by educating school teachers and students that tour CAES facilities. Minority applicants and women are actively sought for Postdoctoral Research Scientist and durational positions. The latter are located by advertising in newspapers, contacting school officials, and meeting students at local science fairs. Efforts will be made to have a Spanish-speaking scientist assist stakeholders who wish to obtain arborist certification. Two other Spanish-speaking Postdoctoral Research Scientists are available for assistance at the Insect Inquiry Office. Results from two multi-state and integrated programs, as well as a fact sheet on boxwood blight, are printed in Spanish and a fact sheet on bed bugs has been written in Spanish, French, and Chinese. CAES staff members will cooperate with school officials and teachers statewide and will participate in Farm/City Week so as to encourage children to visit experimental plots and learn about scientific research. Other children and teachers attend an annual Station open house in August to meet scientists and learn about research findings. Last, tens of thousands of pounds of produce after harvest will be donated to charities and food banks.

UConn

Our planned programs will address the needs of under-served and under-represented populations, including lower income residents, by incorporating all of our citizens' needs, interests and concerns at the program planning and development levels. In addition, our activities and programs will be located in the communities where vulnerable populations live, work and attend school. Some of our planned programs include nutrition education programs for lower income residents, minority youth and adult parenting and child care educational programs, and risk management education programs for limited resource agricultural producers. The needs of under-served and under-represented populations will be reviewed on a regular basis to insure appropriate inclusion.

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

CAES

CAES scientists will collaborate extensively with domestic and international university colleagues, as well as state and federal agencies, to enhance research expertise and support, disseminate information, or take actions including regulatory response, based on findings and stakeholder needs. Extension occurs indirectly through interactions with the UConn, Univ. of MA, and Cornell Univ. One mandated statutory function is to disseminate IPM research results to Cooperative Extension at UConn. CAES diagnostic services assist UConn and are linked to Cornell Univ. and other institutions through the National Plant Diagnostic Network. Multi-state, integrated programs will: (1) promote economic benefits for stakeholders, (2) convince stakeholders to use IPM, and (3) inform residents about human diseases associated with ticks and mosquitoes and help to mitigate risk. The development and implementation of more efficient farming practices is a high priority within multistate projects. For example, the implementation of pest monitoring systems and effective use of biological controls within nurseries will reduce expenditures on chemicals, decrease pesticide exposure, and reduce contaminant leaching into watersheds. Similarly, new cultural, biological, and other

management options for insect pests will reduce economic and environmental costs from pesticide use. Ongoing research projects will identify more efficient strategies of nutrient use in greenhouses and in the field and will highlight new specialty crops that will increase profits for growers. Outreach efforts will target under-served and under-represented groups and will provide quality food of interest to stakeholders. Our human and animal health planned program will monitor changes in virus infection rates in mosquitoes and other vectors, develop more sensitive and specific molecular-based diagnostic assays, and will identify pesticide-free methods for reducing ticks on private and public properties. Long-term experiments will be conducted to reduce ticks by minimizing deer populations. Novel platforms for bed bug detection in dwellings will continue to be developed. The expected outcomes across all CAES programs will be improved higher yielding crop systems, reduced grower costs, and more healthy human and animal populations.

UConn

Extension Teams' logic model business plans will be used to guide the development of our planned programs impact statements. Teams will submit yearly impact reports highlighting the outputs achieved, outcomes recorded through program evaluations and observations, and the progress made to achieve the desired impacts as defined in their business plans. Research faculty will document the progress of their formula-funded projects through REEport progress reports and results will be collated by planned program. These reports will also be used to review expected outcomes and impacts with actual results of our programs and research projects, and provide guidance to achieve the desired impacts by planned program over the next 5 years

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

The planned multi-state and integrated programs have interdependency and will improve program effectiveness and efficiency. Declining financial and human resources and rising research costs present significant challenges for individual scientists to achieve goals without collaborators and additional federal grant funding. Multi-state funds can leverage other grant funds to enhance resources. Collaborating scientists, who also have extension appointments at Cornell, the University of Massachusetts, or UConn, offer additional expertise and improve program success by disseminating findings to a broader base of stakeholders. As examples of how multi-state projects improve program effectiveness, we highlight the following CAES projects: 1) NE1020, which focuses on a multi-state evaluation of grape cultivars and clones; 2) W2082, which is evaluating the availability of organic contaminants in agricultural ecosystems; 3) NE1040, which focuses on plant-parasitic nematode management as a component of sustainable soil health in horticultural and field crop production systems, 4) NE1443, which focuses on the management of emerging vector-borne zoonotic diseases in the US, 5) NC1173, which addresses honeybee health, and 6) NE1333, which focuses on chestnut trees. Separate competitive funding will be sought by CAES scientists to provide additional support and to improve effectiveness across the four planned programs.

UConn

Our six planned program teams of campus faculty and field educators will develop a strong program evaluation component into their business-planning model. All business plans are required to develop an evaluation strategy. These evaluation plans will be used to improve program effectiveness and efficiency. In addition, we will develop our connections to key stakeholders and critical audiences to assist us with continually improving our programs.

IV. Stakeholder Input

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

- Targeted invitation to traditional stakeholder groups
- Targeted invitation to non-traditional stakeholder groups
- Targeted invitation to traditional stakeholder individuals
- Targeted invitation to non-traditional stakeholder individuals
- Targeted invitation to selected individuals from general public
- Survey of traditional stakeholder groups
- Survey of traditional stakeholder individuals
- Survey specifically with non-traditional groups
- Survey specifically with non-traditional individuals
- Survey of selected individuals from the general public

Brief explanation.

CAES

Public participation is encouraged by inviting stakeholders to attend our annual open house and to tour CAES facilities in order to meet staff, see experimental plots, and gain direct knowledge on research findings. Scientists can target stakeholders and receive input at public meetings, oral presentations to citizens' groups, through the use of traditional and social media to announce CAES findings, by responding to public inquiries, and by serving on stakeholder advisory boards. Following public presentations, question and answer periods are useful in receiving input. More than 20,000 stakeholders benefit directly from CAES programs each year; submitted stakeholder comments are then used to adjust research priorities. Agricultural, public health, and environmental problems generate significant stakeholder interest and enthusiastic public participation is anticipated. Local health departments work with CAES staff to develop pest control platforms. Nursery growers donate plants for studies and are encouraged to closely follow research progress. Efforts will be made to reach under-served and under-represented groups. These actions have stimulated interest among a number of minority groups and have resulted in requests for us to grow specific crops of interest. Tens of thousands of people see CAES exhibits annually at major events, such as the Hartford Flower Show and Eastern States Exposition. Members of the Experiment Station Associates (ESA) will promote CAES scientific activities and will publish a newsletter describing scientific studies and findings. This publication will be made available to members of the ESA, state legislators, and the public.

UConn

The college-wide stakeholder input process will continue to include both research and extension. Extension programs across the state are continually soliciting input from stakeholders to ensure relevance. Information gathered during these informal sessions is shared among program leaders to promote stakeholder-focused programming. In 2014, the University of Connecticut released a bold, new Academic Plan. Concurrently, the College of Agriculture, Health and Natural Resources (CAHNR) created an academic plan that cascades from the campus-wide plan. These plans were shared with stakeholder groups to further connect UConn research and Extension programs with the needs of the state. CAHNR has identified a Dean's Advisory Council to provide input on research and Extension programs developed at UConn. This group, consisting of industry leaders, state and federal agency personnel, and non-profit organizations, meets twice per year to review and provide input on research and Extension priorities. Minutes from these meetings are available through the UConn CAHNR web site.

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
- Open Listening Sessions
- Use Surveys

Brief explanation.

CAES

CAES will use several methods to identify and collect input from individuals and stakeholder groups. Stakeholders are individuals that may use agricultural or public health research and benefit from this and other activities, including outreach, in the state or nation. CAES staff members are available to give presentations to agricultural, environmental and forestry organizations; civic groups; and students at all levels of education. In addition, stakeholders are identified so as to include growers and other groups that visit CAES displays at agricultural fairs and other events, attend public meetings and listening sessions at CAES, and who request information and assistance by phone, written communication, social media, or by visiting Station laboratories and field plots. The Science Citation Index and Google Scholar identify scientists in other institutions that use CAES published findings. Surveys/evaluations at public meetings, workshops, and similar events will be also be used to identify stakeholders and to receive input. CAES is committed to facilitating equality of service and ease of access to all research, service, and outreach activities. Although CAES uses multiple means to reach and identify stakeholders, we have found that direct contact is the most effective.

