

2011 North Carolina A&T State University Extension and North Carolina State University Research and Extension Combined Plan of Work

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I. Plan Overview

1. Brief Summary about Plan Of Work

This Plan represents the combined Extension programs of both North Carolina State University and North Carolina A & T State University and the North Carolina Agricultural Research Service at North Carolina State University.

Plan of Work Overview

This Plan of Work describes research and extension programs designed to discover and develop knowledge and technology that will allow North Carolinians to prosper, to better their lives.

This Plan describes research to be done through the North Carolina Agricultural Research Service (NCARS) at North Carolina State University along with outreach efforts of North Carolina Cooperative Extension at both North Carolina State University and North Carolina A&T State University.

NCARS is the research arm of the College of Agriculture and Life Sciences at North Carolina State University, which is North Carolina's 1862 land-grant university and the only Research I land-grant institution in North Carolina. In addition to serving as the College of Agriculture and Life Sciences agricultural, environmental, and biological sciences research arm, NCARS also provides the research foundation in these areas for academic and extension educational activities.

NCARS is the principal state agency for research in agriculture, life sciences, forestry, and family and consumer sciences. Research projects involve the North Carolina State University colleges of Agriculture and Life Sciences, Forest Resources, Physical and Mathematical Sciences, Engineering, and Veterinary Medicine as well as the School of Human Environmental Sciences at the University of North Carolina-Greensboro. Within the N.C. State University College of Agriculture and Life Sciences, NCARS coordinates research in 18 departments and works in partnership with the North Carolina Cooperative Extension Service and Academic Programs.

The NCARS mission is to develop the knowledge and technology needed to:

improve the productivity, profitability, and sustainability of industries in agriculture and life sciences; conserve and improve the state's natural resources and environment; and improve the health, well-being, and quality of life of all North Carolina citizens.

NCARS conducts research at facilities on and off the N.C. State University campus. On-campus facilities include highly specialized laboratories (i.e., molecular imaging, soil analysis, and x-ray crystallography), greenhouses, the Phytotron controlled environment facility, the Biological Resources Center small animal facility, Pesticide Residue Laboratories, the Animal and Poultry Waste Management Center, Feed Mill, Structural Pest Training Center, Metabolomics and Proteomics Laboratory, and Plant Transformation Laboratory. Off-campus facilities include eight field laboratories with extensive animal and crop capability and facilities for agricultural and municipal waste management research; regional research and extension centers with resident research faculty in both western and eastern North Carolina; and 18 agricultural research stations spread throughout the state, including the Center for Environmental Farming Systems, which specializes in sustainable agriculture research and extension.

The knowledge and technology developed through NCARS research is made available to North Carolina citizens through North Carolina Cooperative Extension. Both the College of Agriculture and Life Sciences at N.C. State University and the School of Agriculture and Environmental Sciences at North Carolina A&T State University work collaboratively to provide educational opportunities that are relevant and responsive to the needs of individuals, communities, counties, and the state. North Carolina Cooperative Extension is at the heart of this partnership and is the principal agency providing these educational opportunities.

Cooperative Extension's mission is to help people put research-based knowledge and technology to work to foster economic prosperity, environmental stewardship, and improve quality of life. To address ever-changing needs, Extension operates under a dynamic long-range plan. This plan changes as circumstances indicate it should. The plan focuses on three strategic priorities of concern statewide. These areas of concern are:

to strengthen the economy through profitable, sustainable and safe food, forest and green industry systems.

to protect the environment and natural resources.

to empower youth and families to lead healthier lives and become community leaders.

To achieve the plan's objectives, specialists at the two land-grant universities work hand-in-hand with field faculty stationed in all 100 North Carolina counties and on the Cherokee Reservation in the state. This work is coordinated with the

efforts of NCARS scientists.

In addition to this alliance with research faculty, Extension benefits from the input of a well-established statewide system of lay advisers, who represent the state's diverse population. And each county routinely conducts an environmental scan to determine emerging needs and appropriate educational responses. These scans give residents, advisers, commodity group representatives, volunteers, and other clients an opportunity to ensure that local programs meet local needs and priorities.

Cooperative Extension also maintains a civil rights plan that includes computer monitoring of program participation by gender and race. This effort ensures that underserved and underrepresented audiences are among those included in program development and implementation. A permanent Diversity Task Force monitors programs, suggests policy, and develops and conducts training for the organization. Stakeholder input informs all Extension programs.

This Plan of Work describes efforts by NCARS and North Carolina Cooperative Extension to meet the needs of North Carolinians.

Doubtless attracted by a temperate climate, a favorable economic climate and abundant natural resources, North Carolina's population grew significantly during the 1990s. While population growth has slowed since the turn of the century, the state's population continues to expand. Much of this growth can be attributed to an expanding Hispanic population (the state's Hispanic population grew faster than that of any other state in the 1990s) and an influx of retirees. While the state's urban areas have experienced more growth than have rural areas, most rural areas of the state have seen population increases. And despite the growth of the state's urban population, roughly half of all North Carolinians continue to live in rural areas.

The in-migration North Carolina has and is experiencing is expected to fuel dramatic economic growth in many service sectors, particularly for retirement age and Latino households. Community leaders expect to preserve the high quality of the local natural environment while also providing needed services. Rural citizens will request advanced training on creating new business opportunities. Traditional clients will continue to request assistance in evaluation of more traditional agricultural and agribusiness technology. We anticipate an increase in the number and variety of larger businesses as well as an expansion in the number of home-based, smaller scale firms starting up in the state. Both segments seek to improve the financial position of their households by enhancing business and technical skills. As a result, many small and large businesses will request assistance in learning sound money management skills. This Plan of Work describes research and outreach efforts designed to assist North Carolinians in implementing programs that promote sustainable economic development and responsible management of financial assets. These programs will make families more secure financially. This Plan is designed to integrate economic and production decision making to ensure that limited resources are managed wisely and economic value is generated.

The Plan also describes efforts to aid North Carolina families and children and to help ensure the health of North Carolinians. The rapid societal changes we see in North Carolina can challenge and stress families. We will support families by providing them with the resources needed to deal with issues created by these challenges and stresses. Research and Extension programs will give parents positive parenting skills and reduce or eliminate instances of child abuse and neglect. Consumers and families will use research and Extension programs to make and use money management plans to conserve, extend and/or increase personal family income; develop skills to help maintain and/or increase the value of their homes; and learn to create healthy, safe homes.

Research and Extension efforts will support North Carolina's children through North Carolina Cooperative Extension and Extension's 4-H Youth Development Program. The 4-H Program designs, implements and evaluates programs targeting six Long Range Focus Areas: 1) Healthy Eating, Physical Activity and Chronic Disease Risk Reduction; 2) Preparing Youth for an Employable Future and Economic Success; 3) Building Community through Volunteerism; 4) Building Citizen Leaders, 5) Developing Life Skills and 6) K-12 Academic Achievement. Through these six areas, the 4-H Program will address issues such as obesity, persistently high rates of alcohol and other drug use, teenage pregnancy, violence, and poor academic performance. Through our 4-H Program, we hope to ensure that today's children will become adults who will comprise a competent work force and engaged citizenry.

Research and Extension programs in this Plan of Work also address the health of North Carolinians. Dietary factors are associated with five of the 10 leading causes of death in our state (and in the United States), including coronary heart disease, some types of cancer, stroke, non-insulin-dependent diabetes mellitus, and atherosclerosis. Overweight and obesity have reached epidemic proportions and have become one of the most pressing health issues for our nation and state. These conditions are increasing in all age groups of all races and ethnicities. Sixty-five percent of adults in the U.S. are overweight or obese. There are almost twice as many overweight children and three times as many overweight teens today as there were two decades ago. Action by a broad array of individuals and public and private partners is essential to reverse this trend.

Efforts described in this Plan of Work are designed to help North Carolinians, including limited-resource individuals and families, improve their health and the quality of their lives by eating healthy diets, being active, managing resources for food security, and practicing health-promoting behaviors. In addition, research findings are expected to significantly impact the control and prevention of human diseases influenced by insects and other pests.

Agriculture and agribusiness represent one of North Carolina's most vital economic engines. Indeed, the food, fiber and forestry industries account for roughly a fifth of our state's income and employment. Agriculture and agribusiness are vitally important to the economic well being of North Carolina. Our state's agriculture has become more diverse to meet the

demands of a changing population and market opportunities. We produce more than 80 crops with an annual market value of nearly \$3 billion. Growers have diversified into many specialty crops, including medicinal herbs, specialty melons, heirloom fruits and vegetables, various crops for the state's growing Hispanic and Oriental populations, kenaf, sea oats, and wine grapes as well as organic production of various fruits and vegetables. Diversification has been driven in part by the decline of agricultural price supports and subsidies in North Carolina. Tobacco and peanuts no longer receive federally guaranteed prices. This means that some traditional field crops and their production systems are yielding to new crops with different tillage, water management, and harvest needs in addition to different post-harvest storage and processing requirements. Diversification has placed demands on the NCARS to develop sustainable programs for producing, protecting, harvesting, storing, and marketing these commodities, as well as on Cooperative Extension to assure that appropriate audiences are adequately educated to use the latest developments. This Plan describes these efforts.

Tobacco once dominated North Carolina agriculture and is still an important part of the state's agricultural mix. Yet animal agriculture now accounts for nearly 65 percent of our state's farm cash receipts. Animal agriculture plays an integral role in our state's agricultural economy and rural communities. Waste management is a pressing issue for animal agriculture. Mandates from state government to reduce odor and eliminate the use of lagoon/sprayfield waste treatment systems in confined animal operations are having a significant impact on the direction and urgency of research and outreach efforts. These efforts are aimed at enhancing our understanding of the physical, biological, and chemical processes and interactions influencing agricultural ecosystem impacts. Engineering solutions for animal waste management are an important part of this Plan.

We also anticipate that engineering, specifically bioprocess engineering, will play an important role in supporting the emerging biotech industry in our state and in the search for alternative fuels. At the same time, food safety and security concerns have increased, and engineering will play a role in addressing these concerns as well. Pollution prevention on a watershed scale is also a priority, and there is an increasing demand for natural designs of best management practices rather than traditional designs that are more structural in nature.

Interdisciplinary projects described in this Plan will advance our knowledge of natural processes to enable development of production management and environmental protection technologies and strategies that will increase productivity; improve input efficiency; conserve natural resources; and improve and protect environmental quality. Efforts described here will also address increasing emphasis being placed on air quality management and improvement, particularly as it relates to animal production systems.

The research and Extension efforts described in this Plan are designed to support economic development by helping agricultural producers develop sustainable production systems for traditional as well as new agricultural enterprises. Sustainable production systems will ensure a healthy and viable agricultural economy while also protecting the environment. The efforts described here will also improve quality of life in North Carolina by helping to provide a nurturing environment for children and supporting our state's families and communities. This Plan describes work that will make life in North Carolina better and North Carolina a better place in which to live.

This Plan contains nine distinctive Planned Program Areas and five NIFA priority areas. Subsumed within those nine program areas is forty-nine Program Knowledge Areas that make up the Plan's specific components. The nine Planned Program Areas are as follows:

Plant Production Systems and Health

Economic Systems Natural Resources and Environment Animals and Their Systems, Production and Health
Agricultural, Natural Resource and Biological Engineering Food Production Systems: Development, Processing, Quality, and Safety Human Nutrition and Health Families and Communities Youth Development

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

Year	Extension		Research	
	1862	1890	1862	1890
2011	400.0	41.0	425.0	0.0
2012	400.0	41.0	425.0	0.0
2013	400.0	41.0	425.0	0.0
2014	400.0	41.0	425.0	0.0
2015	400.0	41.0	425.0	0.0

II. Merit Review Process

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

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

2. Brief Explanation

For NCARS, a thorough scientific and merit review of each proposed new or revised research project is made at the departmental level prior to submission to the NCARS office. This departmental review should consist of two parts: an informal review (PI's responsibility) and a formal review (Department Head's responsibility). Cooperative Extension's work is closely coordinated with the efforts of the North Carolina Agricultural Research Service (NCARS), the research arm of the College of Agriculture and Life Sciences (CALs) at NC State University. In fact, about 100 of the 300 Extension faculty within CALs have joint appointments with NCARS, collaborating with nearly 500 Extension agents who plan and deliver educational programs across the State. This effort is further strengthened by the Extension programmatic efforts of NCA&T agents and faculty who collaborate with researchers at NCA&T as well as to use the collaborative program efforts inherent in joint and individualized programming efforts. In addition to this alliance with research faculty at both institutions, Extension benefits from the input of a well-established statewide system of lay advisers representing the state's diverse population. Also, each county routinely conducts an environmental scan to determine emerging needs and appropriate education responses. These scans give residents, advisers, commodity group representatives, volunteers and other clients the opportunity to ensure that local programs meet local needs and priorities. Stakeholder input undergirds all of Extension's efforts, as it has and continues to do in planning and implementing the new AREERA Plan of Work.

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?

Stakeholder input utilized in determining research directions is also received through numerous Associations. NCARS interacts with 90 official commodity, and agricultural industry Associations from within North Carolina. A College of Agriculture and Life Sciences administrator is appointed as the official liaison for each of these associations and attends at least one, and sometimes more, of their meetings or conferences each year. During these meetings, opinions and facts related to the needs and concerns of that industry sector are obtained through both formal presentations and informal conversations with attendees. The NCARS representative is always introduced early in the meeting so that any individual there can contact them and discuss whatever issues they desire. In addition, the college has employed a Director of Commodity Relations, who reports directly to the Dean and coordinates the activities of the liaisons. This individual also has responsibility for working with any Association that has a need or concern relative to the college's programs, particularly if it might involve any state or federal legislation. For North Carolina Cooperative Extension, there is an established system that has an active advisory leadership council for the state and for each of the one hundred counties and the Cherokee Indian Reservation. The Advisory Leadership System is a major partner in the continuous and dynamic review of program development including program planning, implementation, and assessment of Extension programs. The Advisory Leadership System has major responsibility in obtaining stakeholder input through out the program development process. Members of the State Advisory Leadership System and county Advisory Leadership Council represent geographical, cultural, ethnic, and economic diversity of the state's population. In addition to Advisory Leadership Councils, each county has specialized committees with responsibilities for review of overall programming, collaborating in needs assessments and environmental scans, and marketing extension programs and impacts. These specialized committees provide specific program input for individual commodities, issues and ongoing program needs. Membership on both the council and the specialized committees represents the diversity of the respective county population including under-served populations and retired professionals from business, extension and other relevant organizations and agencies. While the advisory council will meet quarterly, the specialized committees will meet at least annually to discuss accomplishments and needs still to be addressed and techniques to market Extension. This system is

monitored administratively to assure that stakeholders actually provide such program input and actions. In addition to being an integral part of the overall State Advisory Council, the Extension Program at NC A&T State University is also guided by a cadre of citizens who make up the Strategic Planning Council. The Strategic Planning Council includes community leaders, collaborating agency and organization representatives and individuals representing non-governmental organizations.

2. How will the planned programs address the needs of under-served and under-represented populations of the

To ensure that underserved and underrepresented audiences are among those included in program development and implementation, Cooperative Extension has established a new civil rights plan that includes computer monitoring of program participation by gender and race, including goals and plans for assuring that all persons have equal access to any Extension organized groups. Further, The North Carolina Agricultural Research Service (NCARS) is committed to seeking, receiving and utilizing input from all stakeholder groups, including under-represented groups and the general public. A significant portion of the input from individuals throughout the state comes from interactions of research scientists with county-based Extension personnel and directly with producers, industry and other agribusiness personnel that represent both underserved audiences as well as more traditional audiences. Both Extension and Research personnel and organizations are intent on reaching all possible citizens where our discoveries and programs can have a positive impact on their quality of life and economic well-being.

