2015 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 2015 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.

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

Year	Extension		Research	
	1862	1890	1862	1890
2015	63.0	null	80.0	null
2016	63.0	null	80.0	null
2017	63.0	null	80.0	null
2018	63.0	null	80.0	null
2019	63.0	null	80.0	null

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 utilizing one outside reviewer will be used to evaluate USDA grants. Proposals will be subject to merit and peer review using the NSF model (NSF-99-172). Experimental findings will continue to be subject to the merit and peer-review process by appropriately qualified persons. Research priorities will be based on stakeholder input and state needs. Projects will be prepared by scientists after consultation with the respective Department Head and will be independently reviewed by other qualified scientists within or outside the Station. The Director gives final approval for submission. The review process adheres to ethical standards on research integrity. All scientists and technicians have received internal training on scientific integrity. The merit of the proposed scientific work will be evaluated to ensure that the planned research addresses established priorities that are consistent with stakeholders' needs, meets state and USDA program criteria and goals, 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, and value of the work to the scientific community and public. Station scientists are encouraged to publish in peer-reviewed journals and to also write reports and bulletins for the general public. Although emphasis is placed on peer-reviewed journals for reporting scientific advancements, significant effort will continue to be made to convey information to persons who do not have scientific backgrounds. Fact sheets, pest management guides, and the Station's Record of the Year will be made available on the CAES website. As deemed appropriate by the Director, project findings may also be disseminated by 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 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 and suggests qualified reviewers and is the ultimate authority to finally approve 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 25 Hatch, 7 Multi-state and 6 McIntire-Stennis projects. There are extensive external and internal linkages, such as in the participation in the US FDA's Food

Emergency Response Network (FERN) and National Plant Diagnostic Network (NPDN). Stakeholders have identified the following issues : (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, immediate solutions can be found, such as controlling insect and plant pathogens but most critical issues are complex and often require long-term research efforts. The multistate and integrated programs offer many advantages and enhance efforts to achieve goals. Scientists with different educational backgrounds in multiple disciplines will work together in designing experiments and evaluating results. Equipment and human resources will be pooled across state lines, experiments will be conducted in different settings, and key reagents/consumables will be shared. This regional or national approach, with unique capacities of the participants, is the most efficient way of addressing all of the above-stated critical issues of strategic importance. The extension component with Cornell, the University of Connecticut, 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 critical issue will be addressed using both state and federal resources. The Department of Analytical Chemistry receives samples of food and consumer products from other Connecticut state agencies for analyses per state statute and also receives samples as a part of FDA FERN. Scientists in this department will also collaborate with Federal Bureau of Investigation Special Agents of the Weapons of Mass Destruction Directorate, personnel in the 14th Civil Support Team of the CT National Guard, researchers in other states, and with federal scientists and officials in the US EPA. Standardized equipment, reagents, consumables and expertise will be shared among collaborators.

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. In 2015, the 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

Since these research initiatives are broad-based, all persons 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 disease; (5) safer foods to eat; and (6) by having less pollution problems due to indoor mold and invasive plants. There are specific research initiatives planned to assist the under-served and under- represented individuals in CT. There has been a notable increase in Hispanic and Asian populations and requests were received from these stakeholders to evaluate the following specialty crops: calabaza, jilo, edamame, vegetable amaranth, beach plums, personal-sized watermelons, and artichokes. Black and Asian stakeholders have requested that leeks, pak choi, daikon radish, Chinese cabbage, garlic, okra, and sweet potatoes be introduced to so that they can be sold in local markets. These studies are part of the New Crops Program. Assistance will continue to be given to two Native American tribes in CT on forest management practices. CAES has a strong outreach

program, which transfers findings and services to under-served and under-represented individuals. We distribute written information in Spanish and Chinese and educate high school teachers and students that visit Station's facilities. Minority applicants and women are sought for Postdoctoral Research Scientist and durational positions. The latter are located by advertising in newspapers, contacting school officials, and meeting students at science fairs. Efforts will be made to have one scientist, who speaks Spanish, assist stakeholders who wish to obtain arborist certification. Results from two multistate and integrated programs are printed in Spanish to reach stakeholders. A fact sheet on bed bugs has been written in Spanish, French, and Chinese. A fact sheet on boxwood blight was written in Spanish. Staff members at the Station will cooperate with school officials and teachers statewide and will participate in Farm/City Week to encourage children to see experimental plots and learn about science. Other children and teachers attend a Station open house in August to meet scientists and learn about research findings. Also, at harvest, tens of thousands of pounds of produce 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