UConn

Individuals who participate in our programs and those with connections in industry groups that we serve; including those from underrepresented and underserved audiences will be used to assist us in identifying stakeholders. We will collect input from our individual and group stakeholders by conducting the following activities. A State Extension Partners Council comprised of representatives of County Extension Councils and other affiliated organizations such as 4-H camp boards, IFYE, and the master gardener association will meet at least twice a year. The Dean's monthly update newsletter will be sent to all faculty and staff via e-mail/web, which reports on his conversations with stakeholders and clientele. We will use on-line tools to solicit input from potential and current clientele and stakeholders. The Dean and College leadership meet regularly with representatives of 30 organizations, agencies and other interests, who comprise a College Advisory Board.

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 selected individuals from the general public

Brief explanation.

CAES

Research objectives are frequently established as a direct result of stakeholder interaction. CAES uses a range of methods to identify stakeholders and receives their input on programs and research. Stakeholders consist of scientists, elected officials, business owners, administrators, forestry and environmental regulators, landscapers, industry personnel, state and federal workers, students, and consumers of agricultural products. Some of these persons have opportunities to be directly involved in research activities. For example, growers that implement IPM programs or other cost-effective farming practices are primary beneficiaries and provide direct input to CAES staff. Open house events and meetings on special issues will be held to allow stakeholders to provide written or verbal comments. Open listening sessions will be held to meet with more specialized groups. Survey or evaluation forms will be used at public meetings, open houses, and at workshops to receive input. These methods are effective tools for gathering information and will be an adjunct procedure used along with summarized verbal suggestions. When scientists attend growers' meetings, they will invite stakeholders to participate in research programs and to provide input on experimental design as appropriate. Six multi-state research projects are designed to investigate a variety of agricultural problems and frequently involve direct stakeholder interaction. Station scientists will also collect stakeholder input by serving as members or officers of board of directors for more than 150 civic and professional organizations. This level of activity will provide additional opportunities for stakeholders to learn about CAES research and to comment on the programs and findings.

UConn

Stakeholders such as vegetable producers and town officials will continue to provide input through end-of-session program evaluations with suggestions for improvements, as well as current and future needs. The CAHNR Journal, a periodic newspaper/web page, highlights research and extension efforts and is available to the public, with comments solicited. The Sea Grant program will collect input from aquaculture producers and town officials. Meetings with state boards such as the Food Policy Council and Farm Services Agency staff will provide additional stakeholder input. The Agricultural Risk Management Advisory Group, comprised of more than 40 agricultural related stakeholders from both traditional and non-traditional perspectives, will provide input on a regular basis. Increased use of the internet, both e-mail and the web, will provide input from a wide range of current and potential clientele.

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.

CAES

Stakeholder input will help identify immediate problems and align research priorities. For example, experimental design is sometimes revised after receiving feedback from growers on field studies. Summarized below are some examples that describe how stakeholder input was considered in making programmatic decisions. CT residents reported on salt marsh dieback and research was initiated to determine the root cause. Bed bugs have become widespread in many areas and at the request of the public and of pest control operators; research on novel monitoring and control approaches has started. The discovery of an exotic insect pest, the small Japanese cedar longhorned beetle, was a direct result of stakeholder input. Similarly, grape growers have asked that studies be initiated on the spotted wing drosophila. Beekeepers requested a state action plan for Africanized honey bees and wanted studies conducted on the cause(s) of colony collapse disorder. The plan was developed and stakeholders were trained on how to depopulate a honey bee colony or swarm. Stakeholder attendance and participation in open house events and public meetings is essential to obtain valuable feedback. Judgment on accountability of how well funds are used for research ultimately rests with the stakeholders. Therefore, opinions and perceptions held by these groups will be considered by scientists and administrators in all programs. Once input is received, summaries of the comments will be transferred to the Department Heads and the CAES Director for consideration. The Director will then discuss these comments at monthly administrative meetings.

UConn

Stakeholder input will be considered when we redesign programs, initiate new programs, as a basis for grant proposals, and as a means for obtaining different perspectives when the College considers restructuring programs.

V. Planned Program Table of Content

V(A). Planned Program (Summary)

Program # 1

1. Name of the Planned Program

Food Safety

2. Brief summary about Planned Program

The Food Safety program is designed to ensure a safe food supply for the citizenry of Connecticut. Research and extension programs will address pre-harvest/slaughter and post-harvest/slaughter food safety at farm, processor, food service and consumer levels. These efforts will include chemical residue analysis of foods, methods for inactivating foodborne pathogenic microbes, probiotic controls of Salmonella, use of risk analysis for improving food safety, mastitis resistance to enhance safety of dairy products, attenuation of antibiotic resistance in foodborne pathogens, Good Agricultural Practices (GAP) training for crop producers, Hazard Analysis Critical Control Points (HACCP) training for meat and seafood producers and handlers, and safe practices for food processing and storage for homeowners.

Specifically, the Connecticut Agricultural Experiment Station (CAES) analyzes foods and consumer products for adulteration with chemicals and heavy metals, as well as for label compliance. Samples may be submitted not only from other state agencies but also from federal partners, including the Food and Drug Administration (FDA), 14th Civil Support Team of the CT National Guard, and the Federal Bureau of Investigation Weapons of Mass Destruction Directorate. The Station receives funding as part of a cooperative agreement with the US FDA Food Emergency Response Network (FERN). The FERN responds to chemical terrorist activities or other national emergencies related to the food supply. With additional funding from the FDA, a state risk-based surveillance program with the Connecticut Department of Consumer Protection that analyzes a broad range of fresh and manufactured foods for pesticide contamination is being brought under ISO accreditation. Both domestic and imported foods will be included in this market basket program. Additional research will address the fate and effects of nanoparticles in food crops, including the development of novel techniques for detection. Additionally, honey bees, flowers, nectar, and pollen will be tested for neonicotinoids and other pesticides. Chemists will continue validating new procedures, such as the use of gas chromatography with triple quadrapole mass spectrometry to detect synthetic pyrethroids in sediments and biota such as lobsters. New liquid chromatography with high resolution tandem mass spectrometry methods will be used to detect plant toxins and other organic contaminants in food and water.

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
205	Plant Management Systems	10%		5%	
206	Basic Plant Biology	0%		5%	
212	Diseases and Nematodes Affecting Plants	0%		5%	
215	Biological Control of Pests Affecting Plants	25%		5%	
216	Integrated Pest Management Systems	35%		18%	
315	Animal Welfare/Well-Being and Protection	5%		5%	
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources	15%		53%	
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	10%		4%	
	Total	100%		100%	

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

1. Situation and priorities

Food safety has been identified by stakeholders as a high priority area for research. In view of recurring instances of contaminated foods, citizens remain concerned about unwanted and potentially dangerous chemical, microbiological and physical adulterants in food, beverages, and consumer products. Research and Extension teams will work independently and through integrated approaches to identify problems/challenges most relevant to the state and region and will work with stakeholders to fully describe and address the current situation. There are perceptions that the consumption of food containing pesticides or heavy metals can cause illness and that poisons can be deliberately introduced into the food system to cause harm. Consequently, active food surveillance for adulteration and robust research programs for developing more sensitive analytical platforms for chemical/metal detection will be pursued at CAES. Faculty researchers at the Storrs Agriculture Experiment Station are primarily focused on studies concerned with microbiological food safety hazards. The FDA FERN is a laboratory network designed for mutual assistance in the event of national emergencies and allows individual states to participate with federal partners in training exercises focused on incident response and recovery, as well as on technological advances. Rapid response and recovery are critical to preventing illnesses. Staff is well trained; there are extensive collaborations with personnel in federal and state laboratories, law enforcement and universities. State-of-the-art equipment provided by the FDA is available for this program, with instruments measuring analytes at the level of parts per trillion.