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

The intent for all planned programs and research initiatives is to provide knowledge discovery and dissemination to the state's and nation's citizens. The intent of this effort is to assure that such programs are effective in producing real impacts that do enhance the quality of life of our citizens, their environment, and economic well being. Evaluations are made by administrators, policy makers, clients, funding organizations, and the public itself as to whether this intent is proven valid via actual results producing impacts. The continuous interaction with stakeholders assures that sufficient dialogue and communications are undertaken to produce the needed inputs regarding efficacy of programs and their impacts. Program and personnel evaluations as well as rewards are primarily focused on the efficacy of Research and Extension efforts in producing such desired results and impacts. The intensity of this effort shall continue to grow as even greater emphasis is placed on producing relevant impacts that are of value to society and our population.

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

There is a continuous focus by Research and Extension to maintain relevant programs to address the needs of North Carolina's and the nation's citizens. Internal studies and input from stakeholders and others who are actively involved in an established initiative to assure that program plans are current and relevant to the State's needs. By continuously planning and updating plans of work, as well to assure relevance and an ever increasing emphasis on program impacts and research results is assuring that more efficiencies and effectiveness of our programs produce tangible results. This is an ongoing emphasis that is fully expected to become more pronounced throughout the course of this plan of work and beyond.

IV. Stakeholder Input

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

- Use of media to announce public meetings and listening sessions
- Targeted invitation to traditional stakeholder groups
- Targeted invitation to non-traditional stakeholder groups
- Targeted invitation to traditional stakeholder individuals
- Targeted invitation to non-traditional stakeholder individuals
- Targeted invitation to selected individuals from general public
- Survey of traditional stakeholder groups
- Survey of traditional stakeholder individuals
- Survey of selected individuals from the general public

Brief explanation.

Extension has an ongoing system of securing stakeholder input in program planning, implementation, and quality assessment has and continues to be a primary commitment for North Carolina Cooperative Extension. An Advisory Leadership System is functional in each of the 100 counties in North Carolina. The system includes an Advisory Council and many specialized committees. The Advisory Council represents geographic, cultural and economic

diversity within communities of the county. Its function is to provide overall programmatic review, conduct environmental scans and needs assessment for program direction. These persons represent the diversity of the respective county population to assure the inclusion of under-served populations. While the advisory council will meet quarterly, the specialized committees will meet at least annually to discuss accomplishments and needs still to be addressed. This system is monitored administratively to assure that stakeholders provide such program input and actions. At the state level, a Statewide Advisory Council provides programmatic inputs, review and guidance for the overall program functions of the North Carolina Cooperative Extension Service at N.C. State University. This group meets quarterly as well as for other special meetings to meet organizational review and input needs. This Council is made up of influential individuals who represent a broad scope of the diverse population in North Carolina and who have distinguished themselves as respected and responsible knowledgeable leaders who can provide local perspectives into a statewide organization. In addition to being an integral part of the overall State Advisory Council, the Extension Program at NC A&T SU is also guided by a cadre of citizens who make up the Strategic Planning Council. The Strategic Planning Council includes community leaders, agribusiness persons, representatives from non-governmental organizations, representatives from State Advisory Council, representatives from county based specialized committees and elected officials. The Strategic Planning Council meets three times a year as a group. Networking and collaboration between the State Advisory Council and the Strategic Planning Council is facilitated by two members who serve on both Councils. Members of each Council periodically meet jointly. With these organized groups functioning as a planned emphasis on significant stakeholder input into program direction, a planned and proactive process is operational that assures that programs are reviewed and overall needs assessed on a continuous basis, but no less than once every two years, with greater frequency encouraged. However, with the functioning of the respective advisory groups on a much more frequent basis, stakeholder inputs are producing a continuous process of program review and adjustments as local needs change. An environmental scanning process is implemented in each of the state's 100 counties. This scanning process helps to assure that a large amount of input is gained from the citizens whom the research and extension efforts are intended to serve.

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

1. Method to identify individuals and groups

- Use Advisory Committees
- Use Internal Focus Groups
- Use External Focus Groups
- Open Listening Sessions
- Needs Assessments

Brief explanation.

Extension benefits from the input of a well-established statewide system of lay advisers representing the state's diverse population. Also, each county routinely conducts an environmental scan to determine emerging needs and appropriate education responses. These scans give residents, advisers, commodity group representatives, volunteers and other clients the opportunity to ensure that local programs meet local needs and priorities.

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

1. Methods for collecting Stakeholder Input

- Meeting with traditional Stakeholder groups
- Survey of traditional Stakeholder groups
- Meeting with traditional Stakeholder individuals
- Survey of traditional Stakeholder individuals
- Meeting specifically with non-traditional groups
- Meeting specifically with non-traditional individuals
- Meeting with invited selected individuals from the general public

Brief explanation.

This broad variety of collecting stakeholder input led to more than 22,000 citizens of North Carolina involvement in a needs assessment and the development of a new statewide plan of work for Cooperative Extension. As indicated, Research has extensive efforts to gain stakeholder input as well.

3. A statement of how the input will be considered

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

Brief explanation.

Commodity Association members and representatives, County Commissioners, State Legislators, and many other leaders and policy makers have varying influence and interactions regarding program direction, issues identification, budgets and their priorities, staffing and developing plans of actions. This is a huge on-going function that is ingrained in the program planning and implementation for both Research and Extension in North Carolina. It is our intent to involve and serve the citizens of this state in the most effective ways possible to enhance the quality of their lives and economic well-being.

V. Planned Program Table of Content

S. No.	PROGRAM NAME
1	Plant Production Systems and Health
2	Economic Systems
3	Natural Resources and Environment
4	Animals and Their Systems, Production and Health
5	Agricultural, Natural Resource, and Biological Engineering
6	Food Production Systems: Development, Processing, Quality, and Safety
7	Human Nutrition and Health
8	Families and Communities
9	Youth Development
10	Global Food Security and Hunger
11	Climate Change
12	Sustainable Energy
13	Childhood Obesity
14	Food Safety

V(A). Planned Program (Summary)**Program # 1****1. Name of the Planned Program**

Plant Production Systems and Health

2. Brief summary about Planned Program

North Carolina's agricultural economy has become more diverse to meet the demands of a changing population and market opportunities. Over 80 crops with an annual market value of nearly \$3 billion are produced commercially. Growers have diversified into many specialty crops including medicinal herbs, specialty melons, heirloom fruits and vegetables, various crops for the state's growing Hispanic and Oriental populations, kenaf, sea oats and wine grapes as well as organic production of various fruits and vegetables. This diversification has placed demands on the NCARS to develop sustainable programs for producing, protecting, harvesting, storing, and marketing these commodities, as well as Cooperative Extension to assure that appropriate audiences are adequately educated to use the latest developments. This planned program goal focus on research and extension programs that address needs of North Carolina growers which will allow them to remain competitive in a national and global agricultural economy and take advantage of local marketing opportunities through more efficient production practices and diversification to alternative and specialty crops. Research will focus on innovation in row crop production strategies and systems especially those used for biofuels; identification, selection, breeding, introgression and genomics designed to develop improved varieties with superior disease resistance and quality and varieties with the ability to produce high value constituents; structural, systems and quantitative biology using the tools of metabolomics and bioinformatics; value added agricultural and biological systems; horticultural and green industry production systems; and novel ways to manage pests in integrated systems. As a result of the changes in North Carolina agriculture there are an expanding number of new or inexperienced producers which creates increased education needs and opportunities for production and marketing information. Many of the projects within this program area fully integrate research and extension activities to develop and deliver educational programs to full-time, and limited-resource farmers, to agribusiness, and to the nonfarm public. Scientists in other discovery-oriented projects work in conjunction with field faculty to bring new knowledge and technology to producers and agribusinesses through development, field testing and demonstration.

3. Program existence : Intermediate (One to five years)**4. Program duration :** Long-Term (More than five years)**5. Expending formula funds or state-matching funds :** Yes**6. Expending other than formula funds or state-matching funds :** Yes

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
201	Plant Genome, Genetics, and Genetic Mechanisms	10%	10%	10%	
202	Plant Genetic Resources	10%	10%	10%	
204	Plant Product Quality and Utility (Preharvest)	5%	5%	5%	
205	Plant Management Systems	20%	20%	20%	
206	Basic Plant Biology	10%	10%	10%	
211	Insects, Mites, and Other Arthropods Affecting Plants	10%	10%	10%	
212	Pathogens and Nematodes Affecting Plants	15%	15%	15%	
213	Weeds Affecting Plants	15%	15%	15%	
216	Integrated Pest Management Systems	5%	5%	5%	
	Total	100%	100%	100%	

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

Although North Carolina has a strong agricultural economy in order to remain competitive nationally and globally, it is necessary for producers to become more efficient in the production of traditional crops and those used in the production of biofuels and diversify their operations to incorporate alternative and specialty crops in their mix. In recent years low grain prices and pressures exerted on tobacco production have resulted in the redirection of programs to explore and examine diversification of crop production in North Carolina with alternative and specialty crops. These crops range from those that have nutraceutical and/or pharmaceutical value to crops that have potential for use as biofuels to those for ethnic markets. Each provides great opportunities as well as challenges. Additionally, economic downturns in agronomic crops other than tobacco and sensitivity to environmental concerns regarding pesticides, nutrients and agricultural wastes have increased the need for more sustainable production practices for large as well as limited resource farmers. Furthermore, consumers have become more educated and food safety, quality, and nutrition are concerns of many people. It is therefore incumbent upon our producers to supply a quality, nutritious and safe product to the market place. In order to develop competitive and sustainable agricultural systems we must explore and develop new technologies that can be used by all members of the farming community. It is also essential that we use the powers of genomics, proteomics, and metabolomics to better understand the mechanisms that underlie pest resistance, enhanced yield, drought tolerance, salt tolerance and other stresses in order to develop new varieties for traditional and specialty markets. Changes in agricultural production, changes in government policies and regulations, the increased use of genetically modified crops, and changes in demographics all challenge the NCARS and NCCE, which includes Extension educational programs supported at both NC A&T and NCSU to continue to develop and deliver educational programs to full-time, part-time and limited resource farmers, to agribusiness, and the non-farm public to ensure a productive agriculture that is competitive in the global economy and that can continue to contribute to the state's economy and the way of life of its citizens.

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

There will be continued funding at the state and federal level for applied research on sustainable production systems and basic research on the mechanisms that underlie crop productivity and pest resistance.

There will be continued funding and support for extension faculty and county faculty to deliver programs to producers and other clientele.

The agricultural economy will remain strong and provide a climate to support agricultural research and extension programs.

2. Ultimate goal(s) of this Program

The ultimate goal of this program is to develop sustainable production systems for traditional as well as new crops that will ensure a healthy and viable agricultural economy and rural environment for all segments of the farming community. The realization of this goal will be predicated on basic research that will expand our knowledge on the mechanisms that underlie plant productivity and develop new technologies and applied research that will incorporate the findings of this research into sustainable production systems farmers in North Carolina.

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
2011	102.0	9.0	170.0	0.0
2012	102.0	9.0	170.0	0.0
2013	102.0	9.0	170.0	0.0
2014	102.0	9.0	170.0	0.0
2015	102.0	9.0	170.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

Conduct discovery research on plants and plant systems using tools genomics, metabolomics, and proteomics

Develop improved crop varieties using traditional and genomic approaches

Introduce/discover new plants for food use and the green industry

Develop systems for production of plants for biofuels

Seek new uses for plants and plant byproducts

Develop production systems for organic farmers

Develop diagnostic techniques for indigenous and introduced pathogens

Partner with industry

Develop sustainable production systems for both large scale and limited resource farmers

Enhance IPM programs through new techniques and strategies

Set up applied research/demonstration plots

Write papers for scientific community

Prepare publications for grower and homeowner audiences

Develop web sites to deliver information to grower and homeowner audiences

Conduct workshops, meetings, and other focused educational programs for farmers, commodity groups, and industry.

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

Extension

Direct Methods	Indirect Methods
<ul style="list-style-type: none"> ● Education Class ● Workshop ● Group Discussion ● One-on-One Intervention ● Demonstrations ● Other 1 (Tours) ● Other 2 (Conferences) 	<ul style="list-style-type: none"> ● Newsletters ● TV Media Programs ● Web sites ● Other 1 (Newsletters) ● Other 2 (Fact sheets)

3. Description of targeted audience

- The scientific community
- Regulatory agencies
- Agricultural chemical companies
- Agribusiness
- Commercial and limited resource farmers
- New and Part-time farmers
- Homeowners
- Consultants
- News media
- General public
- Non-governmental organizations
- Other public agency staff

V(G). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons(contacts) to be reached through direct and indirect contact methods

	Direct Contact Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
2011	352000	1200000	22900	23500
2012	352000	1200000	22950	23600
2013	352000	1200000	23000	23600
2014	352000	1200000	23000	23600
2015	352000	1200000	23000	23600

2. (Standard Research Target) Number of Patent Applications Submitted

2011:8 2012:8 2013:8 2014:8 2015:12

3. Expected Peer Review Publications

Year	Research Target	Extension Target	Total
2011	343	110	453
2012	347	110	457
2013	348	110	458
2014	350	110	460
2015	340	110	450

V(H). State Defined Outputs

1. Output Target

- Studies conducted to identify new germplasm and develop new and improved varieties of crops and ornamentals
2011:30 **2012:30** **2013:30** **2014:30** **2015:30**
- Clients to receive plant information via printed publications, fax, e-mails, phone and other contacts via known non-face to face delivery means.
2011:372000 **2012:373000** **2013:373000** **2014:373000** **2015:373000**
- Educate growers and other clientele through highly focused non-degree credit workshops and other formalized group educational sessions.
2011:1500 **2012:1500** **2013:1500** **2014:1500** **2015:1500**

V(I). State Defined Outcome

O. No.	Outcome Name
1	Increased Income as a Result of Production of New or Alternative Crops/Enterprises
2	Increased profit through the adoption of improved nutrient management practices
3	Number of releases of germplasm and varieties with improved yield potential and other qualities
4	New techniques and products developed and released that can be commercialized
5	Increased profit through the adoption of new production practices
6	More informed growers through highly focused non-degree credit workshops and other formalized group educational sessions.
7	Increased acreage of organic crops and specialty crops.
8	Number of discoveries of mechanisms that regulate the productivity of plants and the microorganisms that interact with them
9	Increased profit through the adoption of new production practices *and marketing locally*

Outcome # 1

1. Outcome Target

Increased Income as a Result of Production of New or Alternative Crops/Enterprises

2. Outcome Type : Change in Knowledge Outcome Measure

2011:1050000 **2012:**1060000 **2013:**1060000 **2014:**1060000 **2015:**1070000

3. Associated Knowledge Area(s)

- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Pathogens and Nematodes Affecting Plants
- 213 - Weeds Affecting Plants
- 216 - Integrated Pest Management Systems

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension

Outcome # 2

1. Outcome Target

Increased profit through the adoption of improved nutrient management practices

2. Outcome Type : Change in Knowledge Outcome Measure

2011:3100000 **2012:**3100000 **2013:**3100000 **2014:**3100000 **2015:**3100000

3. Associated Knowledge Area(s)

- 202 - Plant Genetic Resources
- 205 - Plant Management Systems
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Pathogens and Nematodes Affecting Plants
- 213 - Weeds Affecting Plants

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension

Outcome # 3**1. Outcome Target**

Number of releases of germplasm and varieties with improved yield potential and other qualities

2. Outcome Type : Change in Condition Outcome Measure

2011:27 **2012:28** **2013:28** **2014:28** **2015:30**

3. Associated Knowledge Area(s)

- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 202 - Plant Genetic Resources
- 206 - Basic Plant Biology
- 212 - Pathogens and Nematodes Affecting Plants

4. Associated Institute Type(s)

- 1862 Research

Outcome # 4**1. Outcome Target**

New techniques and products developed and released that can be commercialized

2. Outcome Type : Change in Condition Outcome Measure

2011:10 **2012:10** **2013:10** **2014:10** **2015:10**

3. Associated Knowledge Area(s)

- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 202 - Plant Genetic Resources
- 204 - Plant Product Quality and Utility (Preharvest)
- 206 - Basic Plant Biology
- 212 - Pathogens and Nematodes Affecting Plants

4. Associated Institute Type(s)

- 1862 Research

Outcome # 5**1. Outcome Target**

Increased profit through the adoption of new production practices

2. Outcome Type : Change in Action Outcome Measure

2011:33000000 **2012:33000000** **2013:33000000** **2014:33000000** **2015:33000000**

3. Associated Knowledge Area(s)

- 204 - Plant Product Quality and Utility (Preharvest)

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

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension

Outcome # 6

1. Outcome Target

More informed growers through highly focused non-degree credit workshops and other formalized group educational sessions.