Station scientists will collaborate extensively with colleagues at US and international universities, 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 the needs identified by stakeholders. Extension occurs through interactions with the Univ. of CT, Univ. of MA, and Cornell Univ. One mandated statutory function is to disseminate IPM research results to Cooperative Extension at the Univ. of CT. The Station's diagnostic services assist the Univ. of CT and are linked to Cornell Univ. through the National Plant Diagnostic Network. Multistate, integrated programs will: (1) secure economic benefits for stakeholders, (2) convince stakeholders to use IPM practices, and (3) inform residents about human diseases associated with ticks and mosquitoes to help mitigate risk. The development of more efficient farming programs is a high priority within multistate projects. In nurseries, for example, it is expected that the implementation of monitoring systems for pests and effective use of biological controls will provide economic benefits associated with reduced costs for chemicals, resulting in less exposure to pesticides, and reduced leaching into watersheds. Similarly, new cultural, biological, and other control options for managing weevil species will help reduce economic and environmental costs associated with pesticide use. It is expected that research will identify more efficient uses of nutrients in greenhouses and in the field and determine what new specialty crops will result in increased profits for farmers. Outreach efforts will inform under-served and under-represented residents that progress has been made on providing quality food of interest to these stakeholders. Our human health planned program will monitor changes in virus infection rates in mosquitoes, develop more sensitive and specific diagnostic antibody assays, and will identify methods, particularly alternatives to pesticides, for reducing ticks on private and municipal properties. Long-term experiments will be conducted to reduce ticks by decreasing deer herds. A trap-monitoring device will be evaluated for bed bug

detection in dwellings. The expected outcomes will be improved, higher yielding crop systems, reduced farm costs, and more healthy human and domestic 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 multistate and integrated programs are designed to have interdependency and will result in improved program effectiveness and efficiency. Declining financial and human resources and rising costs for research have made it difficult for a given scientist to achieve goals without collaborators and federal grant funding. Multistate funds can leverage other grant funds to boost resources. Collaborating scientists, who also have extension appointments at Cornell, the University of Massachusetts, or the University of Connecticut, offer added expertise and will improve program efficiency by disseminating research results to a broader base of stakeholders. As examples of how multi-state projects improve program effectiveness, we note 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 is focusing on plant-parasitic nematode management as a component of sustainable soil health in horticultural and field crop production systems, and 4) NE1043 which focuses on the management of emerging vector-borne zoonotic diseases in the US. In addition, separately acquired competitive funding will be sought by CAES scientists and can support improved effectiveness in 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 open houses to tour Station facilities, meet staff, and see experimental plots. Scientists can target stakeholders and invite citizen input at public meetings, oral presentations to citizens' groups, through the use of media to announce Station findings, by responding to public inquiries, and serving on stakeholder advisory boards. Following talks, question and answer periods are useful in receiving input. Submitted stakeholder comments will help in adjusting research priorities. More than 20,000 stakeholders benefit directly from CAES programs each year. Agricultural, public health, and environmental problems generate considerable stakeholder interest and encouraging the public's participation in research is often not difficult. Local health departments work with station staff in developing pest control programs. Nursery growers donate plants for studies and closely follow research progress. Special efforts will be made to reach under-served and under-represented groups. These actions have stimulated interest among Blacks, Hispanics and Asians and resulted in requests for us to grow vegetables of interest to these groups. Tens of thousands of people see Station exhibits annually at major events, such as the Hartford Flower Show and Eastern States Exposition. Members of the Experiment Station Associates (ESA) will promote the scientific activities of the Station and 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, as part of the Centennial Celebration of Cooperative Extension, a full-day stakeholder input session is being organized to solicit ideas for 21st century Extension programs. This stakeholder input session is focused around three critical themes: Food, Health, and Sustainability. Stakeholders will be asked to identify critical needs in these three areas and they will assist in developing programs to meet these needs. In 2014, the University of Connecticut will release a bold, new Academic Plan. Concurrently, the College of Agriculture and Natural Resources (CANR) is creating an academic plan that cascades from the campus-wide plan. Once completed, the plans will be shared with stakeholder groups to further connect UConn research and Extension programs with the needs of the state. CANR 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 CANR 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