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

Statewide, we assume that regulatory, economic, environmental, and social conditions will remain consistent with previous years. Teams will evaluate basic assumptions annually to ensure that conditions are within acceptable limits. In addition, as a small state we are constrained by being "one-deep" in many program areas. Retirements and transfers of our scientists/faculty can create program discontinuities while we attempt to refill those vacancies. At CAES, there are several assumptions that enable anticipation of how the program will proceed. Currently, there is a relatively stable workforce, with 1 year remaining on a 5-year, $2,000,000 grant from US FDA FERN, and 2 years remaining on a related but separate 5-year $1,400,000 grant from FDA for Accreditation acquisition. Key staff has therefore remained employed. Discussions are now underway with the FDA to extend participation in the FERN for an additional 5-year period, pending available federal funds. The second FDA grant focused on ISO accreditation ends in 2017. Also, FDA officials have purchased analytical equipment to support the program, have standardized testing procedures among states, and conduct proficiency tests to ensure competence. There are currently sufficient state and federal funds available to perform all of the planned work. Active collaborations with state, federal, and university scientists have strengthened the program. Experienced staff has access to a substantial knowledge base and to the use of precision instruments. It is expected that analyses of foods and beverages will result in the prompt identification of unwanted chemicals and in the recall of tainted or adulterated products from the market. Test results will provide stakeholders with confidence in the integrity of the food production and distribution system.

2. Ultimate goal(s) of this Program

The primary goal of this program is to improve and ensure food safety in Connecticut and across the region. Specific initiatives within the program include the use of active surveillance and analysis to detect adulteration, the development and validation of more sensitive and specific analytical platforms, the investigation of biological and GRAS chemical interventions for inactivating pathogenic microbes, and educating people involved with all steps of the food process (i.e., farm-to-fork) on novel and improved approaches for ensuring a safe food supply.

V(E). Planned Program (Inputs)

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

Year	Extension		Research	
	1862	1890	1862	1890
2016	4.0	0.0	3.4	0.0

2017	4.0	0.0	3.4	0.0
2018	4.0	0.0	3.4	0.0
2019	4.0	0.0	3.4	0.0
2020	4.0	0.0	3.4	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

We are planning to conduct the following programs/activities in the Food Safety planned program.

- Development of more efficient and accurate analytical platforms for detecting chemicals and metals in foods and beverages
- Conduct research experiments with foodborne pathogenic microorganisms and in particular focus on development of tools for minimizing their presence
- Use risk analysis for assessing and communicating food safety risks
- Provide results of survey and research findings to the public through press releases, open house events, displays at agricultural fairs, and social media
- Dissemination of findings to state and federal agencies with regulatory responsibilities (i.e., CT Department of Consumer Protection, CT Department of Environmental Protection, CT Department of Agriculture, CT Department of Public Health, and US FDA)
- Conduct workshops and webinars for food professionals and the public
- Develop YouTube videos, and mobile apps.
- Provide training relevant stakeholder audiences
- Provide individual counseling and assessments
- Produce on-line resource materials such as fact sheets, impact statements and news articles

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

Extension

Direct Methods	Indirect Methods
● Education Class ● Workshop ● Group Discussion ● One-on-One Intervention ● Demonstrations ● Other 1 (Presentation to civic groups) ● Other 2 (Poster presentation of research)	● Newsletters ● TV Media Programs ● Web sites other than eXtension

3. Description of targeted audience

Target audiences include all individuals concerned about the safety and integrity of the food supply. This includes not only producers, processors, distributors, retailers, and consumers but also state and federal public health officials and regulators, law enforcement, educators, and extension specialists. Women, members of minority organizations, and children are examples of under-represented and under-served groups impacted by this program.

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

- Expert services, consultations
- Formal Extension outreach programs
- Face to face general group education sessions/workshops
- Fact sheets, bulletins and newsletters written or edited
- Training of undergraduate, graduate and post doctoral students

☑ 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 stakeholders gaining knowledge about food safety
2	Number of state and federal regulatory agencies making decisions on test results
3	Improve food safety through adoption of safe food practices by producers, processors and/or consumers
4	Approaches/techniques developed for inactivating foodborne pathogens

Outcome # 1

1. Outcome Target

Number of stakeholders gaining knowledge about food safety

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 711 - Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources

4. Associated Institute Type(s)

- 1862 Research

Outcome # 2

1. Outcome Target

Number of state and federal regulatory agencies making decisions on test results

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 711 - Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources

4. Associated Institute Type(s)

- 1862 Research

Outcome # 3

1. Outcome Target

Improve food safety through adoption of safe food practices by producers, processors and/or consumers

2. Outcome Type : Change in Condition Outcome Measure

3. Associated Knowledge Area(s)

- 205 - Plant Management Systems
- 212 - Diseases and Nematodes Affecting Plants
- 315 - Animal Welfare/Well-Being and Protection
- 711 - Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and

Other Sources

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

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 4

1. Outcome Target

Approaches/techniques developed for inactivating foodborne pathogens

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 212 - Diseases and Nematodes Affecting Plants
- 711 - Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources
- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

4. Associated Institute Type(s)

- 1862 Research

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

- Economy
- Appropriations changes
- Competing Programmatic Challenges
- Other (Unanticipated loss of staff)

Description

The primary external factors that can significantly affect outcomes are financial resources and competing programmatic challenges. If extensive budget cuts continue at either the state or federal level, there could be negative impacts on program activities. The state's economy is currently sluggish and projected budget deficits warrant concern. At the federal level, Hatch funds are being used to support scientist and graduate student salaries and to purchase supplies for analyses and research but have been essentially flat for many years. In addition, the FDA FERN grant was cut by 6% in FY 2014-2015, the last year of the current funding cycle. Although discussions over the 2015-2020 cooperative agreement extension have begun, program continuity is not certain and the grant term officially ends in

June 30, 2015. Loss of this funding will have significant negative impacts on program performance, potentially involving the loss of several staff members at CAES. The collective loss of research capacity and resources would result in decreased output measures and outcomes.

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

Since the research effort is considered short term based on current needs and is prone to shifts in priorities depending on immediate food safety issues, it is more appropriate to plan evaluations for "during the program" to assess effectiveness. Stakeholders will offer written input on how well they think the research and services are yielding relevant findings and direct benefits. This approach provides assessment of short-term knowledge changes following public meetings or direct one-on-one interactions. In addition, direct feedback on program performance is available from FDA via agency response to submitted progress reports on specific projects. Also, the Science Citation Index and Google Scholar will be used to assess recognition of published articles by the scientific community for the program. National or state recalls of adulterated foods or other products will be an excellent measure of during program actions.

V(A). Planned Program (Summary)

Program # 2

1. Name of the Planned Program

Food Security and Food Systems

2. Brief summary about Planned Program

This program is focused on reducing food insecurity in Connecticut and across the Northeast. Research and extension programs address food production and the broader food system including processing, access, consumption, waste, and distribution. In Connecticut, food production primarily consists of dairy and specialty crops. There is a need to improve Best Management Practices (BMPs) for producers and to incorporate integrated pest management (IPM) strategies and improved business practices. This program also addresses improved access to fresh fruits and vegetables for low-income families, schools in urban areas, and other under-represented groups.

In 2012, UConn completed a food insecurity study in all 169 cities and towns across the state. The study ranks the towns on three different food security metrics: socio-economic factors; proximity to food retailers; and participation in public food assistance programs and availability of transportation. While it is not possible to combine the rankings, the metrics provide a snapshot for comparison of towns within each metric. The study also considers the importance of town size to allow closer comparisons of similar sized towns. Ultimately, solving food security challenges requires a comprehensive approach that considers multiple dimensions of food security and one that demands close coordination among groups actively working to improve food security across the state.

IPM increases farming efficiency and can mitigate the growing demand for food due to population pressures and a changing climate. Increased productivity depends on healthy pollinator species and plant species to sustain these populations. Cultivar screening for resistance to pathogens is a major initiative. Studies evaluating cover crops to control parasitic nematodes demonstrate a multistate IPM effort. Program goals include investigations of plants and their pests; IPM development/implementation; and introduction of new crops that minimize pesticide use. A new scientist will study bacterial pathogens, including molecular approaches to identify infection mechanisms. Another new scientist will investigate the role of stress on infestation. Forest plots will be monitored to detect emerging insect, disease, and invasive plant problems. New crops will be evaluated in response to requests from under-represented groups. CAES is the state plant regulatory agency, responsible for monitoring forest health, detecting exotic pests, and registering/inspecting nurseries and honey bee colonies. The CAES website, publications, presentations, and open house events disseminate findings to stakeholders.