2. Outcome Type : Change in Knowledge Outcome Measure

2011:75000 2012:76000 2013:76000 2014:76000 2015:80000

3. Associated Knowledge Area(s)

- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Pathogens and Nematodes Affecting Plants
- 213 - Weeds Affecting Plants
- 216 - Integrated Pest Management Systems

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

Outcome # 7

1. Outcome Target

Increased acreage of organic crops and specialty crops.

2. Outcome Type : Change in Action Outcome Measure

2011:2000 2012:2000 2013:2000 2014:2000 2015:2500

3. Associated Knowledge Area(s)

- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 213 - Weeds Affecting Plants

- 216 - Integrated Pest Management Systems

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

Outcome # 8

1. Outcome Target

Number of discoveries of mechanisms that regulate the productivity of plants and the microorganisms that interact with them

2. Outcome Type : Change in Action Outcome Measure

2011:26	2012:26	2013:26	2014:26	2015:30
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3. Associated Knowledge Area(s)

- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 202 - Plant Genetic Resources
- 204 - Plant Product Quality and Utility (Preharvest)
- 206 - Basic Plant Biology
- 212 - Pathogens and Nematodes Affecting Plants

4. Associated Institute Type(s)

- 1862 Research

Outcome # 9

1. Outcome Target

Increased profit through the adoption of new production practices *and marketing locally*

2. Outcome Type : Change in Knowledge Outcome Measure

2011:0	2012:0	2013:0	2014:0	2015:15
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3. Associated Knowledge Area(s)

- 205 - Plant Management Systems

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes

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

Description

Changes in both competitive and noncompetitive funding will greatly influence our ability to conduct the planned research as well as deliver the results to our stakeholders. Similarly changes in policy and government regulations that affect the regulation of transgenic plants, environmental regulations, and pesticide registrations can greatly influence the direction of the research programs. The introduction of an exotic pest could greatly influence the direction of research programs. Field research could be significantly impacted by natural disasters such as hurricanes.

V(K). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- After Only (post program)
- Retrospective (post program)
- Before-After (before and after program)
- During (during program)

Description

Some research studies and extension activities have formal evaluation protocols to establish base-line data. An example would be IPM programs where an initial assessment of pesticide use is necessary to determine the impact of the program. Similar, baseline studies on pest resistance to pesticides are necessary to determine if resistance management techniques are effective in preventing the development of resistance. The success of research programs is measured by peer reviewed publications. Measures such as the Science Citation Index are used to assess the impact of these publications.

2. Data Collection Methods

- Sampling
- Mail
- Telephone
- On-Site
- Structured
- Unstructured
- Observation

Description

Methods of data collection will vary among the individual research projects within this Planned Program. Extension activities use various measures including (i) meetings with traditional Stakeholder groups, (ii) surveys of traditional Stakeholder groups, (iii) meetings with traditional Stakeholder individuals, (iv) surveys of traditional Stakeholder individuals, (v) meetings specifically with non-traditional groups, (vi) meetings specifically with non-traditional individuals and (vii) meetings with invited selected individuals from the general public.

V(A). Planned Program (Summary)**Program # 2****1. Name of the Planned Program**

Economic Systems

2. Brief summary about Planned Program

The diverse population of North Carolina faces many economic and social challenges over the next five years. There is a great need for North Carolina citizens to better understand global economic issues as well as acquire basic knowledge about how global economic forces interact with the local economy to enhance local economic prospects. Understanding the behavior of individual decision makers is perhaps the most basic endeavor of economics. Economic system issues often involve decision makers trying to better understand production relationships, examining constraints due to limited resource availability, interpret policy restrictions, investigate and analyze prices and marketing opportunities, assess management decisions, explore alternative agricultural and environmental programs impacts, and evaluate advantages and disadvantages of new technology. It is likely that the population of North Carolina will continue to increase rapidly as additional groups recognize that North Carolina is an attractive place to live and work. Large scale in-migration is expected to fuel dramatic economic growth in many service sectors, particularly for retirement age and Latino households. Community leaders expect to preserve the high quality of the local natural environment while also providing needed services. Rural citizens will request advanced training on creating new business opportunities. Traditional clients will continue to request assistance in evaluation of more traditional agricultural and agribusiness technology. Thus, there will be an increase in the number and variety of larger scale businesses as well as an expansion in the number of home-based, smaller scale firms starting up in the state. Both segments seek to increase business and technical skills to result in an improved financial position for their household. As a result, many small and large businesses will request assistance in learning sound money management skills. Research and outreach efforts are needed to assist people in implementing programs that promote sustainable economic development, responsible management of financial assets, and make families more secure financially. Economic system analysis depends critically on an individual decision maker's response to incentives, programs, and the economic environment. Agricultural production remains an important source of farm income throughout North Carolina so programs designed to assist farmers and ranchers create added value will be important. Discontinuation of many traditional farm programs (peanuts and tobacco) have created economic income uncertainty for many rural families. We must enhance a community's capability and skills to reinvigorate its economic development opportunities.

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

4. Program duration : Medium Term (One to five years)

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

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

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
601	Economics of Agricultural Production and Farm Management	30%	30%	30%	
602	Business Management, Finance, and Taxation	25%	25%	25%	
604	Marketing and Distribution Practices	5%	5%	5%	
605	Natural Resource and Environmental Economics	25%	25%	25%	
607	Consumer Economics	15%	15%	15%	
	Total	100%	100%	100%	

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

Agricultural producers must continue to adopt new and improved farm management and marketing practices to ensure long-term economic viability. Research and Extension activities can help bridge the gap between the needs of suppliers and the wants of consumers. Today, in excess of 70% of the each consumer's food dollar is spent on marketing activities. To survive, a small business must be well managed, market effectively, and adapt quickly to a changing production environment. Of concern to farmers, handlers, and consumers are fundamental issues such as "How well does the current production and marketing system serve the individual participant?" Alternatively stated, the question could be examined from the perspective of how efficient is the current food production and marketing system? Economic efficiency exists often measured in terms of both pricing and technical expertise. Can additional value added opportunities be created by improving the competitive position of North Carolina agriculture? Farm and rural area resources differ by family, by area, and by family goals and objectives. Research and Extension efforts will focus on economic feasibility of producing and marketing a mix of value added commodities offered by local suppliers. As alternative agricultural income opportunities are examined, an expanding number of inexperienced growers and first-handlers will require additional research and outreach educational emphasis.

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 money and resources will continue to be available at current or expanded dollar levels. It is assumed that research and extension priorities will not change dramatically over the next five years. We assume a personnel will be available to conduct specific research and extension activities. We assume that producers, handlers, and consumers will provide information that allows us to conduct behavioral analysis.

2. Ultimate goal(s) of this Program

We want to integrate economic and production decision-making to ensure that limited resources are managed wisely and economic value is generated. In effect, we want to maximize consumer-to-producer signals to ensure that producers provide items for consumers at the right price, time, place, and form. Through our Research and Extension efforts, we will strive to provide economic decision support for sustainable agricultural commodities and products that include changing technologies, alternative systems, risk aversion, public policy, rural communities and labor markets.

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
2011	14.0	9.0	10.0	0.0
2012	14.0	9.0	10.0	0.0
2013	14.0	9.0	10.0	0.0
2014	14.0	9.0	10.0	0.0
2015	14.0	9.0	10.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

We plan to conduct a multiplicity of educational programs and utilize applied research projects to enhance the knowledge base of targeted citizens in North Carolina and other designated areas. This will involve conducting programs that organize farm management schools, conduct meetings on topics such as risk management, net profit calculations, tax preparer schools, and conduct feasibility studies that examine the economics of alternative and traditional enterprises. We will conduct Research projects and Extension programs that provide economic decision support for sustainable agricultural commodities and products that feature changing and new technologies, evaluation of alternative incentive-based systems, risk aversion, public policy, rural communities and labor markets.

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

Extension

Direct Methods	Indirect Methods
<ul style="list-style-type: none"> ● Education Class ● Workshop ● Group Discussion ● One-on-One Intervention ● Other 1 (Conferences) 	<ul style="list-style-type: none"> ● Public Service Announcement ● Newsletters ● TV Media Programs ● Web sites

3. Description of targeted audience

Agribusiness personnel, tax preparers, financial advisers, limited resource farmers (active, new and potential), farm managers, rural appraisers, supply chain operators, county agents, colleagues, state department of agriculture specialists, and commodity association board members.

V(G). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons(contacts) to be reached through direct and indirect contact methods

	Direct Contact Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
2011	4000	9500	1700	4000
2012	4000	9500	1700	4050
2013	4000	9700	1760	4100
2014	4000	9700	1800	4100
2015	4000	9700	1900	4300

2. (Standard Research Target) Number of Patent Applications Submitted

2011:0 2012:0 2013:0 2014:0 2015:0

3. Expected Peer Review Publications

Year	Research Target	Extension Target	Total
2011	52	30	82
2012	52	30	82
2013	52	30	82
2014	52	30	82
2015	53	32	85

V(H). State Defined Outputs

1. Output Target

- Number of Non-degree credit activities conducted focusing on markets, farm and business management

2011:55	2012:55	2013:55	2014:55	2015:55
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- Number of county and area tax preparer schools

2011:25	2012:25	2013:26	2014:26	2015:28
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- Registered attendees at estate planning, legal advice, and financial management schools

2011:500	2012:500	2013:500	2014:500	2015:550
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- Enrollees for the Natural Resource Leadership Institute year-long training

2011:16	2012:16	2013:16	2014:16	2015:10
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- Integrated Research Projects Conducted

2011:9	2012:9	2013:9	2014:9	2015:10
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V(I). State Defined Outcome

O. No.	Outcome Name
1	Tax preparers gain needed knowledge for return preparation by attending workshops conducted throughout North Carolina.
2	New organic, farmers, and agritourism markets established by individual entrepreneurs
3	Growers Adopting Improved Business Management Practices

Outcome # 1

1. Outcome Target

Tax preparers gain needed knowledge for return preparation by attending workshops conducted throughout North Carolina.

2. Outcome Type : Change in Knowledge Outcome Measure

2011:1200 2012:1200 2013:1350 2014:1350 2015:1400

3. Associated Knowledge Area(s)

- 601 - Economics of Agricultural Production and Farm Management
- 602 - Business Management, Finance, and Taxation
- 607 - Consumer Economics

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 2

1. Outcome Target

New organic, farmers, and agritourism markets established by individual entrepreneurs

2. Outcome Type : Change in Action Outcome Measure

2011:30 2012:30 2013:30 2014:30 2015:30

3. Associated Knowledge Area(s)

- 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

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension

Outcome # 3

1. Outcome Target

Growers Adopting Improved Business Management Practices

2. Outcome Type : Change in Knowledge Outcome Measure

2011:3100

2012:3125

2013:3125

2014:3200

2015:3250

3. Associated Knowledge Area(s)

- 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

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension

V(J). Planned Program (External Factors)**1. External Factors which may affect Outcomes**

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

Description

The economy and any changes in program funding can have a significant impact on adoption or non-adoption of new innovations, BMPs and other management changes in agricultural operations. The new farm bill dictates public policy and recently enacted regulations will dictate, to a large degree, topics that are of most concern or interest to agricultural producers. Financial incentives and profitability potential will determine, to a large extent, adoption of new or existing technologies or producers bypassing any innovations that are not of interest to producers. Limited funding can result in significant impediments to being able to conduct the necessary economic and risk assessment to allow for latest informed decision making support for growers and others. Also, demographic changes can be expected to impact the availability of new or innovative marketing opportunities. We will work with county extension agents to advise them about how financial criteria can impact technology adoption. For example, construction and operation of a new fruit or vegetable freezing plant would expand marketing opportunities for low cost growers. However, opportunities would not exist for limited volume, technology-challenged producers who wish to supply frozen fruits and vegetables.

V(K). Planned Program (Evaluation Studies and Data Collection)**1. Evaluation Studies Planned**

- After Only (post program)
- Retrospective (post program)
- Before-After (before and after program)
- During (during program)
- Case Study

- Comparisons between program participants (individuals, group, organizations) and non-participants
- Comparisons between different groups of individuals or program participants experiencing different levels of program intensity.
- Comparison between locales where the program operates and sites without program intervention

Description

Evaluation monitoring and reporting is a basic component of most funded projects. Evaluation reports and studies occur in SARE, RMA and other funded projects.

2. Data Collection Methods

- Sampling
- Whole population
- On-Site
- Structured
- Unstructured
- Case Study
- Observation
- Tests

Description

Evaluation of program effectiveness is tracked in the Extension Learning Management System and Extension Reporting System. In the ERS, agents report success stories and program impacts.

V(A). Planned Program (Summary)**Program # 3****1. Name of the Planned Program**

Natural Resources and Environment

2. Brief summary about Planned Program

Research and Extension will enhance cooperative and collaborative efforts to protect the environment and preserve natural resources while promoting a strong and diverse agriculture. Mandates from state government to reduce odor and eliminate the use of lagoon/sprayfield waste treatment systems in confined animal operations are having a significant impact on the direction and urgency of research and outreach efforts in the environmental area. Activities associated with this program are aimed at enhancing our understanding of the physical, biological and chemical processes and interactions influencing agricultural ecosystem impacts. Interdisciplinary projects will advance knowledge of natural processes to enable development of production management and environmental protection technologies and strategies that will increase productivity; improve input efficiency; conserve natural resources; and improve and protect environmental quality. Increasing emphasis is being placed on air quality management and improvement, particularly as it relates to animal production systems.