Several methods will be used to identify and collect input from individuals and stakeholder groups. Stakeholders are defined as persons who have the opportunity to use or conduct agricultural or public health research and benefit from outreach activities in the state or nation. Experiment Station staff members are available to give talks to agricultural and forestry organizations, civic groups, and students at all levels of education. Those interested in hearing about and using scientific results are stakeholders. In addition, farmers and other people who visit Experiment Station displays at agricultural fairs and other events, attend public meetings and listening sessions at Station facilities, and who request information and assistance by phone, written communication, social media, or by visiting Station laboratories and field plots are identified as stakeholders. The Science Citation Index and Google Scholar identify scientists in other institutions who use the Station's published works. Although advisory committees, listening sessions, and needs assessments are important processes of identifying individuals and receiving input, the use of surveys/evaluations at public meetings, workshops, and similar events will be relied on more heavily to receive stakeholder input. The CAES is committed to facilitating equality of service and ease of access to all research, service, and outreach activities. Although this policy allows for multiple mechanisms to reach and identify non-traditional and traditional stakeholders, we have found that direct contact with people is 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 input. The Station utilizes different methods to identify stakeholders and receives their input on past achievements, identifying problems, and on planning research. Stakeholders consist of scientists, legislators and staff, business owners, municipal officials, administrators, forestry officials, landscapers, industry personnel, state and federal workers, students, and consumers of agricultural products are stakeholders. Some of these persons have opportunities to use or conduct research activities. Growers, who implement IPM programs or other more cost-effective farming practices, are examples of primary beneficiaries. Open house events and meetings on special issues will be held to allow people to hear presentations and provide written comments. Open listening sessions will be held to meet with more specialized groups. A variety of methods will be relied on to collect stakeholder input. 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 summarizing verbal suggestions. Verbal comments may be entered into computer databases for later consideration and possible shifts in program activities. When scientists attend growers' meetings, they will invite stakeholders to participate in research programs and to provide input on experimental design as appropriate. For example, 7 multistate research projects are designed to investigate a variety of agricultural problems. Many other experiments will continue to be conducted on growers' farms or in greenhouses so that these people can be directly involved with the research and can receive immediate results. 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 Station research and to comment on the programs.

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 CANR 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

Comments from the public will help identify immediate problems and align research priorities. For example, experimental design is sometimes revised after receiving feedback from growers on field studies or trials. In one case, control work on a sap beetle that attacks strawberries was ineffective and this research refocused on new ideas using strategic chemical control. 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. Stakeholder concerns about Ramorum Blight led to a special request for emergency state funds to renovate and equip a new laboratory for diagnostic testing. Bed bugs have become widespread in hotels, homes, apartments, retail centers, schools, and theaters; pest control operators and citizens routinely request information and provide feedback on control. Research on bed bug monitoring and biological control has started. Workshops were conducted to educate attendees on control of these insects. Based on stakeholder input, studies were initiated to control invasive aquatic plants. The discovery of an exotic insect pest, the small Japanese cedar longhorned beetle, was a direct result of stakeholder input. An emerging issue was identified and an emergency action plan was implemented. Studies were conducted, and a solution was found. Plants worth hundreds of thousands of dollars were shipped rather than being destroyed under quarantine regulations. Fruit growers asked for assistance on monitoring and control of the brown marmorated stink bug. 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 guidance. Stakeholder suggestions on topics to be covered at these meetings will identify relevant issues, improve communication, and make these events more meaningful for everyone. 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 Director for consideration. The Director of the Station will then discuss the issues at regular 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

S. No.	PROGRAM NAME
1	Food Safety
2	Food Security and Food Systems
3	Human and Animal Health
4	Sustainable Environments
5	4-H/Youth Development
6	Community and Economic Development

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 area is focused on ensuring a safe food supply in the state 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, 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 Agriculture Experiment Station (CAES) is mandated to analyze foods and other consumer products for label compliance and unwanted chemicals at the request of other state agencies. This responsibility now includes federal partners, such as the FDA Food Emergency Response Network (FERN), 14th Civil Support Team of the CT National Guard,and the Federal Bureau of Investigation Weapons of Mass Destruction Directorate. The Station was one of 8 original state laboratories selected for funding as part of a cooperative agreement with the USFDA FERN. The FERN program is designed to respond to chemical terrorist activities or other national emergencies. The US FDA recently requested CAES assistance with validating methods to determine total arsenic and arsenic species in juice and rice. Additional FERN work includes ongoing joint work with the FDA Forensic Chemistry Center and two other state FERN laboratories (CA, FL) on the use of high resolution liquid chromatography with mass spectrometry to screen food for hundreds of pesticides and other chemicals of concern. Food items will also be selected by the Connecticut Department of Consumer Protection as a part of market basket surveys. Local produce and imported foods will be included in routine analyses for unwanted chemicals. Additionally, honey bees, flowers, nectar, and pollen will be tested for neonicotinoid 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 and mass spectrometry methods will be used to detect plant toxins in food and water. A new initiative will include the testing for the fate and effects of engineered nanomaterials agricultural systems.