UConn research and Extension programs focused on food production continue to address challenges posed by increased variability in regional climate and the high costs of doing business in the state. Deep zone tillage (DZT) practices have proven highly successful in increasing yields while reducing input costs for agricultural producers. Trainings for new and beginning farmers and ranchers stress sustainable practices and high-level business acumen to meet the economic and environmental regulatory demands of food production in the state.

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%		1%	
202	Plant Genetic Resources	4%		12%	
205	Plant Management Systems	25%		15%	
206	Basic Plant Biology	4%		5%	
211	Insects, Mites, and Other Arthropods Affecting Plants	0%		8%	
216	Integrated Pest Management Systems	10%		21%	
301	Reproductive Performance of Animals	0%		3%	
303	Genetic Improvement of Animals	0%		2%	
304	Animal Genome	0%		2%	
306	Environmental Stress in Animals	4%		2%	
307	Animal Management Systems	4%		5%	
315	Animal Welfare/Well-Being and Protection	4%		5%	
503	Quality Maintenance in Storing and Marketing Food Products	5%		3%	
601	Economics of Agricultural Production and Farm Management	15%		5%	
602	Business Management, Finance, and Taxation	5%		0%	
604	Marketing and Distribution Practices	0%		1%	
605	Natural Resource and Environmental Economics	5%		7%	
607	Consumer Economics	10%		0%	
704	Nutrition and Hunger in the Population	5%		3%	
	Total	100%		100%	

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

1. Situation and priorities

Stakeholder input has identified the following priority issues for research within the program: development and implementation of IPM strategies, development of rapid solutions to emerging pests, cultivation strategies to minimize soil erosion and pesticide use, and introduction of specialty crops. IPM programs are particularly important given public concern over the perceived association of pesticide exposure with disease and environmental contamination. Growers want efficient cost-effective methods of

pest control that lessen liability due to pesticide exposure. Current work indicates that less toxic pesticides can be used to address pest problems and that alternative application strategies may lessen overall amounts needed for control. In addition, research has shown that IPM practices can be successful in decreasing pesticide use, human health risks, and costs to the grower. Also, there is stakeholder interest for locally grown specialty crops, such as calabaza, edamame, leeks, vegetable amaranth, pak choi, daikon radish, watermelon and Chinese cabbage. A major goal is to have locally grown, fresh produce consumed by students in urban and rural school systems. Protecting pollinators from agrichemical exposure is a high priority. Several criteria are considered when determining research priorities. First, the problem must be of state and national relevance. Research findings should yield measurable economic, environmental, or health impacts. There must be adequate financial support, laboratory capacity, and technical staff to conduct the research. There may be existing collaborations with domestic and international scientists to increase the likelihood of success and the impact of the work. A primary focus is to increase US agricultural productivity and to improve global capacity to meet the growing food demand both at home and abroad. Successful IPM programs developed at Cornell University and elsewhere will be used as models. Once emerging insects or plant pathogens are detected, remedies will be developed for immediate control. Recent success at specialty crop introduction has heightened stakeholder enthusiasm.

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

We assume that economic, environmental, and social conditions will remain sufficiently consistent. Each year, teams will evaluate basic assumptions to ensure that conditions are within acceptable limits. In addition, because we are a small state, we also are constrained by being "one deep" in many program areas. Retirements and transfers of our Extension faculty can create program discontinuities while we attempt to refill those vacancies. We assume that funding will continue.

At CAES, there are several assumptions about the research and staff involved. Science-based assumptions are linked to past evaluations of findings and stakeholder input. There is currently sufficient staff and funding to perform field and laboratory studies. Three additional scientists have been hired in the last year and portions of their research programs will directly impact and benefit this program. Extensive multistate and international collaborations to enhance research efforts will continue. IPM practices will result in grower acceptance of new methods, higher quality crops, and reduced pesticide exposure. Effective IPM programs are in place in CT; there is frequent communication between CAES and UConn on IPM and related work. Jointly planned research on the use of bacteriophages to counter bacterial infections of peaches and other stone fruits will continue. Staff has access to a substantial knowledge base and results from other states. Farmers allow experiments to be performed on their properties. Annual crop and forest surveillance for emerging pest problems enables early detection, which leads to the development of efficient control practices to reduce economic losses. Our staff is well trained to diagnose problems and will work with stakeholders to find solutions. Based on past and current experience, there is continued stakeholder interest for new crops. Research on these new crops will increase farm income in

rural areas. Staff conducting these studies have experience in performing field trials and have contacts with several growers. Hatch funds will continue to leverage other financial resources.

2. Ultimate goal(s) of this Program

The primary goal of this planned program is to reduce food insecurity in Connecticut and across the northeast region. Specific goals include identifying and solving emerging pest problems, including the use of molecular-based detection platforms; developing and implementing IPM systems; encouraging growers to use insect and disease resistant cultivars; and to increase agricultural and forestry productivity. It is expected that this program will develop new management options, decrease agrichemical use and farm costs, diversify the local food supply, and increase economic benefits for farmers. Moreover, a database of diagnostic records will be produced on plant pests and a Plant Pest Handbook is available via public electronic access (CAES website). A web-based system for stakeholders to diagnose their pest problems is under development.

V(E). Planned Program (Inputs)

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

Year	Extension		Research	
	1862	1890	1862	1890
2016	5.0	0.0	20.3	0.0
2017	5.0	0.0	20.3	0.0
2018	5.0	0.0	20.3	0.0
2019	5.0	0.0	20.3	0.0
2020	5.0	0.0	20.3	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

We are planning to conduct the following programs/activities in the Food Security and Food Systems planned program:

- Improve trapping methods to monitor pests
- Assess plant cultivar resistance
- Develop biological control agents
- Evaluate the use of mulching and related strategies for weed control
- Develop new crop cultivars with maximum quality and yield to enhance farm income
- Conduct relevant research and dissemination of research findings
- Provide IPM training
- Develop new farm management strategies
- Increase invasive plant control
- Donate surplus crops to food banks
- Conduct ground and aerial forest surveys
- Participate in the National Plant Diagnostic Network
- Staff participation in stakeholder and professional organizations

- CAES open house for public to view programs and comment on findings
- Conduct workshops, trainings and webinars
- Develop YouTube videos and mobile apps
- Provide training to relevant stakeholder audiences
- Individual consultations and assessments
- Produce online resource material such as fact sheets, impact statements and newsletter articles

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

Extension

Direct Methods	Indirect Methods
● Education Class	● Newsletters
● Workshop	● TV Media Programs
● Group Discussion	● Web sites other than eXtension
● One-on-One Intervention	● Other 1 (Radio programs)
● Demonstrations	● Other 2 (Youth via teachers)
● Other 1 (Diagnostic Services)	

3. Description of targeted audience

Target audiences include consumers, farmers/producers, agency and organizations that serve or handle food, food related businesses/processors, farmers' market staff and vendors, seafood industry processors, dealers, harvesters, importers, regulatory personnel, researchers, and policy makers. Additional audiences include high school teachers, the media, food bank personnel, beekeepers, maple syrup producers, seed companies, water company officials, and citizens. Women, minority organizations, and children are under-represented and underserved groups targeted under this program. Efforts will be made to reach these groups through interactions with teachers and students.

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

- Face to face general group education sessions/workshops
- Individual consultations
- Fact sheets, bulletins and newsletters written or edited
- Training of undergraduate, graduate and post doctoral students
- Formal Extension outreach programs

☑ 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 homeowners, growers, students and/or media reporters gaining knowledge on insect pests and plant pathogens
2	Number of growers gaining information on IPM practices
3	Reduce food insecurity in the state of Connecticut and across the Northeast.
4	Increase the percent of locally grown food that is purchased by Connecticut citizens.
5	Increase sustainable, diverse and resilient food systems across scales
6	Improved national and global capacity to meet growing food demand.