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

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

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

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

V(B). Program Knowledge Area(s)**1. Program Knowledge Areas and Percentage**

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
102	Soil, Plant, Water, Nutrient Relationships	30%	30%	30%	
111	Conservation and Efficient Use of Water	10%	10%	10%	
112	Watershed Protection and Management	15%	15%	15%	
133	Pollution Prevention and Mitigation	30%	30%	30%	
141	Air Resource Protection and Management	15%	15%	15%	
	Total	100%	100%	100%	

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

North Carolina is a state of diverse and remarkable physical and natural resources. A strong agriculture is critical to the economy of the state. At the same time, the preservation of the environment and the health of our citizens is of paramount concern. Thus, research and outreach efforts that address these goals will have high priority. The Cooperative Extension Program at NC A&T State University assumes responsibility to provide watershed sustainability programs for small scale farmers, urban households and limited resource audiences particularly those with low literacy skills.

2. Scope of the Program

- In-State Extension

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

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

1. Assumptions made for the Program

Funding will be made available for these high priority programs and efforts will be expanded. People with low literacy skills generally lack a basic understanding of how human activities from both agricultural and urban environments influence water resources.

2. Ultimate goal(s) of this Program

To improve agricultural productivity while also improving environmental quality and natural resource utilization. To engage minority and culturally diverse audiences in decision-making and land use policy communications to overcome environmental injustices

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
2011	46.0	2.0	22.0	0.0
2012	46.0	2.0	22.0	0.0
2013	46.0	2.0	22.0	0.0
2014	46.0	2.0	22.0	0.0
2015	45.0	2.0	22.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

Research activities will be focused on understanding the processes and situations that create pollution problems from agricultural production (including animal operations, field activities, and processing). With that information in hand, improved management and technological solutions will be proposed and evaluated. Technology transfer will be accomplished through demonstrations, workshops, and publications by Cooperative Extension in concert with the researchers involved.

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

Extension

Direct Methods	Indirect Methods
<ul style="list-style-type: none"> • Education Class • Workshop • One-on-One Intervention • Demonstrations • Other 1 (Conferences) 	<ul style="list-style-type: none"> • Newsletters • Web sites

3. Description of targeted audience

Agricultural producers, environmental and other governmental agencies (action and regulatory), news media, the general public.

V(G). Planned Program (Outputs)**1. Standard output measures**

Target for the number of persons(contacts) to be reached through direct and indirect contact methods

	Direct Contact Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
2011	74000	161000	15300	20000
2012	74000	161000	15400	20000
2013	74000	161000	15400	20000
2014	74000	161000	15400	20000
2015	74000	165000	15500	21000

2. (Standard Research Target) Number of Patent Applications Submitted**2011:1****2012:1****2013:1****2014:1****2015:2****3. Expected Peer Review Publications**

Year	Research Target	Extension Target	Total
2011	26	7	33
2012	27	7	34
2013	27	7	34
2014	27	7	34
2015	30	8	38

V(H). State Defined Outputs

1. Output Target

- Waste Management Certification Programs

2011:40

2012:40

2013:40

2014:40

2015:40

- Number of Research Projects Completed on Environmental/Natural Resource Issues

2011:5

2012:5

2013:6

2014:6

2015:8

- Number of non-degree credit environmental activities conducted

2011:760

2012:770

2013:775

2014:780

2015:750

V(I). State Defined Outcome

O. No.	Outcome Name
1	Number farms first utilizing precision application technologies
2	Number of farms implementing additional best management practices for animal waste management
3	Number of urban households/small farms with low-literacy individuals implementing and/or adopting best management practices to enhance water quality.
4	Number of Waste Management Certifications Gained or Maintained
5	Number of acres where proper waste analysis was used for proper land application

Outcome # 1

1. Outcome Target

Number farms first utilizing precision application technologies

2. Outcome Type : Change in Action Outcome Measure

2011:650 2012:660 2013:660 2014:670 2015:650

3. Associated Knowledge Area(s)

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

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension

Outcome # 2

1. Outcome Target

Number of farms implementing additional best management practices for animal waste management

2. Outcome Type : Change in Knowledge Outcome Measure

2011:1500 2012:1500 2013:1500 2014:1500 2015:1600

3. Associated Knowledge Area(s)

- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 133 - Pollution Prevention and Mitigation
- 141 - Air Resource Protection and Management

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 3

1. Outcome Target

Number of urban households/small farms with low-literacy individuals implementing and/or adopting best management practices to enhance water quality.

2. Outcome Type : Change in Action Outcome Measure

2011:55 2012:56 2013:56 2014:56 2015:65

3. Associated Knowledge Area(s)

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

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 4

1. Outcome Target

Number of Waste Management Certifications Gained or Maintained

2. Outcome Type : Change in Knowledge Outcome Measure

2011:3000 2012:3000 2013:3000 2014:3000 2015:3100

3. Associated Knowledge Area(s)

- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 133 - Pollution Prevention and Mitigation
- 141 - Air Resource Protection and Management

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension

Outcome # 5

1. Outcome Target

Number of acres where proper waste analysis was used for proper land application

2. Outcome Type : Change in Action Outcome Measure

2011:800000 2012:850000 2013:850000 2014:850000 2015:835000

3. Associated Knowledge Area(s)

- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water

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

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

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

Description

Weather-related issues can and will have a major impact on environmental research and outreach projects. The economy and any changes in program funding can also have a significant impact on adoption or non-adoption of BMPs and other management changes in agricultural operations. Public policy and regulations will dictate, to a very large degree, the topics that are of most concern or interest to the agricultural producers, which will determine the kinds of projects and programs that are of interest to those producers. Limited funding will create significant impediments in a number of these research/outreach areas, since most of these areas require time consuming and expensive data collection efforts.

V(K). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- After Only (post program)
- Before-After (before and after program)
- During (during program)
- Time series (multiple points before and after program)
- Comparisons between program participants (individuals, group, organizations) and non-participants

Description

Some studies will attempt to quantify the "before study" baseline and then determine the change caused by the implementation of specific practices, structures, etc. Other studies will attempt to quantify the rate of change during the program. In some cases, participants will be compared with non-participants (to the extent possible).

2. Data Collection Methods

- Sampling
- Whole population
- On-Site
- Observation

Description

Most of the environmental or natural resource projects will require relatively long-term, sophisticated data collection to determine the changes that occur due to specific changes in management or facility configuration. Some of the data collection will be observational, but much will be accomplished using data logging systems with mixtures of simple and complex sensing systems.

V(A). Planned Program (Summary)**Program # 4****1. Name of the Planned Program**

Animals and Their Systems, Production and Health

2. Brief summary about Planned Program

In order to maintain and improve the efficiency and productivity of North Carolina and the nation's animal agriculture farmers and producers, a broad and effective plan of work has been developed. This work includes research and outreach through Cooperative Extension that includes NCA&T and NCState Universities, and engages many clientele groups including producers, agribusiness personnel and the general public. The plan of work addresses all the animal commodity groups important to North Carolina and will use any discipline necessary to address the issues of concern. New technology and knowledge will be disseminated to clientele groups both directly and indirectly through numerous methods. All participants and plans of work will be evaluated at least yearly to measure progress and success.

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

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

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

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

V(B). Program Knowledge Area(s)**1. Program Knowledge Areas and Percentage**

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
301	Reproductive Performance of Animals	20%	20%	20%	
302	Nutrient Utilization in Animals	20%	20%	20%	
303	Genetic Improvement of Animals	17%	17%	17%	
307	Animal Management Systems	18%	18%	18%	
311	Animal Diseases	10%	10%	10%	
312	External Parasites and Pests of Animals	5%	5%	5%	
313	Internal Parasites in Animals	5%	5%	5%	
315	Animal Welfare/Well-Being and Protection	5%	5%	5%	
	Total	100%	100%	100%	

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

In today's world market, North Carolina farmers and animal producers must utilize cutting edge technology to remain the most efficient producers of wholesome and healthy food while maintaining or improving animal health and well being while also providing proper environmental stewardship for our land, water, and air resources. Over the next five years, this plan of work will involve a broad scope of players and participants including, but not necessarily limited to, NCSU and NCA&T faculty and staff, North Carolina Cooperative Extension Service personnel, farmers, agribusiness personnel, local and federal agency personnel, elected officials and the general public. Improving the efficiency of animal production will include improving reproductive performance, improvement in nutrient utilization, genetic improvement in growth and reproduction,

improvements in animal management systems, decreases in incidence of animal diseases and parasites and improved management of animal and agricultural pests. While many of these improvements will be accomplished in the research setting, ultimate success will be realized when these practices are adopted by farmers and agribusiness personnel through outreach efforts. Sharing of accomplishments with all stakeholders will ensure a smooth and successful transition of new information from researchers to applied and working technology for the farmers accompanied by trust from the general public.

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

Basic assumptions to accomplish this plan of work include current level of personnel and support, appropriate funding to accomplish research and outreach programs, success in accomplishing the basic or applied research; i.e. taking advantage of opportunities and finding solutions to problems, appropriate outreach programs to deliver information to stakeholders, acceptance and usage by stakeholders of the new technology or information, acceptance and trust of general public of new programs adopted by clientele.

2. Ultimate goal(s) of this Program

The ultimate goal of this plan of work is to continue the progress of making our animal systems sustainable in at least three ways; sustainable in productivity and efficiency for both the producer and the consumer, sustainable with respect to our natural resources, and sustainable in the continued acceptance and trust of agriculture by the general public.

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
2011	56.0	3.0	120.0	0.0
2012	56.0	3.0	120.0	0.0
2013	56.0	3.0	120.0	0.0
2014	56.0	3.0	120.0	0.0
2015	56.0	0.0	0.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

This plan of work includes broad and extensive research and extension programs. NC Agricultural Research Service scientists will conduct research projects to study methods to improve the efficiency of animal production. Research will focus on methods to improve reproductive performance, nutrient utilization, and genetic influence on growth and reproduction. Scientists will also work to improve animal management systems, decrease the incidence of animal diseases and parasites

(external and internal) and improve the management of animal and agricultural pests. Species and commodity groups included in this plan of work are also very broad and include poultry such as turkeys, broiler chickens, and table-egg chickens. The plan of work also includes swine, fish such as flounder, and cattle such as beef and dairy, and numerous pests such as house flies. Research will include many phases of commodity production such as meat and dairy goats, chicken breeders (both broiler and table egg birds), commercial broilers (commercial refers to those animals produced for meat), breeder turkeys, commercial turkeys, swine breeders, commercial swine, all phases of aquaculture and beef and dairy production. Disciplines that will be involved include nutrition, physiology, reproductive physiology, genetics, virology, bacteriology, microbiology, mycology, entomology, and many animal management systems such as grazing and forage management programs, hatchery management, feeding and drinking water systems, litter and bedding management, lighting programs, and breeder selection and management. A very important part of this plan of work is to transfer technology and knowledge to our stake-holders and clientele. Therefore, an extensive outreach effort through Cooperative Extension will be conducted by field and campus based faculty who are based on-site as well as being located across the state and based in local communities. Stake-holders and clientele will be directly engaged in many ways including workshops, conferences, discussion groups, one-on-one teaching, demonstrations, field days, short-courses, continuing education classes, and scientific meetings. Indirect methods to reach stake-holders and clientele will include long-distance education, newsletters, web sites, newspaper releases, television and radio programs, trade journals, scientific journals, and popular press articles. Participants and programs will be evaluated at least annually for success, progress, and effectiveness. Special educational programs focused on limited resource farmers will continue to be a priority for NC A&T focused Extension efforts in pasture based production systems, aquaculture and alternative breeds.

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

Extension

Direct Methods	Indirect Methods
<ul style="list-style-type: none"> ● Education Class ● Workshop ● One-on-One Intervention ● Demonstrations ● Other 1 (Scientific meetings) ● Other 2 (Shows) 	<ul style="list-style-type: none"> ● Newsletters ● TV Media Programs ● Web sites ● Other 1 (Conferences) ● Other 2 (Journals)

3. Description of targeted audience

The target audience will be primarily aquaculture, poultry, livestock producers, small-scale limited resource, beginning and underserved growers and agribusiness personnel in North Carolina. However, since North Carolina producers are some of the best in the world, ultimately, producers and agribusiness personnel across the country and around the world will be the primary audience. In addition, the audience will include personnel in other state and federal agencies, local, state and federal politicians, and other stakeholders including the general public.

V(G). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons(contacts) to be reached through direct and indirect contact methods

	Direct Contact Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
2011	160000	250000	47500	50000
2012	165000	250000	47500	50500
2013	165000	250000	47500	50500

	Direct Contact Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
2014	165000	250000	47500	50500
2015	163000	245000	48000	51000

2. (Standard Research Target) Number of Patent Applications Submitted

2011:3 2012:3 2013:3 2014:3 2015:4

3. Expected Peer Review Publications

Year	Research Target	Extension Target	Total
2011	148	58	206
2012	149	59	208
2013	150	60	210
2014	150	60	210
2015	152	60	212

V(H). State Defined Outputs

1. Output Target

- Highly focused non-degree credit group training activities to be conducted

2011:700 2012:700 2013:700 2014:700 2015:700

- Relevant and impacts focused research projects to be conducted

2011:62 2012:62 2013:62 2014:62 2015:65

- Local, Area, Regional, and State Conferences to be Conducted

2011:40 2012:40 2013:40 2014:40 2015:38

- Local, Area, Regional, and State Educational Tours to be Conducted

2011:14 2012:14 2013:14 2014:15 2015:13

V(I). State Defined Outcome

O. No.	Outcome Name
1	Additional income gained by animal producers improved planning, marketing, and financial practices
2	Net income increased by producers improving animal husbandry practices
3	Number of animal producers adopting improved animal husbandry practices
4	Number Livestock Producers Adopting and Applying Improved Planning and Financial Management Practices

Outcome # 1**1. Outcome Target**

Additional income gained by animal producers improved planning, marketing, and financial practices

2. Outcome Type : Change in Knowledge Outcome Measure

2011:7700000 2012:7700000 2013:7700000 2014:7700000 2015:7000000

3. Associated Knowledge Area(s)

- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 303 - Genetic Improvement of Animals
- 307 - Animal Management Systems
- 311 - Animal Diseases
- 312 - External Parasites and Pests of Animals
- 313 - Internal Parasites in Animals
- 315 - Animal Welfare/Well-Being and Protection

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension

Outcome # 2**1. Outcome Target**

Net income increased by producers improving animal husbandry practices

2. Outcome Type : Change in Action Outcome Measure

2011:8000000 2012:8000000 2013:8000000 2014:8000000 2015:7500000

3. Associated Knowledge Area(s)

- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 303 - Genetic Improvement of Animals
- 307 - Animal Management Systems
- 311 - Animal Diseases
- 312 - External Parasites and Pests of Animals
- 313 - Internal Parasites in Animals
- 315 - Animal Welfare/Well-Being and Protection

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension

Outcome # 3

1. Outcome Target

Number of animal producers adopting improved animal husbandry practices

2. Outcome Type : Change in Action Outcome Measure

2011:3900 2012:4000 2013:4000 2014:4000 2015:4100

3. Associated Knowledge Area(s)

- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 303 - Genetic Improvement of Animals
- 307 - Animal Management Systems
- 311 - Animal Diseases
- 312 - External Parasites and Pests of Animals
- 313 - Internal Parasites in Animals
- 315 - Animal Welfare/Well-Being and Protection

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension

Outcome # 4

1. Outcome Target

Number Livestock Producers Adopting and Applying Improved Planning and Financial Management Practices

2. Outcome Type : Change in Action Outcome Measure

2011:3000 2012:3000 2013:3000 2014:3000 2015:2800

3. Associated Knowledge Area(s)

- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 303 - Genetic Improvement of Animals
- 307 - Animal Management Systems
- 311 - Animal Diseases
- 312 - External Parasites and Pests of Animals

- 315 - Animal Welfare/Well-Being and Protection

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

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

Description

Anything that competes for public funding or that affects public policy can have an impact on this plan of work. There is a very great risk that most of the participants in this plan of work will have their funding, activities, or both re-directed if significant external factors occur. External factors such as appropriation changes or policy changes can affect funding available to support programs while factors such as public priorities and population changes can affect specific program activities. Severe external factors such as hurricanes can affect both funding and program activities for an extended period of time.