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%		5%	
206	Basic Plant Biology	0%		5%	
212	Pathogens 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

Based on stakeholder input, food safety is a high priority area for research. In view of recent instances of contaminated foods, people remain very concerned about unwanted chemical, biological and physical hazards 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 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 cancer and that poisons (e.g., cyanide or ricin) can be deliberately introduced into the food system. Therefore, active food surveillance and research programs for developing more sensitive and specific methods of chemical/metal detection will be undertaken by CAES scientists. Faculty researchers at the Storrs Agriculture Experiment Station are primarily focused on studies concerned with microbiological food safety hazard. The FDA FERN program allows states to participate along with federal partners in training exercises focused on incident response and technological advances; the laboratory network is designed for mutual assistance in the event of terrorism or other national emergencies. Immediate response and recovery are of paramount importance in 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 is available for this program, with instruments measuring chemicals in 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 sufficiently consistent with prior years. 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 scientists/faculty can create program discontinuities while we attempt to refill those vacancies. With regards to chemical residue analysis at CAES, there are several assumptions about the research initiative and people involved that enable anticipation of how the program will proceed. Currently, there is a relatively stable workforce, with 2 years remaining on a 5-year, $2,000,000 grant from US FDA FERN, and 3 years remaining on a related but separate 5-year $1,400,000 from FDA for Accreditation acquisition. Key personnel have therefore remained employed. We hope the FDA FERN program will continue beyond the remaining two years originally awarded; the FDA accreditation grant will end in 2017. Also, FDA officials have purchased analytical equipment to support the program and have standardized testing procedures among states. Proficiency testing is an ongoing activity within several projects under this program. There are currently sufficient state and federal funds available to perform all of the planned work. Active collaborations with state and federal scientists have strengthened the monitoring and research programs. Experienced staff has access to a substantial knowledge base and use of precision instruments. It is expected that analyses of foods and beverages will result in the prompt identification of pesticides and other unwanted chemicals and in the recall of tainted or adulterated products from the market. Test results will re-assure stakeholders that foods are safe to consume.

2. Ultimate goal(s) of this Program

The overall goal is to improve food safety in the state of Connecticut and across the northeast. More specific goals within this program involve the use of active chemical surveillance and analysis to ensure safety of foods, potential development of more sensitive and specific test methods to detect chemicals, 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 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
2015	4.0	0.0	3.5	0.0
2016	4.0	0.0	3.5	0.0
2017	4.0	0.0	3.5	0.0
2018	4.0	0.0	3.5	0.0
2019	4.0	0.0	3.5	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

Extension and research efforts will use formal education classes, demonstrations, presentations to civic and teacher groups, workshops, group discussions and one-on-one interventions for direct contacts. Indirect contacts will be achieved through the use of newsletters and websites (other than eXtension) and publication of peer-reviewed scholarly manuscripts and abstracts. Direct communication will also be achieved through oral and poster presentation of research findings at scientific and industry meetings. Indirect contacts are calculated by estimating the number of persons contacted via media activities (e.g.,newspapers, radio shows, etc.). Rates of 0.05% and 0.01% will be multiplied times media audiences to estimate respective numbers of adults and youth reached concerning Station research findings.

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

3. Description of targeted audience

Target audiences include all individuals with a "stake" in providing a safe food supply. This includes producers, processors, retailers, regulators and consumers and more specifically, state and federal public health officials and regulators, law enforcement, food producers, educators, extension specialists, and the

general public. Women, members of minority organizations, and children are examples of under-represented and under-served groups.

V(G). Planned Program (Outputs)

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

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

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

V(H). State Defined Outputs

1. Output Measure

- 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 - Pathogens 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 - Pathogens 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

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

Description

The most important external factors that may directly 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.

FDA FERN and FDA Accreditation grants were cut by 10 and 17%, respectively, in 2013. Future budget deficits would have a direct impact because technical help could be laid off. Hatch funds, which are being used to purchase supplies for analyses and research, have been essentially flat for many years. Moreover, if US FDA shifts its priorities away from the chemical concerns of food safety, there could be a loss of grant funds.This might result in the release of one scientist and a technician. The collective loss of research capacity 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 rapid shifts in priorities depending on immediate food safety issues, it is most 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 learning changes following public meetings or direct one-on-one services. 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 tainted 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

The Food Security and Food Systems program area is focused on reducing food insecurity in the state of Connecticut and across the Northeast region. Research and extension programs address food production and the broader food system affecting access, waste, and distribution of food. In Connecticut, food production primarily consists of specialty crops (fruits and vegetables). There is a need to improve Best Management Practices (BMPs) for producers and incorporate pest management strategies and improved business practices. The food systems work addresses improving access to fresh fruits and vegetables for low-income families, schools in urban areas, and many state institutions.