Outcome # 1

1. Outcome Target

Number of homeowners, growers, students and/or media reporters gaining knowledge on insect pests and plant pathogens

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 102 - Soil, Plant, Water, Nutrient Relationships
- 202 - Plant Genetic Resources
- 205 - Plant Management Systems
- 206 - Basic Plant Biology
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 216 - Integrated Pest Management Systems

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 2

1. Outcome Target

Number of growers gaining information on IPM practices

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 205 - Plant Management Systems
- 206 - Basic Plant Biology
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 216 - Integrated Pest Management Systems

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 3

1. Outcome Target

Reduce food insecurity in the state of Connecticut and across the Northeast.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 102 - Soil, Plant, Water, Nutrient Relationships
- 503 - Quality Maintenance in Storing and Marketing Food Products
- 601 - Economics of Agricultural Production and Farm Management
- 604 - Marketing and Distribution Practices
- 605 - Natural Resource and Environmental Economics
- 607 - Consumer Economics
- 704 - Nutrition and Hunger in the Population

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 4

1. Outcome Target

Increase the percent of locally grown food that is purchased by Connecticut citizens.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 503 - Quality Maintenance in Storing and Marketing Food Products
- 601 - Economics of Agricultural Production and Farm Management
- 602 - Business Management, Finance, and Taxation
- 604 - Marketing and Distribution Practices
- 607 - Consumer Economics
- 704 - Nutrition and Hunger in the Population

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 5

1. Outcome Target

Increase sustainable, diverse and resilient food systems across scales

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 503 - Quality Maintenance in Storing and Marketing Food Products
- 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
- 607 - Consumer Economics
- 704 - Nutrition and Hunger in the Population

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 6

1. Outcome Target

Improved national and global capacity to meet growing food demand.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 102 - Soil, Plant, Water, Nutrient Relationships
- 303 - Genetic Improvement of Animals
- 307 - Animal Management Systems
- 503 - Quality Maintenance in Storing and Marketing Food Products
- 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
- 607 - Consumer Economics
- 704 - Nutrition and Hunger in the Population

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)
- Other (Staff changes, media influences)

Description

External factors that could affect outcomes include financial stability, staff turnover, and inclement weather. The state's economy continues to struggle and projected deficits warrant concern. Reductions in state funding would negatively impact field studies on basic plant research, which leads to peer-reviewed papers and non-technical publications, and also could compromise the level of technical assistance. Coupled with essentially flat Hatch funds over several years, it is possible that there will be insufficient funds for some aspects of the program. Without continued stable resources, some program goals may be difficult to achieve. Moreover, weather conditions are unpredictable and may become more problematic with a changing climate. Such changes may increase insect/herbivore damage and plant disease, which can adversely affect field work and slow research. Competing public priorities and programmatic challenges can also impact outcomes. Research programs take time to design, and years may be required complete experiments. When new issues arise, such as the brown marmorated stink bug and spotted wing drosophila, research resources must be re-allocated to address stakeholder concerns and to implement emergency control programs. This can divert resources from other existing studies in ways that are difficult to predict.

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

Since the research effort is considered short term based on current needs and is prone to rapid shifts in priorities depending on immediate food security and food systems issues, it is most appropriate to plan evaluations for "during the program" to assess effectiveness. Stakeholders will offer written input on whether research and services are yielding relevant findings and direct benefits. This approach provides assessment of short-term knowledge changes following public meetings or direct one-on-one interactions. In addition, direct feedback on program performance is available via agency response to submitted progress reports. Last, the Science Citation Index and Google Scholar will be used to assess recognition of published articles from program by the scientific community.

V(A). Planned Program (Summary)

Program # 3

1. Name of the Planned Program

Human and Animal Health

2. Brief summary about Planned Program

This Planned Program will address both fundamental and applied aspects of human and animal health, with a primary focus on improving health in Connecticut. Research and Extension programs will address biological (e.g., microbe-based disease) and/or behavioral bases for health-related conditions in individual humans/animals and in their communities. The main objectives are to identify the primary mosquito vectors of encephalitis and related viruses, determine the role of ticks in the transmission of subtypes of the Powassan virus, develop more effective methods of arthropod/vector and mold control, and to disseminate experimental findings to stakeholders.

Research and Extension teams will continue to work independently and through integrated approaches to identify relevant problems in the state/region and will work with stakeholders to investigate the most important areas of study. Studies concerned with human health will focus on the role of bioactive food components on inflammation and oxidative stress, the role of n3 fatty acids in health and disease, individual and community approaches for minimizing the occurrence and impacts of obesity and diabetes, and contribution of dairy product proteins for maintaining muscle mass with aging. Animal health studies at the Storrs Agricultural Experiment Station will be concerned with mediating respiratory diseases in poultry and swine, characterizing Mycoplasma gallisepticum as an agent of disease, development of recombinant live vaccines, and development of a necrotic enteritis disease model in turkeys.

At CAES efforts include hiring a new scientist to investigate the physiological interactions that control infection and transmission between the mosquito host and arboviruses; new research on chemical control of bed bugs and the development of more effective monitoring/trapping systems; research on indoor mold problems requested by school officials and other groups. In addition, Station scientists receive state and federal funding to support research on: sampling arthropod populations, developing tests with highly specific recombinant fusion proteins for pathogen detection; testing engorged mosquitoes to identify the blood source through molecular analysis; and on developing novel chemical and biological strategies for pest control. Staff have active collaborations with researchers at universities, state/local health departments, and the Centers for Disease Control and Prevention (CDC). Efforts to monitor and control mosquitoes that transmit diseases, done in collaboration with municipal public health officials, will include trap sites on private properties to encourage stakeholder interaction. Field tests on tick control will also be conducted on homeowners' properties. Laboratories are well-equipped to isolate and identify pathogens. Concern has continued to increase over the chickungunya virus, which has been identified in the Western Hemisphere; a new CAES scientist will investigate host-virus interactions at the physiological and molecular level to elucidate mechanisms of infection and transmission of this and related viruses.

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
307	Animal Management Systems	5%		1%	
311	Animal Diseases	10%		13%	
315	Animal Welfare/Well-Being and Protection	5%		2%	
604	Marketing and Distribution Practices	10%		3%	
607	Consumer Economics	10%		3%	
610	Domestic Policy Analysis	10%		3%	
701	Nutrient Composition of Food	0%		8%	
702	Requirements and Function of Nutrients and Other Food Components	0%		13%	
703	Nutrition Education and Behavior	30%		0%	
722	Zoonotic Diseases and Parasites Affecting Humans	0%		43%	
723	Hazards to Human Health and Safety	0%		8%	
724	Healthy Lifestyle	20%		3%	
	Total	100%		100%	

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

1. Situation and priorities

The individual (both animals and human) and community health areas are important components of our respective plans of work. For individual human and animal health, our interests are related to nutritional and infectious disease bases for health problems. In addition, we work to alter individual behaviors to facilitate improved health. Programs will include efforts focused on reducing the incidence and/or severity of chronic diseases including obesity, Type II diabetes and coronary heart disease. Specific approaches for the latter will include investigations of the roles of general and specific (e.g., berry anthocyanins) bioactive components present in foods, lipid metabolism and the dietary influences that affect the latter, chronic inflammation, and utilization of nanotechnology-based techniques as nutrient delivery systems. Also, studies are anticipated that will seek novel approaches for maintaining muscle mass with aging. Community health approaches will involve studies directed at evaluation of nutrition education efforts to prevent childhood obesity from preconception to preschool in low-income families, and development of a food liking survey for assessing dietary risk of obesity and cardiovascular disease (CVD).

Public health problems include Lyme disease, tularemia, human granulocytic anaplasmosis, monocytic ehrlichiosis, human babesiosis, West Nile encephalitis, Jamestown Canyon, LaCrosse and Eastern Equine Encephalitis viruses. In the US, tens of thousands of people are infected with the agents that cause Lyme disease and West Nile encephalitis virus annually. Stakeholders have expressed great concern about how arthropods cause acute and chronic illnesses. In addition, public health and wildlife biologists have

requested more sensitive and specific assays for arthropod-transmitted pathogens to enhance monitoring of pathogen activity and to facilitate vector control efforts. As the climate warms, exotic mosquito species could negatively impact public health. Two exotic mosquitoes of Asian origin have been detected in CT; the biology, feeding and breeding habits of these species will be investigated. The transition of farmland to forest has increased tick populations due to greater deer numbers, the primary hosts for adult Ixodes scapularis ticks. This tick transmits at least three pathogens to humans, domesticated animals, and wildlife. Japanese barberry, an invasive plant in forest ecosystems, provides predator protection for mice and other rodents that are hosts for immature ticks and serve as reservoirs agents of Lyme disease and human babesiosis.