V(K). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- After Only (post program)
- Retrospective (post program)
- Before-After (before and after program)
- During (during program)
- Comparisons between program participants (individuals, group, organizations) and non-participants
- Comparisons between different groups of individuals or program participants experiencing different levels of program intensity.

Description

All participants and programs will be evaluated at least yearly to measure progress and success. Stakeholders and clientele will be surveyed periodically to determine continued importance of current programs and to ascertain the need for new or modified programs.

2. Data Collection Methods

- Sampling
- Whole population
- Mail
- Telephone

- On-Site
- Structured
- Unstructured
- Observation
- Tests

Description

Various methods of evaluation will be used depending on the specific project. Clientele and stakeholders will be surveyed individually or in group settings. Stakeholder input will be collected during meetings such as workshops and conferences.

V(A). Planned Program (Summary)**Program # 5****1. Name of the Planned Program**

Agricultural, Natural Resource, and Biological Engineering

2. Brief summary about Planned Program

Through research and Extension efforts, engineered solutions for food and fiber systems as well as non-food products and processes will be developed and brought to application in North Carolina. Research and Extension efforts in engineered systems will continue in the traditional agricultural areas, but recent state and national goals in environmental protection, energy recovery and conversion or use of agricultural products in conversion to fuels and other "added-value" products will spur efforts in these emerging areas. The overall program will span engineering applications from precision agriculture and sensors and controls to unit processes developed for biomass conversion and chemical extraction. Applied research and Extension efforts will continue to adapt to the changing waste management needs of the State both for agricultural and animal waste, and urban waste. Engineering will be used to mitigate pollution in watersheds through stream restoration designs. Issues in food safety will be addressed in part by engineered solutions.

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

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

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

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

V(B). Program Knowledge Area(s)**1. Program Knowledge Areas and Percentage**

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
133	Pollution Prevention and Mitigation	10%	10%	10%	
401	Structures, Facilities, and General Purpose Farm Supplies	5%	5%	5%	
402	Engineering Systems and Equipment	20%	20%	20%	
403	Waste Disposal, Recycling, and Reuse	15%	15%	15%	
404	Instrumentation and Control Systems	15%	15%	15%	
405	Drainage and Irrigation Systems and Facilities	5%	5%	5%	
503	Quality Maintenance in Storing and Marketing Food Products	10%	10%	10%	
511	New and Improved Non-Food Products and Processes	15%	15%	15%	
512	Quality Maintenance in Storing and Marketing Non-Food Products	5%	5%	5%	
	Total	100%	100%	100%	

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

Agricultural price supports and subsidies are declining in North Carolina. Both tobacco and peanut no longer receive a federally guaranteed price. This means that some traditional field crops and their production systems are yielding to new crops with different tillage, water management, and harvest needs in addition to different post-harvest storage and processing

requirements. Engineering solutions for animal waste management are still very much at the fore and will be for the foreseeable future. The emerging biotech industry and the search for alternative fuels will lead to an increased focus on bioprocess engineering. Food safety and security concerns have increased, and engineering will be part of the solution. Pollution prevention on a watershed scale is also a priority, and there is an increasing demand for natural designs of best management practices rather than traditional designs that are more structural in nature.

2. Scope of the Program

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

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

1. Assumptions made for the Program

Funding will be made available for this priority program and efforts will be expanded.

2. Ultimate goal(s) of this Program

To improve agricultural, waste management, and bioprocess engineered systems to address current and emerging needs.

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
2011	19.0	1.0	12.0	0.0
2012	19.0	1.0	12.0	0.0
2013	19.0	1.0	12.0	0.0
2014	19.0	1.0	12.0	0.0
2015	19.0	1.0	12.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

Research and Extension activities will focus on applying and adapting knowledge gained from basic research to agricultural production systems and natural resource pollution prevention. Both "soft" engineering (e.g. unit process engineering) and "hard engineering" (e.g., machines, hardware and sensors and controls) will be a part of the Research and Extension activity. Technology transfer will be achieved through workshops, demonstrations and field days, and publications.

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

Extension

Direct Methods	Indirect Methods
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<ul style="list-style-type: none"> ● Education Class ● Workshop ● One-on-One Intervention ● Demonstrations ● Other 1 (Tours) ● Other 2 (Conferences) 	<ul style="list-style-type: none"> ● Newsletters ● Web sites ● Other 1 (Publications)
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3. Description of targeted audience

The target audience will be: agricultural producers, manufacturers of agricultural machinery and food processing and storage equipment, state agencies, watershed stakeholders, and the general public.

V(G). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons(contacts) to be reached through direct and indirect contact methods

	Direct Contact Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
2011	13100	21700	2200	4600
2012	13500	21700	2200	4650
2013	13500	21700	2200	4650
2014	13500	21700	2200	4650
2015	14000	22000	2500	5000

2. (Standard Research Target) Number of Patent Applications Submitted

2011:2 2012:2 2013:2 2014:2 2015:3

3. Expected Peer Review Publications

Year	Research Target	Extension Target	Total
2011	30	12	0
2012	30	12	0
2013	30	12	0
2014	30	12	0
2015	32	10	42

V(H). State Defined Outputs

1. Output Target

- Number of Research Projects Completed in Agricultural, Biological and Natural Resource Engineering

2011:30

2012:30

2013:30

2014:30

2015:35

- Number of Workshops and Trainings Completed in Agricultural, Biological and Natural Resource Engineering

2011:60

2012:60

2013:60

2014:60

2015:62

- Relevant Non-degree credit group activities completed

2011:35

2012:36

2013:36

2014:36

2015:32

V(I). State Defined Outcome

O. No.	Outcome Name
1	Number of growers implementing stream protection practices e.g. buffers, fencing, etc.
2	Number of stormwater systems installing BMPs
3	Number of farms adopting use of biofuels
4	Number of growers implementing improved irrigation and drainage systems

Outcome # 1

1. Outcome Target

Number of growers implementing stream protection practices e.g. buffers, fencing, etc.

2. Outcome Type : Change in Knowledge Outcome Measure

2011:300	2012:300	2013:300	2014:300	2015:280
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3. Associated Knowledge Area(s)

- 133 - Pollution Prevention and Mitigation
- 402 - Engineering Systems and Equipment
- 403 - Waste Disposal, Recycling, and Reuse
- 404 - Instrumentation and Control Systems
- 405 - Drainage and Irrigation Systems and Facilities

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension

Outcome # 2

1. Outcome Target

Number of stormwater systems installing BMPs

2. Outcome Type : Change in Action Outcome Measure

2011:40	2012:42	2013:42	2014:42	2015:40
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3. Associated Knowledge Area(s)

- 133 - Pollution Prevention and Mitigation
- 402 - Engineering Systems and Equipment
- 403 - Waste Disposal, Recycling, and Reuse
- 404 - Instrumentation and Control Systems
- 405 - Drainage and Irrigation Systems and Facilities

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension

Outcome # 3

1. Outcome Target

Number of farms adopting use of biofuels

2. Outcome Type : Change in Action Outcome Measure

2011:25 2012:25 2013:25 2014:25 2015:28

3. Associated Knowledge Area(s)

- 401 - Structures, Facilities, and General Purpose Farm Supplies
- 511 - New and Improved Non-Food Products and Processes

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension

Outcome # 4

1. Outcome Target

Number of growers implementing improved irrigation and drainage systems

2. Outcome Type : Change in Knowledge Outcome Measure

2011:25 2012:25 2013:30 2014:30 2015:35

3. Associated Knowledge Area(s)

- 133 - Pollution Prevention and Mitigation
- 402 - Engineering Systems and Equipment
- 403 - Waste Disposal, Recycling, and Reuse
- 404 - Instrumentation and Control Systems
- 405 - Drainage and Irrigation Systems and Facilities

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research
- 1890 Extension

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

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

Description

Weather-related issues can and will have a major impact on engineering research and outreach projects. The economy and any changes in program funding can also have a significant impact on adoption or non-adoption of structural BMPs in agricultural operations and municipalities. Public policy and regulations will dictate, to a very large degree, the topics that are of most concern or interest to the agricultural producers, companies and municipalities, which will determine the kinds of projects and programs that are of interest. Limited funding will create significant impediments in a number of these research/outreach areas, since much of the research and extension efforts and the outputs generated from these intensive efforts.

V(K). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- After Only (post program)
- Retrospective (post program)
- Before-After (before and after program)
- During (during program)

Description

Some research studies and extension activities have formal evaluation protocols to establish base-line data. An example would be IPM programs where an initial assessment of pesticide use is necessary to determine the impact of the program. Similar, baseline studies on pest resistance to pesticides are necessary to determine if resistance management techniques are effective in preventing the development of resistance. The success of research programs is measured by peer reviewed publications. Measures such as the Science Citation Index are used to assess the impact of these publications.

2. Data Collection Methods

- Sampling
- Mail
- Telephone
- On-Site
- Structured
- Unstructured
- Observation

Description

Methods of data collection will vary among the individual research projects within this Planned Program. Extension activities use various measures including (i) meetings with traditional Stakeholder groups, (ii) surveys of traditional Stakeholder groups, (iii) meetings with traditional Stakeholder individuals, (iv) surveys of traditional Stakeholder individuals, (v) meetings specifically with non-traditional groups, (vi) meetings specifically with non-traditional individuals and (vii) meetings with invited selected individuals from the general public.

V(A). Planned Program (Summary)**Program # 6****1. Name of the Planned Program**

Food Production Systems: Development, Processing, Quality, and Safety

2. Brief summary about Planned Program

In North Carolina, the food industry has grown, diversified, and become a vital economic force for the state by providing jobs and adding value to raw agricultural products marketed worldwide. To continue the production of a high quality, safe, secure, and nutritious food supply and to sustain this dynamic industry requires the participation of discipline-focused basic and applied research and outreach activities that target all phases of the food production to table continuum. Faculties from multiple departments across NCSU and NC A&T will be directly engaged in activities that support the primary goals of this plan of work. Moreover, many other clientele groups will be directly or indirectly involved including producers, processors, agribusiness personnel, food retailers, and the general public. Following discovery, new food production, processing, and monitoring practices and technologies leading to new and improved value-added products will be disseminated to appropriate clientele groups using numerous educational and outreach methods. All participants and plans of work will be assessed at least yearly to assure continued progress and success.

3. Program existence : Intermediate (One to five years)**4. Program duration :** Long-Term (More than five years)**5. Expending formula funds or state-matching funds :** Yes**6. Expending other than formula funds or state-matching funds :** Yes**V(B). Program Knowledge Area(s)****1. Program Knowledge Areas and Percentage**

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
501	New and Improved Food Processing Technologies	20%	20%	20%	
502	New and Improved Food Products	15%	15%	15%	
503	Quality Maintenance in Storing and Marketing Food Products	10%	10%	10%	
504	Home and Commercial Food Service	5%	5%	5%	
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources	10%	10%	10%	
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	40%	40%	40%	
	Total	100%	100%	100%	

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

Food producers and processors will continue to strive to efficiently produce an abundant supply of high quality, safe, and nutritious supply of affordable food products. Even with the food industry's best efforts, new challenges and heightened expectations of consumers are naturally present and so will require the assistance from the land grant university system. The public's expectations of a safe and secure food system have put enormous pressure on the food industry. Since the events of 9/11/01, such contemporary issues as food biosecurity have added new meaning to food safety as the nation struggles with

the awesome task of securing our food supply. To be successful, this plan of work must engage a broad group of participants including, but not limited to, NCSU and NCA&T faculty and staff, North Carolina Cooperative Extension personnel, farmers, food processors, agribusiness personnel, local, state and federal regulatory officials, elected officials, food retailers, and the general public. To assure an abundant supply of high quality, safe, secure, nutritious, and affordable food products will require the expanded utilization and improvement of raw food materials, development of new efficient processing technologies, improved food quality, safety, security and traceability monitoring procedures, and methods for preventing, eliminating or reducing to an acceptable level microbiological and chemical safety hazards. Many of these accomplishments will be achieved in university laboratories and field trials yet the ultimate success will be based on the discoveries being translated into useful practices that are adopted by the food industry and other stakeholders. Thus, effective means of communicating research findings to appropriate stakeholder groups and training food industry personnel about appropriate handling procedures will also be identified and implemented through university-sponsored programs.

2. Scope of the Program

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

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

1. Assumptions made for the Program

The basic assumptions to satisfactorily accomplish the stated goals of this plan of work would include having adequate funding and a critical number of faculty, support staff, and graduate students to support the proposed research and outreach efforts. Other assumptions are that project participants will take advantage of opportunities as they arise, will be successful in identifying solutions to the stated problems, will effectively deliver the findings to the targeted stakeholders, that the stakeholders will put into practice the new knowledge, practices, and technologies, and that companies will be able to sustain their businesses by producing affordable food products that are of high quality, safe, secure, and nutritious.

2. Ultimate goal(s) of this Program

Foods produced in North Carolina as a result of discoveries and outreach activities described in this project will be high quality, safe and secure, and highly nutritious so as to assure the sustainability of the food industry and enhance consumer confidence.

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
2011	54.0	0.0	63.0	0.0
2012	54.0	0.0	63.0	0.0
2013	54.0	0.0	63.0	0.0
2014	54.0	0.0	63.0	0.0
2015	55.0	0.0	61.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

Multiple research and educational outreach programs will be conducted that fit under the broad umbrella of improving the quality, safety, security, and nutrition of food products produced in North Carolina. Specific research projects will identify effective nutritional control strategies for replacement of growth-promoting antibiotics for improving gut function and reducing intestinal colonization and shedding of Salmonella; assessing the incidence, populations, serotypes, genotypes, and antibiotic susceptibility of Salmonella and Campylobacter fecal isolates as a function of farm, bird age, season, management practices, and strategic processing of commercial broiler, turkey, and layer farms; assessing novel antimicrobial strategies for use in reducing foodborne pathogens and biofilm formation on food processing contact surfaces; employing the antimicrobial properties of eggshell membranes for reducing the heat resistance of foodborne pathogens; development of Salmonella-specific inhibitory nanoparticles for preventing intestinal colonization; development of alternative layer molting diets for reducing the risk of Salmonella contamination of shell eggs; characterization of Campylobacter respiratory chain genes for use in developing rational drugs for controlling infection of food animals; conduct ecotoxicological studies to identify chemical pollutant sources that contaminate aquatic human foods; development of a high hydrostatic pressure system for reducing toxigenic histamine-forming bacteria in scombroid fish and vacuum and MAP packaged fresh tuna; develop a more efficient means of producing a high-gelling protein isolate from underutilized fish species and other meat sources that could replace surimi manufacture and improve the quality, sensory and yield characteristics of new and existing muscle food products; development of a Vienna sausage product without casings via an in-tube focused microwave field heating technology; improving the texture and yield of canned/pouched Albacore tuna by controlling precook proteolysis and injection of a tuna-derived protein isolate; application of continuous flow processing of foods and biomaterials using advanced focused microwave technology; and development and testing of tools, methods and devices for rapid sterilization and production of high quality vegetable and fruit purees. A very important aspect of this plan of work is to transfer technology and knowledge to our stakeholders and clientele. Therefore, an extensive outreach effort will involve campus and field faculty located in local communities. Direct outreach efforts will include engaging stakeholders in workshops, conferences, discussion groups, one-on-one teaching, demonstrations, field trials, short courses, continuing education classes, and scientific meetings. Indirect methods will include internet sites and courses, newsletters, press releases, television and radio interviews and programming, trade journals, scientific journals and popular press articles. Participants and programs will be evaluated at least annually for success, progress, and impact.