IPM increases farming efficiency and has positive impacts locally and globally. Increased agricultural production aids efforts to meet the growing demand for food due to population pressures and a changing climate. Methods will be developed to reduce agrichemical use and to minimize exposure to pesticides. Some forest insect pests attack fruit trees; therefore, forests located near orchards need to be healthy. Screening of grape and vegetable cultivars for resistance to insect and plant pathogens is a major initiative. Studies evaluating soybean and rapeseed as cover crops to control parasitic plant nematodes demonstrate a multistate effort with an IPM component. Under this program, research includes: (1) investigations of plants and their pests; (2) development and implementation of IPM systems; and (3) enhancement of agricultural production by introducing new crops that require minimal pesticides. Experiments will be designed to control insect pests and plant diseases and increase yield; increase farm efficiency and income; and protect workers and residents from pesticide exposure. CAES is the state plant regulatory agency, responsible for monitoring detecting exotic pests, and registering and inspecting the state's nurseries and honeybee colonies. New crops will be evaluated for quality and yield in response to requests from under-represented groups. Although some goals are met in the short term, replicated field experiments take longer to complete, often occurring at different locations. Shifts in priorities within each core area occur as new concerns arise, such as the brown marmorated stink bug and spotted wing drosophila, and as problems are solved. Our websites, publication of findings, public presentations, and open house events disseminate findings to stakeholders and provide evidence of program success.

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

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

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

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

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
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 priority issues for research: addressing food insecurity, development of IPM programs, promptly solving emerging pest problems, growing crops for prevention of soil erosion, and introduction of specialty crops. Development of IPM programs is particularly important because of public concern that pesticides are over used and that these chemicals cause disease and pollute the

environment. Moreover, with rising food prices, there is increased interest in home gardening. Growers want efficient methods of pest control to reduce costs and to lessen liability due to pesticide exposure. Current work indicates that less toxic pesticides can be used to address pest problems and that IPM practices can be successful in decreasing pesticide use, human health risks, and farm costs. Also, there is stakeholder interest for specialty crops, such as calabaza, edamame, leeks, vegetable amaranth, pak choi, daikon radish, and Chinese cabbage. A major goal is to have locally grown, fresh produce consumed by students in school systems. Protecting insect pollinators from agrichemicals is a high priority. Several criteria are considered when determining research priorities. First, the problem must be of state and national relevance. Research results should have measurable economic, environmental, or health impacts. There must be adequate financial support, laboratories, and staff to conduct the research. There must be existing collaborations with domestic and international scientists to increase the likelihood of success. It is important to boost US agricultural production, improve global capacity to meet the growing food demand, and to fight hunger at home and abroad. Once emerging insects or plant pathogens are detected, remedies will be developed for immediate control. Recent success at specialty crops 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.

At CAES, there are several assumptions about the research and staff involved. Science-based assumptions are linked to past evaluations of research findings and stakeholder input. There is sufficient staff and funding to perform field and laboratory studies. There are extensive multistate and international collaborations to enhance research efforts. IPM practices will result in grower acceptance of new methods, high quality crops for consumers, reduced risks from pesticides, and less environmental degradation. Effective IPM programs are in place in CT; there is frequent communication between CAES and the UConn on IPM and related work. A joint project to evaluate ebb and flow irrigation in greenhouses and to determine the efficiency of this irrigation system at reducing plant pathogen distribution has been completed. 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. The number of acres in IPM will increase as stakeholders accept this approach. Annual crops and forest surveillance for emerging pest problems enables early detection. Early detection of pest problems leads to the development of

efficient control practices to reduce economic losses. Staff will work with stakeholders and are trained to diagnose problems and 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 ultimate goal of this planned program is to reduce food insecurity in the state of Connecticut and across the northeast. Specific goals in this program include to identify and address emerging pest problems, including the use of molecular-based detection methods when appropriate, develop and implement IPM systems, encourage growers to accept insect and disease resistant crops, and to boost agricultural and forestry production or efficiency. It is expected that this program will develop new management options, decrease agrichemical use and farm costs, diversify the local food supply, and increase income options for farmers. Moreover, a database of diagnostic records will be produced on plant pests and a Plant Pest Handbook (available at the CAES website) is available public electronic access. A web-based system for stakeholders to diagnose their pest problems is being developed.