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

Statewide, we assume that regulatory, economic, environmental, and social conditions will remain sufficiently consistent with prior years. Teams will annually evaluate basic assumptions to ensure that conditions remain within acceptable limits. In addition, because we are a small state, we also are constrained by being "one-deep" in many program areas. Consequently, retirements and transfers of our scientists/faculty can create program discontinuities as we attempt to refill those vacancies.

2. Ultimate goal(s) of this Program

The primary goals of this program are to improve both human and animal health, to increase public awareness of the risks of tick- and mosquito-related diseases, as well as illnesses resulting from microbial borne illnesses including mold; to improve diagnostic tests for mammalian disease vectors; and to develop effective methods of controlling medically important disease agents. It is also important to identify emerging pathogens, such as subtypes of the Powassan virus and chickungunya virus, that may cause disease in humans, domesticated animals, and wildlife species.

V(E). Planned Program (Inputs)

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

Year	Extension		Research	
	1862	1890	1862	1890
2016	1.0	0.0	9.8	0.0

2017	1.0	0.0	9.8	0.0
2018	1.0	0.0	9.8	0.0
2019	1.0	0.0	9.8	0.0
2020	1.0	0.0	9.8	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

We are planning to conduct the following programs/activities in the Human and Animal Health planned program.

- Using DNA or RNA analysis to test ticks and mosquitoes for bacterial and viral pathogens
- Studies aimed at reducing localized populations of medically important arthropods
- Development of equipment/technologies to trap relevant arthropods
- Developing biological controls for indoor mold (fungi) problems in greenhouses and other buildings
- Characterizing the connection between dietary components and the potential biochemical nutritional bases for disease
- Develop evidence-based implementation programs for improving healthy lifestyles
- Conduct workshops and webinars
- Develop YouTube videos, and mobile apps.
- Provide training relevant stakeholder audiences
- Provide individual counseling and assessments
- Produce on-line resource materials such as fact sheets, impact statements and news articles

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

Extension

Direct Methods	Indirect Methods
● Education Class ● Workshop ● Group Discussion ● One-on-One Intervention ● Demonstrations ● Other 1 (Presentations) ● Other 2 (Posters at scientific meetings)	● Newsletters ● Web sites other than eXtension

3. Description of targeted audience

Target audiences include all individuals with a "stake" in preventing disease and improving the health of both humans and animals. This includes public health officials, regulators, elected officials, members of the scientific community and the general public.

V(G). Planned Program (Outputs)

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

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

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

V(H). State Defined Outputs

1. Output Measure

- Faces to face general group education sessions/workshops
- Individual consultations
- Fact sheets, bulletins and newsletters written or edited
- Training of undergraduate, graduate and post doctoral students
- Formal Extension outreach programs

☑ 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	# of residents gaining knowledge of ticks, mosquitoes, bed bugs, and mold
2	# of media reporters gaining knowledge of ticks, mosquitoes, bed bugs, and mold
3	Human and animal health improved through adoption of dietary and other behavioral activities by practitioners and consumers.

Outcome # 1

1. Outcome Target

# of residents gaining knowledge of ticks, mosquitoes, bed bugs, and mold

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 722 - Zoonotic Diseases and Parasites Affecting Humans
- 723 - Hazards to Human Health and Safety

4. Associated Institute Type(s)

- 1862 Research

Outcome # 2

1. Outcome Target

# of media reporters gaining knowledge of ticks, mosquitoes, bed bugs, and mold

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 722 - Zoonotic Diseases and Parasites Affecting Humans
- 723 - Hazards to Human Health and Safety

4. Associated Institute Type(s)

- 1862 Research

Outcome # 3

1. Outcome Target

Human and animal health improved through adoption of dietary and other behavioral activities by practitioners and consumers.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 307 - Animal Management Systems
- 311 - Animal Diseases
- 315 - Animal Welfare/Well-Being and Protection

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

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

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
- Competing Public priorities
- Competing Programmatic Challenges
- Other (Staffing changes)

Description

Unexpected changes in state appropriations or federal funds along with associated potential staff reductions are the most important risk factor. In addition, extreme weather conditions, amount of cooperation from collaborators, and competing public priorities are also external risk factors that could impact program performance. The research program includes laboratory studies that have high cost, but is also strongly oriented toward field work. These field investigations, which require vehicles and additional technical help, also have high costs that can be impacted by reduced funding. Drought can significantly reduce numbers of mosquitoes and ticks and, consequently, greatly affect the outcomes of field research. Although tick and mosquito research activities currently have high priority, new problems can emerge and cause funding to be diverted to new projects.

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

Depending on the specific project, different evaluation methods will be used. Post-program evaluations are planned to assess the impacts of new diagnostic tests. In tick, mosquito, and mold control research, before and after program evaluations will be used. Assessments of tick abundance at sites before control measures and after treatment will be used to determine the efficacy of biological control agents. During-program evaluations will used to determine if mosquito/encephalitis virus surveillance programs and public notification activities are effective at reducing infection risk. Effectiveness will also be determined by surveying stakeholder responses in heeding public health advisories on reducing tick and mosquito bites. Public input will be considered in the evaluation process to ensure direct benefits to stakeholders and to monitor short-term learning changes.

V(A). Planned Program (Summary)

Program # 4

1. Name of the Planned Program

Sustainable Environments

2. Brief summary about Planned Program

The Sustainable Environments planned program's primary emphasis is to address critical environmental priorities that improve air, soil, and water quality; protect watersheds; promote fish and wildlife management; and protect and improve ecosystems and the services they provide.

At UConn, sustainable environments' is strongly focused on the use of geospatial technologies to promote smart growth while conserving the natural resource base. Programs provide research-based training for municipal officials that incorporate geospatial technologies allows them to better manage existing natural resources. Connecticut is a water-rich state. However, local development can create substantial pressure on and competition for water resources. By linking water resource planning and land use planning, we can promote sustainable development.

The green industry accounts for approximately two billion dollars annually in the Connecticut economy, and is a critical element of the state's agricultural sector. However, it often is overlooked due to the considerable focus on food and food security. This program area is focused on developing new tools and technologies that promote safe and healthy green spaces across the state. Research and extension programs focus on Integrated Pest Management (IPM) approaches for schools and other municipal areas. Programs also address tools and techniques for groundskeepers to improve management of inputs on recreational areas.

At CAES, field and laboratory research will be conducted on heavy metals and organic chemicals in soil, sediments and water. New instrumentation will continue to be used to evaluate sediments, waters, and lobsters for synthetic pyrethroid insecticides. The environmental implications of nanotechnology, including ecosystem fate and effects, will be assessed. Moreover, surveys of lakes and ponds for invasive weeds will be conducted throughout the state to determine distribution and the conditions which favor their establishment and dominance. Changes in aquatic species abundance and distribution will be recorded by using global positioning system (GPS)-based bathymetric vegetation mapping procedures. The current research program on invasive aquatic plants is heavily field oriented, has existed for more than 10 years, and is expected to extend for several years into the future. Consistent with stakeholders' requests, pollution prevention and mitigation and watershed protection and management will continue to be primary focus areas for this planned program. Novel programs seeking to strategically use chemical control measures will also continue. Two new scientists at CAES will initiate research projects under this program; one will address the ecophysiology of urban trees in a changing climate and the second will address how microbes respond and contribute to important climate and biogeochemical cycles.

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	10%		5%	
104	Protect Soil from Harmful Effects of Natural Elements	5%		3%	
111	Conservation and Efficient Use of Water	5%		3%	
112	Watershed Protection and Management	25%		30%	
123	Management and Sustainability of Forest Resources	0%		5%	
124	Urban Forestry	5%		3%	
125	Agroforestry	5%		3%	
131	Alternative Uses of Land	5%		3%	
132	Weather and Climate	5%		3%	
133	Pollution Prevention and Mitigation	0%		24%	
135	Aquatic and Terrestrial Wildlife	0%		3%	
136	Conservation of Biological Diversity	0%		3%	
205	Plant Management Systems	0%		3%	
216	Integrated Pest Management Systems	5%		3%	
608	Community Resource Planning and Development	15%		3%	
903	Communication, Education, and Information Delivery	15%		3%	
	Total	100%		100%	

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

1. Situation and priorities

Nearly sixty percent of the State of Connecticut is forested and approximately eighty percent of that land is privately owned. Private forest owners need tools and technologies to improve management of these resources to protect soil, water, and air quality and provide habitat for native species. The 169 towns in the state have limited capacity to use geospatial tools to improve resource management. There is a need to expand training opportunities for local governments that increases their capacity to address land management issues at the local, state, and regional level.