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

Extension

Direct Methods	Indirect Methods
<ul style="list-style-type: none"> ● Education Class ● Workshop ● Group Discussion ● One-on-One Intervention ● Demonstrations ● Other 1 (Short Courses) ● Other 2 (Scientific Meetings) 	<ul style="list-style-type: none"> ● Public Service Announcement ● Newsletters ● TV Media Programs ● Web sites ● Other 1 (Trade Journals) ● Other 2 (Scientific Journals)

3. Description of targeted audience

Primary food producers, food processors, foodservice operators, county extension agents, state and federal regulatory agencies, commodity associations, news media and consumers. The primary audience will be in North Carolina but will also extend to audiences in other states (state and federal agencies, local, state and federal politicians and other stakeholders).

V(G). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons(contacts) to be reached through direct and indirect contact methods

	Direct Contact Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
2011	3300	6300	0	0
2012	3450	6350	0	0
2013	3500	6900	0	0
2014	3500	6900	0	0
2015	3600	7100	125	125

2. (Standard Research Target) Number of Patent Applications Submitted

2011:5 2012:5 2013:5 2014:5 2015:7

3. Expected Peer Review Publications

Year	Research Target	Extension Target	Total
2011	60	12	72
2012	60	12	72
2013	60	12	72
2014	60	12	72
2015	65	10	75

V(H). State Defined Outputs

1. Output Target

- Highly focused non-degree credit group training activities to be conducted

2011:400 2012:400 2013:400 2014:400 2015:400

- Relevant and impacts focused research projects to be conducted

2011:50 2012:50 2013:50 2014:50 2015:52

- Local, area, regional and state conferences to be conducted

2011:20 2012:20 2013:20 2014:20 2015:18

- Number of firms adopting quality and safety strategies

2011:252 2012:253 2013:254 2014:255 2015:265

V(I). State Defined Outcome

O. No.	Outcome Name
1	Number of program participants who successfully pass the food safety certification examination.
2	Number of participants completing National Seafood HACCP Alliance Education and other food safety HACCP workshops
3	Number of companies adopting new technologies
4	Number of new companies in food manufacturing
5	Number of food industry companies undergoing equipment and food safety audits

Outcome # 1

1. Outcome Target

Number of program participants who successfully pass the food safety certification examination.

2. Outcome Type : Change in Knowledge Outcome Measure

2011:1300 2012:1350 2013:1350 2014:1350 2015:1400

3. Associated Knowledge Area(s)

- 501 - New and Improved Food Processing Technologies
- 502 - New and Improved Food Products
- 503 - Quality Maintenance in Storing and Marketing Food Products
- 504 - Home and Commercial Food Service
- 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
- 1890 Extension

Outcome # 2

1. Outcome Target

Number of participants completing National Seafood HACCP Alliance Education and other food safety HACCP workshops

2. Outcome Type : Change in Knowledge Outcome Measure

2011:450 2012:550 2013:600 2014:600 2015:620

3. Associated Knowledge Area(s)

- 501 - New and Improved Food Processing Technologies
- 502 - New and Improved Food Products
- 503 - Quality Maintenance in Storing and Marketing Food Products
- 504 - Home and Commercial Food Service
- 711 - Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 3

1. Outcome Target

Number of companies adopting new technologies

2. Outcome Type : Change in Knowledge Outcome Measure

2011:70	2012:70	2013:70	2014:70	2015:68
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3. Associated Knowledge Area(s)

- 501 - New and Improved Food Processing Technologies
- 502 - New and Improved Food Products
- 503 - Quality Maintenance in Storing and Marketing Food Products
- 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

Number of new companies in food manufacturing

2. Outcome Type : Change in Knowledge Outcome Measure

2011:10	2012:10	2013:10	2014:10	2015:8
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3. Associated Knowledge Area(s)

- 501 - New and Improved Food Processing Technologies
- 502 - New and Improved Food Products
- 503 - Quality Maintenance in Storing and Marketing Food Products
- 504 - Home and Commercial Food Service
- 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 # 5

1. Outcome Target

Number of food industry companies undergoing equipment and food safety audits

2. Outcome Type : Change in Action Outcome Measure

2011:25

2012:25

2013:25

2014:25

2015:28

3. Associated Knowledge Area(s)

- 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
- 1890 Extension

V(J). Planned Program (External Factors)**1. External Factors which may affect Outcomes**

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

Description

Anything that competes for public funding or that affects public policy can have an impact on this plan of work. Should significant external factors occur, many of the participants in this plan of work could have their funding, activities, or both re-directed. Changes in appropriations could affect funding support while changes in food regulations, public priorities, and population changes could affect specific program activities. Catastrophic events, such as hurricanes, could seriously affect funding and program activities for extended periods of time.

V(K). Planned Program (Evaluation Studies and Data Collection)**1. Evaluation Studies Planned**

- After Only (post program)
- Retrospective (post program)
- Before-After (before and after program)
- During (during program)
- Comparisons between program participants (individuals, group, organizations) and non-participants
- Comparisons between different groups of individuals or program participants experiencing different levels of program intensity.

Description

Evaluation is a basic component of most funded projects. Some studies will attempt to quantify pre-investigation baseline parameters and then estimate change caused by the implementation of specific practices, technologies, discoveries. Other studies will seek to quantify the rate of change during a program. When possible, program participants will be compared to a non-participatory control group. All programs will be evaluated at least yearly to

measure effect and impact. Stakeholders and clientele will be surveyed periodically to determine the relevance of current programs and to ascertain the need for redirection of programs.

2. Data Collection Methods

- Sampling
- Whole population
- Mail
- Telephone
- On-Site
- Structured
- Unstructured
- Observation
- Tests

Description

Evaluation of program effectiveness will be tracked through the Extension Learning Management System and through the Extension Reporting System where campus and field faculty report success stories and program impacts. Stakeholder input will be gathered using a variety of methods -- surveys, environmental scans and during advisory board meetings and other forums such as workshops, conferences and short courses.

V(A). Planned Program (Summary)**Program # 7****1. Name of the Planned Program**

Human Nutrition and Health

2. Brief summary about Planned Program

The Nutrition and Health program will promote optimum nutrition and health through diet and lifestyle in all North Carolinians regardless of gender, income, age, or race/ethnicity. Education programs addressing diet, healthy, and chronic disease prevention will be offered to North Carolinians of diverse income levels, age groups, genders, and/or cultural backgrounds across the state. Extensive research efforts are focusing on insects and other pests affecting human health, and these vector pests are a key concern of researchers and Extension specialists. For example, one third of all cases of tick-borne Rocky Mountain spotted fever (RMSF) in the US were reported in NC in 2005. Mosquitoes and other insect vectors are also threats to human health. Research programs are underway that are focusing on identifying and controlling the tick species that is the vector for Rocky Mountain Spotted Fever. Studies are underway to identify an all-natural botanical insect repellent for both tick and mosquitoes. Biochemical processes are being studied for the development and production of vaccines against insect vectored diseases. Furthermore, several methods are being used to make genome-wide historical inferences of mutation, recombination and inbreeding in the genome of *P. falciparum*, which is the causative agent of malaria. The research programs are expected to continue to focus key biological sciences resources on these and other threats to human health.

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

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

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

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

V(B). Program Knowledge Area(s)**1. Program Knowledge Areas and Percentage**

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
702	Requirements and Function of Nutrients and Other Food Components	15%	15%	15%	
703	Nutrition Education and Behavior	25%	25%	25%	
721	Insects and Other Pests Affecting Humans	10%	10%	10%	
724	Healthy Lifestyle	50%	50%	50%	
	Total	100%	100%	100%	

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

Public interest and concern about nutrition and health issues are at an all-time high. While more consumers than ever are aware of the major issues, fewer can put those concepts into everyday practice. Consumers continue to need help in using the Dietary Guidelines for Americans and MyPyramid.gov to incorporate balance, moderation and variety in their diets as well as to increase physical activity. Dietary factors are associated with five of the ten leading causes of death in N.C. (and in the U.S.), including coronary heart disease, some types of cancer, stroke, noninsulin-dependent diabetes mellitus, and atherosclerosis. Overweight and obesity have reached epidemic proportions and have become one of the most pressing health issues for our nation and state. These conditions are increasing in all age groups of all races and ethnicities. Sixty-five percent of adults in the US are overweight or obese. There are almost twice as many overweight children and three times as

many overweight teens today as there were two decades ago. There is a greater prevalence for overweight and obesity in limited resource and minority youth. Action by a broad array of individuals and public and private partners is essential to reverse this trend.

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

1. Continued funding at current level 2. State and county staff to support the program 3. External grants to leverage federal, state and local funding

2. Ultimate goal(s) of this Program

North Carolinians, including limited resource individuals and families, will improve the quality of their lives through eating healthy, being active, managing resources for food security, and practicing health promoting behaviors. Research findings are expected to significantly impact the control and prevention of human diseases influenced by insects and other pests.

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
2011	35.0	2.5	17.0	0.0
2012	35.0	2.5	17.0	0.0
2013	35.0	2.5	17.0	0.0
2014	35.0	2.5	17.0	0.0
2015	35.0	2.0	18.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

The Nutrition and Health program will promote optimum nutrition and health through diet and lifestyle in all North Carolinians regardless of gender, income, age, or race/ethnicity. Education programs addressing diet, healthy, and chronic disease prevention will be offered to North Carolinians of diverse income levels, age groups, genders, and/or cultural backgrounds across the state. Programs offered will include Give Your Heart A Healthy Beat, Project Eat Right: Add to Life Program, Color Me Healthy, Moving Towards a Healthier You, Dining with Diabetes, SyberShop, Women Living Healthy - Women Living Well, and Families Eating Smart and Moving More. Programs will be held in many different settings including congregate nutrition sites, senior centers, schools, churches, government buildings, businesses, daycare centers, work sites and outdoors. Various methods will be employed including using the Internet, computers, mailed materials, media, one-on-one contact, and public meeting. Research projects will continue or be undertaken to seek scientific discoveries that will enhance the quality of living for the states' and nation's human population.

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

Extension

Direct Methods	Indirect Methods
<ul style="list-style-type: none"> • Education Class • Workshop • One-on-One Intervention • Demonstrations 	<ul style="list-style-type: none"> • Public Service Announcement • Newsletters • TV Media Programs • Web sites

3. Description of targeted audience

Audiences reached included children, adults and the elderly, day care workers, hospital employees, housing authorities, Head Start, Red Cross, food banks, daycare home providers, food stamp and WIC recipients and community coalitions. No time is more important than childhood to promote healthy eating and health practices. Children in North Carolina do not consume enough fruits or vegetables and have diets that are low in fiber and higher in fat than recommended. Children in North Carolina need quality nutrition education to help positively influence their food choices. For nutrition education efforts to be effective they must also include parents and care givers. Helping families make informed decisions about their nutrition will help ensure that North Carolina's children grow to reach their full mental and physical potential. Overweight in children in North Carolina continues to rise. Treatment of overweight and obesity is difficult. Preventing overweight and obesity in children is essential to address this issue. Demographic changes in North Carolina's population continue to impact nutrition and health issues. The fastest growing age group in the state is the 65 years-and-over segment. The elderly run disproportionate risks of malnutrition and poverty as well as poor overall health status. In fact, over 85% of older adults suffer from chronic diseases and could benefit from dietary intervention. The general nutrition needs of the well elderly must be addressed; however, the needs of the elderly for prevention of malnutrition and chronic disease actually begin much earlier in life. Programs addressed to young adults and the middle-aged consumers will continue to impact the health of the population as it "ages." Women are employed in greater numbers, and many of them are among the ranks of the working poor. Over 80% of women who had school-aged children were working outside the home; 67% of women with youngest child under six years were in the labor force. For working parents with very limited resources, lack of after-school and summer programs for youth are a major concern.

V(G). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons(contacts) to be reached through direct and indirect contact methods

	Direct Contact Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
2011	99000	100000	25500	42500
2012	100000	100000	25500	42500
2013	100000	100000	25500	42500
2014	100000	100000	25000	42500
2015	120000	120000	24500	47500

2. (Standard Research Target) Number of Patent Applications Submitted

2011:2

2012:2

2013:2

2014:2

2015:2

3. Expected Peer Review Publications

Year	Research Target	Extension Target	Total
2011	4	12	16
2012	4	12	16
2013	4	12	16
2014	4	12	16
2015	6	14	20

V(H). State Defined Outputs

1. Output Target

- Non-degree credit group activities conducted on Foods and Nutrition Education

2011:2200

2012:2200

2013:2200

2014:2200

2015:2200

- Targeted audiences participate in workshops on food and nutrition

2011:19000

2012:19000

2013:19000

2014:19000

2015:19400

- Conduct research projects on vectors, their influences on human health and their control.

2011:5

2012:5

2013:5

2014:5

2015:5

V(I). State Defined Outcome

O. No.	Outcome Name
1	Program participants increase knowledge that will promote a healthier diet
2	Program participants increase skills that will promote a healthier diet
3	Educational program participants make one or more positive dietary change
4	Program participants decrease body weight.
5	Program participants decrease blood pressure.
6	Program participants increase physical activity.
7	Program participants increase their fruit and vegetable consumption by at least one serving.
8	Research projects produce findings that can and will have an impact on the knowledge of and control of vectors that impact human health and safety.

Outcome # 1

1. Outcome Target

Program participants increase knowledge that will promote a healthier diet

2. Outcome Type : Change in Knowledge Outcome Measure

2011:20800 2012:20900 2013:20900 2014:20900 2015:24000

3. Associated Knowledge Area(s)

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

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

Outcome # 2

1. Outcome Target

Program participants increase skills that will promote a healthier diet

2. Outcome Type : Change in Knowledge Outcome Measure

2011:20800 2012:20900 2013:20900 2014:20900 2015:33000

3. Associated Knowledge Area(s)

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

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

Outcome # 3

1. Outcome Target

Educational program participants make one or more positive dietary change

2. Outcome Type : Change in Action Outcome Measure

2011:16800 2012:16850 2013:16850 2014:16850 2015:18000

3. Associated Knowledge Area(s)

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

- 724 - Healthy Lifestyle

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

Outcome # 4

1. Outcome Target

Program participants decrease body weight.

2. Outcome Type : Change in Condition Outcome Measure

2011:1300 2012:1300 2013:1300 2014:1300 2015:1600

3. Associated Knowledge Area(s)

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

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

Outcome # 5

1. Outcome Target

Program participants decrease blood pressure.

2. Outcome Type : Change in Condition Outcome Measure

2011:1500 2012:1500 2013:1500 2014:1500 2015:1600

3. Associated Knowledge Area(s)

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

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

Outcome # 6

1. Outcome Target

Program participants increase physical activity.

2. Outcome Type : Change in Condition Outcome Measure

2011:2000 2012:2000 2013:2000 2014:2000 2015:2500

3. Associated Knowledge Area(s)

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

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

Outcome # 7

1. Outcome Target

Program participants increase their fruit and vegetable consumption by at least one serving.