V(E). Planned Program (Inputs)

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

Year	Extension		Research	
	1862	1890	1862	1890
2015	5.0	0.0	15.3	0.0
2016	5.0	0.0	15.3	0.0
2017	5.0	0.0	15.3	0.0
2018	5.0	0.0	15.3	0.0
2019	5.0	0.0	15.3	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 pest trapping methods
- Assessing plant resistance
- Developing biological control agents
- Use of mulching to control weeks
- Developing cultivars with maximum quality and yield
- Conduct workshops and webinars
- Develop YouTube videos and mobile apps
- Provide training to relevant stakeholder audiences
- Participate in stakeholder organizations
- Individual consultations and assessments

- Produce online resource material such as fact sheets, impact statements and newsletter articles
- Conduct an open house to allow the public to comment on findings

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	● Newsletters ● Web sites other than eXtension

3. Description of targeted audience

Target audiences include consumers, farmers/producers, agency and organizations (staff) that serve or handle food, food related businesses - processors, farmers' market masters and vendors, seafood industry processors, dealers, harvesters, importers, and regulatory personnel, researchers, and policy makers. Additional audiences are: high school teachers, state residents, the media, food bank personnel, beekeepers, maple syrup producers, seed companies, water company officials. Women, minority organizations, and children are targeted under-represented and under-served groups. 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
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

Description

{NO DATA ENTERED}

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

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 how well they think the research and services are yielding relevant findings and direct benefits. This approach provides assessment of short-term learning changes following public meetings or direct one-on-one services. In addition, direct feedback on program 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 of published articles by the scientific community for the program.

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 particular emphasis on improving health in the state of Connecticut. Research and Extension programs will address biological (e.g., microbial-based disease) and/or behavioral bases for health-related conditions in individual humans/animals and in their communities. CAES main objectives are to identify the primary mosquito vectors of encephalitis viruses, determine if ticks transmit a subtype of the Powassan virus, develop more effective methods of arthropod and mold control, and to disseminate experimental findings to stakeholders.

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

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

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

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

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
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

Research and Extension teams will work independently and through integrated approaches to identify problems/challenges most relevant to the state and region and work with stakeholders to fully describe and address the most important areas for study.

Lyme disease, tularemia, human granulocytic anaplasmosis, monocytic ehrlichiosis, human babesiosis, West Nile encephalitis, and Eastern Equine Encephalitis are public health problems of national concern. Tens of thousands of people are infected with the agents that cause Lyme disease and West Nile encephalitis virus annually in the United States. Stakeholders have expressed great concern about how ticks and mosquitoes affect their health by causing acute and chronic illnesses, which can result in emotional and financial burdens on families. Compromised health in domesticated animals can also cause economic losses. New research has been initiated on chemical control of bed bugs and developing a monitoring/ trapping system. Research on indoor mold problems, requested by public school officials, will be conducted in public buildings. Allergic reactions to mold spores have been documented for people who live or work in mold-infested work locations. Station scientists receive state and federal funding to support ongoing research on sampling arthropods, developing tests with highly specific recombinant fusion proteins to detect pathogens or antibodies to disease agents; testing blood-engorged mosquitoes

(collected in carbon dioxide baited or oviposition traps) to identify the blood source by using cytochrome b gene molecular analysis; and on developing chemical and biological methods of pest control.

There are well established collaborations among our scientists and researchers at universities, state and local health departments, and the Centers for Disease Control and Prevention (CDC). Specific efforts from CAES will involve controlling mosquitoes in catch basins (done in collaboration with municipal public health officials); some mosquito trap sites will also be located on private properties. Field tests on tick control will be conducted on homeowners' properties, which encourage direct stakeholder involvement in the research. Laboratories are well-equipped to isolate and identify pathogens. For example, the first isolate of West Nile encephalitis virus in North America was cultured in CAES laboratories, and serologic antibody tests for Lyme disease and human granulocytic anaplasmosis were among the first developed in the United States. Efforts have been made to obtain reference RNA of the chickungunya virus, which is present in Asia and Africa, to facilitate its identification should it enter the US.

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. 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 scientists/faculty can create program discontinuities while we attempt to refill those vacancies.