Statewide, concerns have arisen regarding the application of pesticides on home lawns, municipal green spaces, and school lawns and athletic fields. Science and education is needed to develop and implement best management practices that promote safe and effective use of pesticides. There is also an opportunity to promote use of native species in landscaping to achieve improved water quality and availability.

Organic pollutants, heavy metals, and engineered nanomaterials have contaminated many ecosystems around the world. Persistent organic pollutants such as chlorinated hydrocarbons were banned decades ago but continue to persist in soil. Pesticides such as synthetic pyrethroids have entered surface and groundwater and heavy metals are present within many urban areas and at industrial sites. New pesticides and novel engineered nanomaterials have seen large increases in use and novel analytical platforms need to be developed, validated and implemented. Since pollutants in soil and water can accumulate in animal tissues, this issue is a concern for many stakeholders. Detection and removal of pollutants, including invasive plants, from soil and water is a high priority. Biologically, invasive aquatic plants are spreading in lakes and ponds, likely driven by a changing climate. The potential for the introduction of new exotic, invasive plants is projected to increase, creating concerns over economics, public safety and ecosystem health. Experiments to minimize herbicide use will continue and the development of integrated biological controls for invasive aquatic plants will be explored. Additional work is needed to increase the efficiency of pollutant remediation, to minimize agrichemical use so as to protect watersheds, to develop sensitive detection platforms for pollutants in the environment, and to determine the sources of contamination. New programs on how a changing climate can impact urban tree species and soil microbial communities will be initiated. The results of this research program will improve soil and water quality in different ecosystems, help reclaim contaminated land such as industrial sites and former agricultural fields, and prevent the movement of pollutants into crops and eventually into human foods. Collaborations exist with scientists in other states and countries (Italy, China, Czech Republic, Turkey, and Kazakhstan). There is also a knowledge base on published information and state-of-the-art instrumentation available to support the research program. State and federal funds are currently in place to continue research within the program.

2. Scope of the Program

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

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

1. Assumptions made for the Program

Statewide, we assume that regulatory, economic, environmental, and social conditions will remain sufficiently consistent with prior years. Teams will annually evaluate basic assumptions to ensure that conditions remain acceptable limits. Stakeholders believe that the research initiatives are important, are of national relevance, and should be supported by state and federal funds. There currently is a stable workforce of experienced staff for this program and strong collaborations with both domestic and international colleagues exist. Past and ongoing successes indicate that the research approaches are valid, and published findings by other scientists support the overall research strategies. Moreover, the practices being followed by our researchers are being used by other scientists. It is expected that continued studies of lakes and ponds will be effective in detecting and removing invasive aquatic plants and at improving water quality. Stakeholder volunteers in lake associations will continue to assist in monitoring for invasive plants attached to boats and remove debris as needed. Novel detection and analytical techniques for emerging chemicals has occurred and will continue. New research on how urban

trees and microbes respond to a changing climate will expand this program. It is also assumed that USDA funds, used to start research programs, will continue to leverage other federal and private funding sources.

2. Ultimate goal(s) of this Program

The ultimate goal of this program is to make continued progress toward sustainable development with a focus on improved resource management in Connecticut. Specific goals are to promote greater public awareness of sources of pollution and of potential remedial options, to take steps to promote sustainability and prevent pollution, to improve watershed conditions, to increase knowledge of the presence and fate of specific pollutants and heavy metals in soil/sediment and water, to develop sustainable programs for long-term protection of soil and water resources, and to increase understanding of the impact of a changing climate on biota. We will also improve the quality of community green spaces and promote best management practices to improve products and services.

V(E). Planned Program (Inputs)

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

Year	Extension		Research	
	1862	1890	1862	1890
2016	4.0	0.0	6.9	0.0
2017	4.0	0.0	6.9	0.0
2018	4.0	0.0	6.9	0.0
2019	4.0	0.0	6.9	0.0
2020	4.0	0.0	6.9	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

We are planning to conduct the following activities in this program:

- Use of new methods to remove pollutants from soil and water
- Development of new platforms to detect pollutants
- Chemical analysis to determine need for fertilizers
- Evaluation of invasive plants for strategic management practices
- Conduct workshops and webinars
- Develop YouTube videos and mobile apps
- Provide training to relevant stakeholder audiences fact sheets, impact statements and news articles

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

Extension

Direct Methods	Indirect Methods
● Education Class	● Public Service Announcement
● Workshop	● Newsletters
● Group Discussion	● TV Media Programs
● One-on-One Intervention	● Web sites other than eXtension
● Demonstrations	● Other 1 (Youth - via teachers)

3. Description of targeted audience

Target audiences include all individuals with a "stake" in providing sustainable environments. This includes elected municipal officials, municipal land use staff and commissioners, researchers, city/town volunteers and citizens, state environmental and agriculture regulators. Efforts will be made to contact under-represented and under-served groups, including women, members of minority organizations, and children.

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

- Face to face general group education sessions/workshops
- Individual consultations
- Fact sheets, bulletins and newsletters written or edited
- Training of undergraduate, graduate and post doctoral students
- Formal Extension outreach programs

☑ 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 homeowners gaining knowledge about watershed protection and soil and water quality
2	Number of lakes and ponds surveyed and/or cleared of invasive aquatic plants
3	Improved climate mitigation strategies and their adoption
4	Development of new knowledge in land use resource protection
5	Increase knowledge and use of geospatial technologies

Outcome # 1

1. Outcome Target

Number of homeowners gaining knowledge about watershed protection and soil and water quality

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 102 - Soil, Plant, Water, Nutrient Relationships
- 104 - Protect Soil from Harmful Effects of Natural Elements
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management

4. Associated Institute Type(s)

- 1862 Research

Outcome # 2

1. Outcome Target

Number of lakes and ponds surveyed and/or cleared of invasive aquatic plants

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 102 - Soil, Plant, Water, Nutrient Relationships
- 104 - Protect Soil from Harmful Effects of Natural Elements
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 135 - Aquatic and Terrestrial Wildlife
- 136 - Conservation of Biological Diversity
- 205 - Plant Management Systems

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 3

1. Outcome Target

Improved climate mitigation strategies and their adoption

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 132 - Weather and Climate
- 133 - Pollution Prevention and Mitigation
- 136 - Conservation of Biological Diversity
- 608 - Community Resource Planning and Development
- 903 - Communication, Education, and Information Delivery

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 4

1. Outcome Target

Development of new knowledge in land use resource protection

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 131 - Alternative Uses of Land
- 132 - Weather and Climate
- 136 - Conservation of Biological Diversity
- 608 - Community Resource Planning and Development
- 903 - Communication, Education, and Information Delivery

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 5

1. Outcome Target

Increase knowledge and use of geospatial technologies

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 123 - Management and Sustainability of Forest Resources
- 131 - Alternative Uses of Land
- 132 - Weather and Climate
- 608 - Community Resource Planning and Development
- 903 - Communication, Education, and Information Delivery

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

- Economy
- Appropriations changes
- Competing Public priorities
- Other (Staff changes)

Description

The main external factors that directly affect outcomes are financial stability and unexpected changes in the workforce. With ongoing economic limitations, state appropriations may be unstable and competition for federal grants will be greater. Although Hatch funds are helpful in supporting this research, these funds will likely be insufficient to sustain research activities over the long term. Also, compared to the other three research programs, there have been relatively higher turnover rates for employees in this research program.

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

Since the research effort is considered short term based on current needs and is prone to rapid shifts in priorities depending on immediate sustainable environment issues, it is most appropriate to plan effectiveness evaluations "during the program." Before and after program evaluations will also be conducted where appropriate. Stakeholders will offer written feedback on how well they think the research and services are yielding relevant findings and providing direct benefits. This approach

provides assessment of knowledge changes following public meetings or direct one-on-one interactions. In addition, direct feedback on performance is available via agency response to submitted progress reports on specific projects. Also, the Science Citation Index and Google Scholar will be used to assess recognition and impact of published articles by the scientific community.