2. Outcome Type : Change in Action Outcome Measure

2011:2000 2012:2000 2013:2000 2014:2000 2015:2500

3. Associated Knowledge Area(s)

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

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

Outcome # 8

1. Outcome Target

Research projects produce findings that can and will have an impact on the knowledge of and control of vectors that impact human health and safety.

2. Outcome Type : Change in Condition Outcome Measure

2011:5 2012:5 2013:5 2014:5 2015:5

3. Associated Knowledge Area(s)

- 721 - Insects and Other Pests Affecting Humans

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

Possible reduction in budget support for program area, reductions in state and county staff that develop and implement programs, natural disasters that impact extension's ability to deliver programs (due to budget and travel restrictions), changes in public policy or mandates that relate to program area, and increases in minority ethnic populations. Availability of adequate grant funds is also a major external factor.

V(K). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- After Only (post program)
- Before-After (before and after program)
- During (during program)
- Comparisons between program participants (individuals, group, organizations) and non-participants

Description

Extension educators will conduct evaluation to determine the impact of educational programs. The educational program, funding requirements and learning objectives for the program will determine the type of evaluation study conducted. County agents will also collect success stories that will serve as case study examples of program impact. Results of research studies will be assessed by peers and professional applications for real world use and utility.

2. Data Collection Methods

- Sampling
- Whole population
- Mail
- Telephone
- On-Site
- Unstructured
- Observation

Description

Extension educators will use a variety of methods to collect data. The target group for evaluation, type of program, information to be gathered and available funding will determine the specific method used for evaluation. Evaluation methods will include (but aren't limited to) whole population sampling, on-site surveys and mail surveys. County agents will also collect success stories that will serve as case study examples of program impact.

V(A). Planned Program (Summary)**Program # 8****1. Name of the Planned Program**

Families and Communities

2. Brief summary about Planned Program

In an attempt to help families better understand the importance of being financially secure now and in the future, Extension Family and Consumer Science Agents and Specialists provide programs and training to assist families developing basic skills such as: setting family and financial goals, developing a spending and savings plan, understanding credit and the credit report, reducing debt and preparing for retirement, to enhance family resiliency, and continuity. Family and Consumer Science Agents and Specialists will provide educational learning experiences that improve the quality of life for limited resource families through increased knowledge and skills in parenting, interpersonal relationships, and utilizing community resources.

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

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

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

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

V(B). Program Knowledge Area(s)**1. Program Knowledge Areas and Percentage**

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
801	Individual and Family Resource Management	34%	34%	34%	
802	Human Development and Family Well-Being	33%	33%	33%	
804	Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures	33%	33%	33%	
	Total	100%	100%	100%	

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

The basic unit of society is the family. Rapid changes in society create multiple family challenges and stressors. Concerns arise regarding childcare, child abuse, coping with parenting, grand parenting, and financial stress. Families, especially those with limited resources, are stressed economically and emotionally, do not understand children's needs are at risk for abusive behaviors. There are 11,234 children under the supervision and custody of social services in NC. There are increasing numbers of substantiated child abuse and neglect cases. The 2000 Census reports that nearly 80,000 grandparents in NC are responsible for and have grandchildren living with them. Children whose parents have a serious problem such as substance abuse or mental health issues are often placed with grandparents or in the foster care system. Many individuals and families are experiencing financial crisis because of inadequate savings, too much debt, and poor planning for potential major life events. Reports indicate that more than half of Americans report living paycheck to paycheck. Individuals and families often lack basic skills in financial decision making, planning and stretching financial resources. During the past decade, the rate of personal bankruptcy in the U.S. rose by 69 percent. Filing for bankruptcy and making late or no payments remains on a credit report for years and prevents families from successfully achieving future financial goals. As a result, families in financially stressful situations are making decisions that cause long term serious financial consequences. These threats to financial security of families are of special concern for low to moderate income families, the working poor, minorities and women. Improved financial management skills and practices that promote asset

building serve as important anti-poverty strategy. An improved asset position can increase the intergenerational transmission of assets and help break the poverty cycle. Seventy-three percent of black children grow up in households with zero or negative financial assets. The working poor, rural workers and minorities are more likely than majority households to have no savings, lack adequate retirement income, fall prey to fraudulent practices that cause them to lose the assets they acquire, possess bad credit which prevents asset acquisition, have little trust in saving instruments that could help increase their wealth building capabilities, and find it difficult to acquire and keep a home. Low income families also find it hard to be economically self-sufficient and able to obtain economic resources to prevent insolvency. Housing generally represents the single largest expenditure for most families. Foreclosures are on the increase both across the nation and in North Carolina. Costs associated with housing, but that are not a part of the mortgage or monthly rent are also substantial. On average, US homeowners (single family homes) spend almost \$1500 a year on energy costs. In 1999, Americans spent over \$180 billion dollars on home improvement and repair projects. In addition to financial concerns, housing also has safety concerns. Homes can contain hidden hazards, both seen and unseen, and both inside and surrounding home. These hazards include building structural safety, electrical safety, fire safety, lead hazards, and indoor air quality issues such as mold, carbon monoxide, etc. While these hazards affect people of all ages, the elderly and children are often at greater risk.

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

Continued budget and administrative support for program

Staff will continue to support

Best practices will work

Individuals and families can improve their financial situation · Limited resource families can improve their quality of life through enhanced family relationships · Collaborative partnerships can make a difference in the lives of limited resource families

2. Ultimate goal(s) of this Program

Parents and caregivers will increase use of positive parenting practices to reduce or eliminate instances of child abuse and neglect

Consumers and families will make and use money management plans to reduce debt, increase saving for retirement and other short-term and long-term goals and buy a home.

Consumers and families will develop skills to help maintain and/or increase the value of their homes.

Consumers and families will learn to create healthy, safe homes.

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
2011	25.0	5.0	11.0	0.0
2012	25.0	5.0	11.0	0.0
2013	25.0	5.0	11.0	0.0

Year	Extension		Research	
	1862	1890	1862	1890
2014	25.0	5.0	11.0	0.0
2015	25.0	4.0	11.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

- Develop and Conduct Family Resource Management, Healthy Housing and Parenting Trainings and Workshops. - Educational workshops for consumers related to family resource management, debt reduction, developing budgets and savings plans will be included in these trainings. Trainings will also be designed to include low to moderate income families and families headed by women. Educational workshops for consumers related to reducing home hazards. - Dissimination of research findings related to family resource management, housing and parenting. - Establish and/or maintain collaborative partnerships with agencies/organizations serving limited resource families.

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

Extension

Direct Methods	Indirect Methods
<ul style="list-style-type: none"> ● Education Class ● Workshop ● Group Discussion ● One-on-One Intervention ● Demonstrations ● Other 1 (Printed Materials) ● Other 2 (Conferences/Seminars) 	<ul style="list-style-type: none"> ● Public Service Announcement ● Newsletters ● TV Media Programs ● Web sites ● Other 1 (Exhibits) ● Other 2 (CDs, DVDs, Videos)

3. Description of targeted audience

The target audience for programs includes individual/family consumers, working poor, low to moderate income, minorities, women whose poor economic decisions, ability, and other socio-economic factors make them more at risk of experiencing negative consequences than other families, youth/students, homeowners, families with young children, limited resource parents, caregivers, court mandated or DSS referred parents, grandparents raising grandchildren in North Carolina.

V(G). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons(contacts) to be reached through direct and indirect contact methods

	Direct Contact Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
2011	40550	120300	3200	8400
2012	41000	120400	3200	8400
2013	41000	120500	3200	8500

	Direct Contact Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
2014	41000	120500	3200	0
2015	41200	120600	3100	8600

2. (Standard Research Target) Number of Patent Applications Submitted

2011:0 2012:0 2013:0 2014:0 2015:0

3. Expected Peer Review Publications

Year	Research Target	Extension Target	Total
2011	0	13	13
2012	0	13	13
2013	0	13	13
2014	0	13	13
2015	0	15	15

V(H). State Defined Outputs**1. Output Target**

- Develop and conduct Family Resource Management training and workshops.

2011:20	2012:20	2013:20	2014:20	2015:22
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- Educational workshops for consumers related to family resource management, debt reduction, developing budgets and savings plans -

2011:25	2012:25	2013:25	2014:25	2015:26
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- Conduct educational workshops for consumers related to parenting and family life.

2011:65	2012:65	2013:70	2014:70	2015:72
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- Conduct Healthy Homes trainings for health and housing professionals.

2011:4	2012:4	2013:4	2014:4	2015:3
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- Parents mandated by the court and agency referred parents consistently using positive parenting strategies.

2011:230	2012:230	2013:230	2014:230	2015:230
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- Develop and conduct financial education workshops for community based financial educators.

2011:30	2012:30	2013:30	2014:30	2015:25
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- Conduct educational workshops related to energy efficiency and conservation.

2011:40	2012:40	2013:40	2014:40	2015:42
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V(I). State Defined Outcome

O. No.	Outcome Name
1	Parents adopting appropriate guidance/supervision practices.
2	Individuals and families will follow a household budget.
3	Individuals and families will increase savings.
4	Individuals/families will reduce debt.
5	Individuals/families will participate in retirement planning.
6	Individuals, businesses, industries and governments engaging in best management practices related to energy use/conservation.
7	Individuals participating in the Healthy Homes Specialist certification exam.

Outcome # 1

1. Outcome Target

Parents adopting appropriate guidance/supervision practices.

2. Outcome Type : Change in Knowledge Outcome Measure

2011:2000 2012:2000 2013:2000 2014:2000 2015:2100

3. Associated Knowledge Area(s)

- 802 - Human Development and Family Well-Being

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

Outcome # 2

1. Outcome Target

Individuals and families will follow a household budget.

2. Outcome Type : Change in Knowledge Outcome Measure

2011:1500 2012:1500 2013:1500 2014:1500 2015:1600

3. Associated Knowledge Area(s)

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

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

Outcome # 3

1. Outcome Target

Individuals and families will increase savings.

2. Outcome Type : Change in Knowledge Outcome Measure

2011:1100 2012:1100 2013:1100 2014:1100 2015:1200

3. Associated Knowledge Area(s)

- 801 - Individual and Family Resource Management
- 802 - Human Development and Family Well-Being

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

Outcome # 4

1. Outcome Target

Individuals/families will reduce debt.

2. Outcome Type : Change in Knowledge Outcome Measure

2011:500 2012:500 2013:500 2014:500 2015:600

3. Associated Knowledge Area(s)

- 801 - Individual and Family Resource Management
- 802 - Human Development and Family Well-Being

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

Outcome # 5

1. Outcome Target

Individuals/families will participate in retirement planning.

2. Outcome Type : Change in Knowledge Outcome Measure

2011:800 2012:800 2013:800 2014:800 2015:950

3. Associated Knowledge Area(s)

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

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

Outcome # 6

1. Outcome Target

Individuals, businesses, industries and governments engaging in best management practices related to energy use/conservation.

2. Outcome Type : Change in Knowledge Outcome Measure

2011:2500 **2012:**2500 **2013:**2500 **2014:**2500 **2015:**2400

3. Associated Knowledge Area(s)

- 802 - Human Development and Family Well-Being
- 804 - Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

Outcome # 7

1. Outcome Target

Individuals participating in the Healthy Homes Specialist certification exam.

2. Outcome Type : Change in Action Outcome Measure

2011:30 **2012:**30 **2013:**30 **2014:**30 **2015:**28

3. Associated Knowledge Area(s)

- 804 - Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

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

Description

Reduction in budget support for program area, reduction in State and County staff that develop and implement programs, natural disasters that impact extension's ability to deliver programs (due to budget and travel restrictions), changes in public policy or mandates that relate to program area, increase in minority ethnic populations.

V(K). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- After Only (post program)
- Before-After (before and after program)
- During (during program)
- Case Study
- Other (Data provided by collaborators)

Description

Extension educators will conduct evaluation to determine the impact of educational programs. The educational program, funding requirements and learning objectives for the program will determine the type of evaluation study conducted. County agents will also collect success stories that will serve as case study examples of program impact.

2. Data Collection Methods

- Sampling
- Mail
- Telephone
- On-Site
- Case Study
- Observation
- Tests

Description

Extension educators will use a variety of methods to collect data. The target group for evaluation, type of program, information to be gathered and available funding will determine the specific method used for evaluation. Evaluation methods will include (but aren't limited to) whole population sampling, on-site surveys, mail surveys and telephone surveys. County agents will also collect success stories that will serve as case study examples of program impact.

V(A). Planned Program (Summary)

Program # 9

1. Name of the Planned Program

Youth Development

2. Brief summary about Planned Program

The Developing Responsible Youth Program is interwoven throughout all nine statewide program goals of North Carolina Cooperative Extension. This collaborative Initiative is led primarily through the efforts of the North Carolina 4-H Youth Development Program and the Department of 4-H Youth Development and Family & Consumer Sciences in the College of Agriculture and Life Sciences at North Carolina State University, and the Cooperative Extension Program at North Carolina A & T State University. It is designed to drive collaboration with and among all agencies, programs and organizations dedicated to the well being of young people in our state. Program staffs are encouraged to adapt educational programs to local situations in the context of the outcomes of the National 4-H Impact Assessment Project. That project created a list of program characteristics most likely to engender positive youth outcomes when incorporated into youth programming. Those critical program characteristics are:

A positive relationship with a caring adult:

A physically and emotionally safe environment:

The opportunity to value and practice service for others:

An opportunity for self-determination;

An inclusive environment:

An opportunity to see oneself as an active participant in the future:

Engagement in learning; and

Opportunity for mastery. Our initiative is designed to actively engage youth, volunteers, stakeholders, and youth development professionals "to create helping relationships to enable youths to become responsible, productive citizens." Through 4-H and other, allied youth development programs young people are empowered to invest and grow cognitive, social, physical and emotional skills to reach their full potential for becoming coping, competent and contributing participants in their friendship and peer groups, families, schools and communities. The Initiative focuses on utilization of experiential, non-formal, community based youth development practices which recognize the worth and dignity of every individual, and believe that the development of life skills enables young people to become caring, coping and competent citizens who will build strong foundations for our future. In the spirit of this shared value, the initiative is committed to the well being of and seeks to maintain the confidence of youth, volunteers, stakeholders, the Extension System, and all youth development professionals.