Furthermore, there are several assumptions about the CAES research program to insure continued success. Strong public concern about mold in buildings, bed bugs, ticks, mosquitoes, nutritional adequacy and bioactive compounds encourages further investigations by justifying objectives and financial support to state and federal legislators. With adequate grant funding, skilled technicians can be hired. The current CAES staff and resources available for studies on arthropods and the pathogens they transmit are adequate. State and federal funding has been sufficient to conduct field and laboratory studies, and laboratories are well equipped to complete the planned tasks. Numerous research collaborations exist among veteran scientists in the CDC, universities (including the University of Connecticut and Yale), the Connecticut Department of Public Health, the New York, Massachusetts and Vermont State Health Departments,municipal public health officials, and a biotech company. Past experience has shown that collaborations speed research progress and problem solving. For more than two decades, manuscripts

have been published in quality, peer- reviewed journals; the scientific knowledge base is extensive. The scientists are experienced, highly motivated, and open to developing or applying new methods. Staff members can solve technical problems and are well prepared to detect and respond to emerging pathogens that may arrive in CT as a result of climate change. Continued research on the detection of arthropod-transmitted pathogens will result in a better understanding of Lyme disease, granulocytic anaplasmosis, human babesiosis, and encephalitis and that the collaborative work will facilitate diagnosis and result in prompt and effective treatment of both people and domesticated animals.

2. Ultimate goal(s) of this Program

The ultimate goals of this program are to improve human and animal health, and specifically increase public awareness of arthropod-related diseases and risks associated with ticks and mosquitoes, as well as illnesses resulting from microbial borne illnesses including mold; improve diagnostic tests for animal vectors such as cottontail rabbits, deer, and mice; and to develop effective methods of controlling medically important disease agents. It is also important to identify new and emerging pathogens, such as subtypes of the Powassan virus, which may be causing 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
2015	1.0	0.0	9.7	0.0
2016	1.0	0.0	9.7	0.0
2017	1.0	0.0	9.7	0.0
2018	1.0	0.0	9.7	0.0
2019	1.0	0.0	9.7	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

Extension and research efforts will use formal education classes, demonstrations, presentations to civic and teacher groups, workshops, group discussions and one-on-one interventions for direct contacts. Indirect contacts will be achieved through the use of newsletters and websites (other than eXtension) and publication of peer-reviewed scholarly manuscripts and abstracts. Direct communication will also be achieved through oral and poster presentation of research findings at scientific and industry meetings.

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

- Using DNA or RNA analyses 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
- Characterizing the connection between dietary components and the potential biochemical nutritional bases for disease
- Develop evidence-based implement 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	● 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 humans and animals. This includes producers, processors, retailers, regulators, members of the scientific community and consumers.

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 consuultations
- 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, staff reductions, extreme weather conditions, amount of cooperation from collaborators, and competing public priorities are the most important risk factors. The research program includes laboratory studies, which have high cost, but is also strongly oriented toward field work. These field investigations, which require vehicles and extra technical help, also have high costs. Cuts in the state funding, layoffs of technicians, and reduced federal and grant funds related to budget deficits or priorities can greatly reduce capacity and immediately affect outcomes. 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 unrelated problems can emerge and cause important funds to be diverted to start new work.

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

Depending on the research project, different forms of evaluation 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 are appropriate. Assessments of tick abundance at sites before control measures and after treatment will be used to determine the efficacy of biological control agents (Metarhizium anisopliae and Beauveria bassiana). During-program evaluations will be relied on to determine if mosquito/encephalitis virus surveillance programs and public notification activities are reducing the risk of infection. Effectiveness will be measured by surveying stakeholder responses in heeding public health advisories on reducing tick and mosquito bites. In each case, public

input will be considered in the evaluation process to determine if there are direct benefits to stakeholders and if there have been 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 broad emphasis is to address critical environmental priorities that contribute to improved air, soil, and water quality; protection of watersheds; fish and wildlife management; and protection and improvement of ecosystems and the services they provide.

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 allowing 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 in the Connecticut economy each year, which is a critical element of the state's agricultural economy. 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 intensive field and laboratory research will be conducted on heavy metals and persistent organic chemicals in soil and water. New instrumentation has been acquired to begin assessing sediments and waters for synthetic pyrethroid insecticides. The use of certain plants (phytoremediation) shows promise in removing some pesticides from soil. In a new initiative, the environmental implications of nanotechnology will be assessed. Moreover, surveys of lakes and ponds for invasive weeds (considered pollutants) are being conducted throughout the state to determine distribution and the conditions which favor their establishment. Changes in aquatic species abundance and distribution will be recorded by using global positions system (GPS)-based bathymetric vegetation mapping procedures. For each treated lake or pond, GPS-derived transects will be utilized. Consistent with stakeholders' requests, pollution prevention and mitigation and watershed protection and management are the primary focus areas for research in this planned program. Novel programs seeking to strategically use chemical control measures will continue. The current research program on invasive aquatic plants is heavily field oriented, has existed 10 years, and is expected to extend for more than 3 years. The project on detecting persistent organic pollutants in cucurbits is nearly completed and may transition to field trials at other sites if appropriate locations, partners, and funding can be secured.