V(A). Planned Program (Summary)

Program # 5

1. Name of the Planned Program

4-H/Youth Development

2. Brief summary about Planned Program

The 4-H/Youth Development planned program is focused on creating safe, healthy, well-educated children and teens through 4-H clubs, afterschool programs and interactive learning experiences. In addition, our educational efforts focus on incorporating the following three areas of curriculum into youth development programs and activities:

1. Science, Technology, Engineering and Math (STEM)
2. Citizenship and Leadership
3. Healthy Lifestyles

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

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

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

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

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
205	Plant Management Systems	10%		10%	
307	Animal Management Systems	10%		10%	
703	Nutrition Education and Behavior	10%		10%	
724	Healthy Lifestyle	20%		20%	
806	Youth Development	50%		50%	
	Total	100%		100%	

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

1. Situation and priorities

Teams will work with citizens to fully describe the current situation. Priorities will be established by teams working with youth and volunteers involved in this planned program. Involvement in an informal educational program focusing on STEM, Citizenship/leadership and Healthy Lifestyles, provides youth with challenges, experiences, support and help that fosters positive attitudes toward their future and provides them with coping skills to be successful in today's world. In addition, according to the U.S. Department of Commerce's Economic and Statistics Administration, over the past decade the number of STEM field jobs

grew three times faster than non-STEM jobs and STEM career employees can earn 26 percent more than their non-STEM counterparts. Also, research shows that caring adults play an essential role in the healthy development of youth. Childhood obesity and food nutrition are growing concerns nationwide, teaching youth healthy choices can lead to a healthier adult population.

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

We assume that economic, environmental, and social conditions will remain sufficiently consistent. Each year, teams will evaluate basic assumptions to ensure that conditions are within acceptable limits.

Additional assumptions made for the 4-H/Youth Development planned program include:

- 4-H youth development staff has the skills and knowledge to respond to the needs of Connecticut's youth and facilitate non-formal education opportunities.
- 4-H is dependent on well-trained volunteers
- 4-H is a proven youth development program for building confident, caring, contributing citizens.

2. Ultimate goal(s) of this Program

The goals for our program are to:

1. Engage youth in science, technology, engineering and math (STEM) interactive activities by providing 4-H program opportunities and career experiences.

2. Implement 4-H youth programs that promote and teach positive life skills including leadership, citizenship, decision-making, and healthy lifestyles. We will develop youth programs around content supported by specialists in one or more of our other five planned program areas.

V(E). Planned Program (Inputs)

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

Year	Extension		Research	
	1862	1890	1862	1890
2016	7.0	0.0	0.1	0.0
2017	7.0	0.0	0.1	0.0

2018	7.0	0.0	0.1	0.0
2019	7.0	0.0	0.1	0.0
2020	7.0	0.0	0.1	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

We are planning to conduct the following programs/activities in our 4-H/Youth Development planned program:

- Conduct workshops and webinars
- Develop YouTube videos and mobile apps
- Provide volunteer training programs
- Provide individual counseling and assessments
- Produce on-line material such as fact sheets, impact statements and news
- Develop research-based curricula
- Conduct after-school programs
- Conduct youth employment programs
- Conduct camps

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

Extension

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

3. Description of targeted audience

Youth, their families, school personnel, youth-serving agencies and organizations, community organizations and agencies. Volunteers involved with youth and adults.

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

- Face to face general group education sessions/workshops
- Individual consultations
- Fact sheets, bulletins and newsletters written or edited
- Training of undergraduate, graduate and post doctoral students
- Formal Extension outreach programs
- After-school programs (sites) conducted or organized

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

V(I). State Defined Outcome

O. No	Outcome Name
1	Number of youth indicating increased knowledge or skills in one or more of the nine 4-H program emphasis areas

Outcome # 1

1. Outcome Target

Number of youth indicating increased knowledge or skills in one or more of the nine 4-H program emphasis areas

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 205 - Plant Management Systems
- 307 - Animal Management Systems
- 703 - Nutrition Education and Behavior
- 724 - Healthy Lifestyle
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

- Economy
- Appropriations changes
- Public Policy changes
- Competing Programmatic Challenges

Description

{NO DATA ENTERED}

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

An improved evaluative component is being developed by our team of faculty and field educators as part of our 4-H/Youth Development planned program business model. Through a variety of evaluation tools, including: pre-testing, time series and post-testing, Extension educators will survey participants utilizing both written and internet based methods. Team leaders will review the program for educational value to ensure the programs remain significant and relevant to their intended goals. In addition, the CT 4-H team is committed to using the nationally developed common measures as an evaluation tool for the three program areas of STEM, Citizenship/leadership and Healthy Lifestyles.

V(A). Planned Program (Summary)

Program # 6

1. Name of the Planned Program

Community and Economic Development

2. Brief summary about Planned Program

Citizens in the state of Connecticut exhibit the greatest income disparity in the nation when comparing the highest incomes and the lowest incomes in the state. Old urban centers often lack opportunities for new wage earners, particularly those from minority backgrounds. UConn Extension provides creative, innovative, timely and objective scientific research and education to help Connecticut entrepreneurs analyze their options, enhance production and improve their businesses through sustainable methods. Our programs provide families and communities with programs that teach Connecticut residents how to lead healthy, productive, and financially secure lives. UConn provides citizens with a link to specialists and current research in priority areas identified by our stakeholders. Our programs will focus on improving conditions for families and communities through leadership development, community planning and technology training.

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
724	Healthy Lifestyle	25%		25%	
801	Individual and Family Resource Management	25%		25%	
802	Human Development and Family Well-Being	25%		25%	
903	Communication, Education, and Information Delivery	25%		25%	
	Total	100%		100%	

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

1. Situation and priorities

Teams will work with citizens to fully describe the current situation. Priorities will be established by the teams working with planned program stakeholders. In addition, municipalities depend on citizen volunteers to serve on community boards, planning committees, serve as youth development coaches, disaster relief workers, as well as elected officials. UConn Extension activities and programs offer non-

formal educational opportunities that develop caring, quality, contributing community members.

2. Scope of the Program

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

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

1. Assumptions made for the Program

We assume that economic, environmental, and social conditions will remain sufficiently consistent. Each year, teams will evaluate basic assumptions to ensure that conditions are within acceptable limits. Additionally, the community and economic development planned program assumes that UConn Extension staff has the knowledge, skills, and resources to respond to the needs of Connecticut's families and communities by providing non-formal education opportunities.

2. Ultimate goal(s) of this Program

The Community and Economic Development goals include:

1. To provide programs and activities that build upon an individual's strengths and life experiences to develop their leadership skills, parenting skills, and financial competencies.

2. To conduct sustainable living programs, with a focus on urban communities, that contribute to healthy living, as well as improved overall health and economic conditions.

V(E). Planned Program (Inputs)

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

Year	Extension		Research	
	1862	1890	1862	1890
2016	1.0	0.0	0.1	0.0
2017	1.0	0.0	0.1	0.0
2018	1.0	0.0	0.1	0.0
2019	1.0	0.0	0.1	0.0
2020	1.0	0.0	0.1	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

We are planning to conduct the following programs/activities in our Community and Economic Development planned program:

- Conduct workshops and webinars
- Develop YouTube videos and mobile apps
- Provide volunteer training programs
- Provide individual counseling and assessments
- Produce on-line material such as: fact sheets, impact statements and news
- Develop research-based curricula

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

Extension

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

3. Description of targeted audience

Parents, youth, children, teachers, elected officials and policy makers

V(G). Planned Program (Outputs)

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

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

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

V(H). State Defined Outputs

1. Output Measure

- Face to face general group education sessions/workshops
- Individual consultations
- Fact sheets, bulletins and newsletters written or edited
- Training of undergraduate, graduate or post doctoral students
- Formal Extension outreach programs

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

V(I). State Defined Outcome

O. No	Outcome Name
1	Number of program participants indicating increased leadership, parenting, or financial management skills

Outcome # 1

1. Outcome Target

Number of program participants indicating increased leadership, parenting, or financial management skills

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 724 - Healthy Lifestyle
- 801 - Individual and Family Resource Management

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

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

Description

{NO DATA ENTERED}

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

Through a variety of evaluation tools including pre-testing, time series and post testing, Extension educators will survey participants utilizing written and internet based methods. Team leaders are asked to review processes for educational value to ensure planned programs are being followed and that programs remain significant and relevant. An improved evaluation component is also being developed by our team of faculty and field educators as part of the Community and Economic Development business planning model.