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

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

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

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

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
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.

Persistent organic pollutants and heavy metals have contaminated many ecosystems around the world. Chlorinated hydrocarbons were banned many years ago but continue to persist in the soil. Herbicides have entered groundwater and heavy metals are present at industrial sites. New pesticides have seen large increases in use and new analytical procedures need to be developed and implemented. Since pesticides in soil can accumulate in animal tissues, this issue is a concern for many stakeholders. Skin contact with or accidental consumption of these chemicals may have public health importance by being linked to cancer and other chronic diseases. Detection and removal of pollutants, including invasive plants, from soil and water is a high priority. Cucurbits have been found to remove chlordane and other persistent organic pesticides from soil; phytoremediation methods have been effective in improving soil quality. Biologically, invasive aquatic plants are spreading in lakes and ponds, likely due to 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 will be conducted to minimize herbicide use and to develop biological controls of invasive aquatic plants. Future work is needed to increase the efficiency of removing pollutants from the environment, reduce the amounts of agrichemicals used so as to protect watersheds, develop sensitive detection methods for unwanted chemicals in the environment, and determine the sources of contamination. The results of this research program will improve soil and water quality in different ecosystems, help reclaim contaminated land such as industrial sites and agricultural fields, and prevent the movement of pollutants into crops and eventually into human foods. Collaborations exist with scientists in other states and countries (Czech Republic, Turkey, 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 the research.

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. Each year, teams will evaluate basic assumptions to ensure that conditions are within 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 and strong collaborations with experts at domestic and international universities. Past 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 monitor boats for invasive plants attached to boats and remove debris as needed. Novel detection and analytical techniques for emerging chemicals has occurred and will continue. 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 goals of this planned program is to make continued progress toward sustainable development with a focus on improved water 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 and water, and to develop sustainable programs for long-term protection of soil and water resources. 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
2015	4.0	0.0	5.6	0.0
2016	4.0	0.0	5.6	0.0
2017	4.0	0.0	5.6	0.0
2018	4.0	0.0	5.6	0.0
2019	4.0	0.0	5.6	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

We are planning to conduct the following programs/activities in the Sustainable Environments planned program:
- Use of new analytical methods to remove pollutants from soil and water
- Chemical analysis to determine need for fertilizers
- Evaluation of invasive plans for strategic management practices
- Conduct workshops and webinars
- Develop YouTube videos and mobile apps
- Provide training to relevant stakeholder audiences
- Produce online 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	● Public Service Announcement ● Newsletters ● Web sites other than eXtension

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 agency staff. Women, members ofminority organizations, and children are examples of under-represented and under-served groups, and special efforts will be made to contact them.

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 Extension
- 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 may directly affect outcomes are financial stability and unexpected changes in the workforce. With sluggish economic conditions, state appropriations may be unstable and competition for federal grants will be greater. This could impact the availability of technical help and supplies. A vacancy that exists for a scientist to work on soil quality problems may be filled in 2014 but until then, reduced research capacity could still impact the progress of field and laboratory studies. Also, Postdoctoral Research Scientists assigned to this research program are hired under durational terms with fixed funding and eventually move on to other opportunities. Although the 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 evaluations for "during the program" to assess effectiveness. Before and after program evaluations will also be conducted. 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 o fshort-term learning changes following public meetings or direct one-on-one services. In addition, direct feedback on program 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 of published articles by the scientific community for the program.

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 volunters involved in this planned program. 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 asssume 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 opportunties and career experiences.

2. Implement 4-H youth programs that promote and teach positive life skills including leadership, citizenship, decsion-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
2015	7.0	0.0	0.1	0.0
2016	7.0	0.0	0.1	0.0
2017	7.0	0.0	0.1	0.0

Year	Extension		Research	
	1862	1890	1862	1890
2018	7.0	0.0	0.1	0.0
2019	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
- Formual 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

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

Description

{NO DATA ENTERED}

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

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 surveyed participants utilizing both written and internet based methods. Team leaders review the program for educational value to ensure the programs remained significant and relevant to their

intended goals.

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 : New (One year or less)

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

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

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

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
703	Nutrition Education and Behavior	25%		25%	
724	Healthy Lifestyle	25%		25%	
801	Individual and Family Resource Management	25%		25%	
804	Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures	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 opportuniites 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
2015	1.0	0.0	0.1	0.0
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

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)

- 703 - Nutrition Education and Behavior
- 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.