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

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

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

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

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
806	Youth Development	100%	100%	100%	
	Total	100%	100%	100%	

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

One of the most pressing social issues we face in North Carolina is how to provide our youth with a solid foundation for life. The evidence that the foundation is fragile appears year after year in newspaper articles and scientific studies that call attention to the challenge and problems facing too many youth: obesity, persistently high rates of alcohol and other drug use, teenage pregnancy, violence, school failure, and many more. The concept of positive youth development suggest that youth are capable of growing up properly and avoiding trouble if they are involved in social resources that facilitate and discourage harmful behavior. Extension, through 4-H, strives to build social resources in communities where low income and minority youth reside. The development of these resources will effectively facilitate learning activities that promote positive behavior. Youth without these resources are generally overrepresented in statistics on crime, school failure, adolescent pregnancies, family violence, and homelessness. Minority and low income families are often viewed as households with problem children without promising futures. Extension in North Carolina will ensure that creatively built strategies are implemented through 4-H that address the needs of youth. The goal is to promote positive outcomes that help overcome poor life conditions that ultimately aid in breaking the poverty cycle. Many of the factors linked to the negative statistics that describe poor and minority youth are often addressed at times when reshaping lives and minds is more difficult. Simultaneously, new concerns are being voiced about whether we are building the kinds of skills and competencies needed to ensure a competent work force and an engaged citizenry. But this is not the end of the story. The mosaic of young people's lives has hopeful theme. That hope becomes evident in the potential that life skills and developmental assets have to shape young people's choices. Through its 4-H program, Extension is intentionally working to ensure that more young people experience many of the life skills and assets, which offer a positive and hopeful path to a brighter future for young

2. Scope of the Program

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

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

Extension 4-H Youth Development contributes to developing responsible youth through 21st century life skill education. Educational efforts focus on 21st century life skill development. Through 4-H club, school enrichment, special interest, camping, K-12 programs, and resilient youth programming young people develop social competence, problem solving, autonomy and a sense of purpose and future. A wide variety of learning and leading experiences can help youth and empower families to avoid risks, build assets, and prepare for meaningful adult roles in family, work, and civic engagement. Extension 4-H Youth Development teaches youth workforce and employability skills. Educational efforts focus on the continuously changing nature of the world of work. Despite the fact that a high school degree is considered a basic educational credential in today's society, to access employment that pays a living wage, it is not the only employability prerequisite required by our global workplace. Programs provide opportunities for youth to learn about the breath of career paths available in our global economy and develop critical skills in resume writing, interviewing, financial management, and public speaking to solidify their chances of securing a job and creating a viable career plan. Extension 4-H Youth Development contributes to enhancing and developing quality school-age childcare programs. Educational efforts focus on changes in the structure and employment of North Carolina families and the impact this trend has on

the availability, affordability and accessibility to high quality school-age programs. Even in communities where after school programs may be available, low staff wages and benefits, staff turnover, lack of staff training, low staff to child ratios, lack of transportation, lack of age appropriate curricula, and other obstacles create problems of offering quality programs and maintaining them. Extension personnel provide relevant and just-in-time training and program support to after school, daycare and home day care providers as well as serve as advocates and community resources for higher standards in after school and daycare programs. Extension 4-H Youth Development contributes to developing leadership and volunteerism. Educational efforts focus on emphasizing youth as equal partners and developing strong youth/adult partnerships. Programs empower, prepare, and engage teens for their current and future roles and responsibilities as citizens of a global society. Youth and adults are encouraged to pursue volunteerism as both a means to an end, and as an end in itself by focusing upon the gifts and assets that each individual volunteer has to contribute towards Extension's mission and vision.

2. Ultimate goal(s) of this Program

The Developing Responsible Youth initiative of the North Carolina Cooperative Extension Service fosters 21st century life skill growth and strengthens communities through its 4-H Youth Development Program. The 4-H Youth Development Program designs, implements and evaluates programs targeting six Long Range Focus Areas: 1) Healthy eating, physical activity and chronic disease risk reduction; 2) Preparing youth for an employable future and economic success; 3) Building community through volunteerism; 4) Building citizen leaders; 5) Developing Life Skills and 5) K-12 Academic Achievement and Educational Success. The public outcry for academic achievement, improved behavior and the enhanced potential for future economic success among low income and minority youth in North Carolina is a major opportunity for 4-H Youth Development. As schools, local governments and others begin to carve out solutions, 4-H should be viewed as a "community-based solution" to address these needs.

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
2011	52.0	7.0	0.0	0.0
2012	52.0	7.0	0.0	0.0
2013	52.0	7.0	0.0	0.0
2014	52.0	7.0	0.0	0.0
2015	52.0	7.0	0.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

Objectives listed under the six Long Range Focus Areas are accomplished by teams of campus/field based youth development educators. Each team continuously works to accomplish three related, overlapping focus area/objectives specific processes. Each team works to build youth development professional practices and expand the impact of evaluations as they: 1) Scan the environment for emerging focus area specific and deliver programs responsive for those existing and emerging needs. 2) Design and deliver programs responsive to those existing and emerging needs. 3) Design evaluation tools to facilitate program impacts for reporting into the Extension Reporting System. Each team will produce, share and implement the following program-wide set of elements: Focus/Objectives Teaching Points Situation Statement Evaluation strategies: 1) Measures of Progress; 2) Impact Indicators Related Research Programming Resources Target Audiences. Youth development professionals and volunteers working with low income and minority youth will be engaged in various phases of the program design and development. They will also assist with pilot testing developed educational products. Strategies to increase access to 4-H programs in local communities will be built by matching income youth. This strategy will promote the building of a strong network of individuals equipped to address the unique needs of the targeted

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

Extension

Direct Methods	Indirect Methods
<ul style="list-style-type: none"> ● Education Class ● Workshop ● Group Discussion ● One-on-One Intervention ● Demonstrations ● Other 1 (4-H Clubs) ● Other 2 (4-H School Enrichment) 	<ul style="list-style-type: none"> ● Public Service Announcement ● Billboards ● Newsletters ● TV Media Programs ● Web sites ● Other 1 (4-H After school) ● Other 2 (4-H Resident and Day Camps)

3. Description of targeted audience

The Development Responsible Youth Initiative is designed to drive collaboration with and among all agencies, programs and organizations dedicated to the well being of young people in our state. Our initiative activity engages youth, volunteers, stakeholders and youth development professionals "to create helping relationships, to enable youths to become responsible, productive citizens."

V(G). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons(contacts) to be reached through direct and indirect contact methods

	Direct Contact Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
2011	24000	180000	250000	750000
2012	25000	190000	260000	800000
2013	26000	200000	270000	850000
2014	27000	210000	280000	900000
2015	27000	210000	285000	910000

2. (Standard Research Target) Number of Patent Applications Submitted

2011:0 2012:0 2013:0 2014:0 2015:0

3. Expected Peer Review Publications

Year	Research Target	Extension Target	Total
2011	0	8	8
2012	0	8	8
2013	0	8	8

Year	Research Target	Extension Target	Total
2014	0	8	8
2015	0	0	0

V(H). State Defined Outputs

1. Output Target

- Healthy Eating, Physical Activity and Chronic Disease Risk Reduction

2011:18000 2012:18000 2013:18000 2014:18000 2015:19000

- Preparing Youth for an Employable Future and Economic Success

2011:9000 2012:9500 2013:10000 2014:11000 2015:12000

- Building Community through Volunteerism

2011:15000 2012:15000 2013:15000 2014:15000 2015:15000

- Building Citizen Leaders

2011:11000 2012:12000 2013:13000 2014:14000 2015:15000

- Developing Life Skills

2011:20000 2012:20000 2013:20000 2014:20000 2015:21000

- K-12 Academic Achievement and Educational Success

2011:3000 2012:4000 2013:5000 2014:6000 2015:6500

V(I). State Defined Outcome

O. No.	Outcome Name
1	Youth Involved: 4-H Clubs, School Enrichment, Special Interest and Resident/Day Camps Healthy eating, physical activity and chronic disease risk reduction
2	Youth Involved: 4-H Clubs, School Enrichment, Special Interest, and Resident/Day Camps Preparing youth for an employable future and economic success
3	Youth Involved: 4-H Clubs, School Enrichment, Special Interest and Resident/Day Camps Building community through volunteerism
4	Youth Involved: 4-H Clubs, School Enrichment, Special Interest and Resident/Day Camps Building citizen leaders
5	Youth Involved: 4-H Clubs, School Enrichment, Special Interest, Resident and Day Camps Developing life skills
6	Youth Involved: 4-H Clubs, School Enrichment, Special interest, and Resident and Day Camps K-12 Academic Achievement and Educational Success

Outcome # 1

1. Outcome Target

Youth Involved: 4-H Clubs, School Enrichment, Special Interest and Resident/Day Camps Healthy eating, physical activity and chronic disease risk reduction

2. Outcome Type : Change in Action Outcome Measure

2011:18000 2012:18000 2013:18000 2014:18000 2015:18000

3. Associated Knowledge Area(s)

- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

Outcome # 2

1. Outcome Target

Youth Involved: 4-H Clubs, School Enrichment, Special Interest, and Resident/Day Camps Preparing youth for an employable future and economic success

2. Outcome Type : Change in Action Outcome Measure

2011:9000 2012:9500 2013:10000 2014:11000 2015:11500

3. Associated Knowledge Area(s)

- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

Outcome # 3

1. Outcome Target

Youth Involved: 4-H Clubs, School Enrichment, Special Interest and Resident/Day Camps Building community through volunteerism

2. Outcome Type : Change in Action Outcome Measure

2011:15000 2012:15000 2013:15000 2014:15000 2015:15500

3. Associated Knowledge Area(s)

- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

Outcome # 4

1. Outcome Target

Youth Involved: 4-H Clubs, School Enrichment, Special Interest and Resident/Day Camps Building citizen leaders

2. Outcome Type : Change in Action Outcome Measure

2011:11000 2012:12000 2013:13000 2014:14000 2015:14500

3. Associated Knowledge Area(s)

- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

Outcome # 5

1. Outcome Target

Youth Involved: 4-H Clubs, School Enrichment, Special Interest, Resident and Day Camps Developing life skills

2. Outcome Type : Change in Action Outcome Measure

2011:20000 2012:20000 2013:20000 2014:20000 2015:20500

3. Associated Knowledge Area(s)

- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

Outcome # 6

1. Outcome Target

Youth Involved: 4-H Clubs, School Enrichment, Special interest, and Resident and Day Camps K-12 Academic Achievement and Educational Success

2. Outcome Type : Change in Knowledge Outcome Measure

2011:3000 2012:4000 2013:5000 2014:6000 2015:6500

3. Associated Knowledge Area(s)

- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1890 Extension

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

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

Description

The North Carolina Developing Responsible Youth initiative drives to accomplish program impacts in the context of well planned programs. Every effort is made to avoid reduced impacts due to funding and related staffing priority changes. On those occasions when funding and/or staffing priorities of collaborating partners shift every effort is made to replace lost resources to minimize any lost program impacts.

V(K). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- Retrospective (post program)
- Before-After (before and after program)
- During (during program)
- Time series (multiple points before and after program)
- Case Study
- Comparisons between program participants (individuals, group, organizations) and non-participants

Description

Programs are evaluated for impact by objective/goal in the context of the Long Range Focus Area Team plan. These impacts are reported in three separate, related systems: Extension Service 237, the North Carolina Extension Reporting System, and the knowledge, attitude, skill, and aspiration assessments for individual programs by teams.

2. Data Collection Methods

- Sampling
- On-Site
- Structured
- Unstructured
- Case Study
- Observation
- Tests

Description

Objective/goal teams identify and collect data consistent with stated measures of progress and impact indicators for each identified sub-program. Data collection ranges from qualitative to quantitative measures for program user knowledge, behavior, attitude, skill and aspiration change to data collection to insure program structure and process validity.

V(A). Planned Program (Summary)**Program # 10****1. Name of the Planned Program**

Global Food Security and Hunger

2. Brief summary about Planned Program

North Carolina's agricultural economy has become more diverse to meet the demands of a changing population and market opportunities. Over 80 crops with an annual market value of nearly \$3 billion are produced commercially. Growers have diversified into many specialty crops including medicinal herbs, specialty melons, heirloom fruits and vegetables, various crops for the state's growing Hispanic and Oriental populations, kenaf, sea oats and wine grapes as well as organic production of various fruits and vegetables. This diversification has placed demands on the NCARS to develop sustainable programs for producing, protecting, harvesting, storing, and marketing these commodities, as well as Cooperative Extension to assure that appropriate audiences are adequately educated to use the latest developments. This planned program goal focus on research and extension programs that address needs of North Carolina growers which will allow them to remain competitive in a national and global agricultural economy and take advantage of local marketing opportunities through more efficient production practices and diversification to alternative and specialty crops. Research will focus on innovation in row crop production strategies and systems especially those used for biofuels; identification, selection, breeding, introgression and genomics designed to develop improved varieties with superior disease resistance and quality and varieties with the ability to produce high value constituents; structural, systems and quantitative biology using the tools of metabolomics and bioinformatics; value added agricultural and biological systems; horticultural and green industry production systems; and novel ways to manage pests in integrated systems. As a result of the changes in North Carolina agriculture there are an expanding number of new or inexperienced producers which creates increased education needs and opportunities for production and marketing information. Many of the projects within this program area fully integrate research and extension activities to develop and deliver educational programs to full-time, and limited-resource farmers, to agribusiness, and to the nonfarm public. Scientists in other discovery-oriented projects work in conjunction with field faculty to bring new knowledge and technology to producers and agribusinesses through development, field testing and demonstration.

In order to maintain and improve the efficiency and productivity of North Carolina and the nation's animal agriculture farmers and producers, a broad and effective plan of work has been developed. This work includes research and outreach through Cooperative Extension that includes NCA&T and NCState Universities, and engages many clientele groups including producers, agribusiness personnel and the general public. The plan of work addresses all the animal commodity groups important to North Carolina and will use any discipline necessary to address the issues of concern. New technology and knowledge will be disseminated to clientele groups both directly and indirectly through numerous methods. All participants and plans of work will be evaluated at least yearly to measure progress and success.

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

4. Program duration : Medium Term (One to 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	60%	60%	60%	
307	Animal Management Systems	40%	40%	40%	
	Total	100%	100%	100%	

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

Although North Carolina has a strong agricultural economy in order to remain competitive nationally and globally, it is necessary for producers to become more efficient in the production of traditional crops and those used in the production of biofuels and diversify their operations to incorporate alternative and specialty crops in their mix. In recent years low grain prices and pressures exerted on tobacco production have resulted in the redirection of programs to explore and examine diversification of crop production in North Carolina with alternative and specialty crops. These crops range from those that have nutraceutical and/or pharmaceutical value to crops that have potential for use as biofuels to those for ethnic markets. Each provides great opportunities as well as challenges. Additionally, economic downturns in agronomic crops other than tobacco and sensitivity to environmental concerns regarding pesticides, nutrients and agricultural wastes have increased the need for more sustainable production practices for large as well as limited resource farmers. Furthermore, consumers have become more educated and food safety, quality, and nutrition are concerns of many people. It is therefore incumbent upon our producers to supply a quality, nutritious and safe product to the market place. In order to develop competitive and sustainable agricultural systems we must explore and develop new technologies that can be used by all members of the farming community. It is also essential that we use the powers of genomics, proteomics, and metabolomics to better understand the mechanisms that underlie pest resistance, enhanced yield, drought tolerance, salt tolerance and other stresses in order to develop new varieties for traditional and specialty markets. Changes in agricultural production, changes in government policies and regulations, the increased use of genetically modified crops, and changes in demographics all challenge the NCARS and NCCE, which includes Extension educational programs supported at both NC A&T and NCSU to continue to develop and deliver educational programs to full-time, part-time and limited resource farmers, to agribusiness, and the non-farm public to ensure a productive agriculture that is competitive in the global economy and that can continue to contribute to the state's economy and the way of life of its citizens.

In today's world market, North Carolina farmers and animal producers must utilize cutting edge technology to remain the most efficient producers of wholesome and healthy food while maintaining or improving animal health and well being while also providing proper environmental stewardship for our land, water, and air resources. Over the next five years, this plan of work will involve a broad scope of players and participants including, but not necessarily limited to, NCSU and NCA&T faculty and staff, North Carolina Cooperative Extension Service personnel, farmers, agribusiness personnel, local and federal agency personnel, elected officials and the general public. Improving the efficiency of animal production will include improving reproductive performance, improvement in nutrient utilization, genetic improvement in growth and reproduction, improvements in animal management systems, decreases in incidence of animal diseases and parasites and improved management of animal and agricultural pests. While many of these improvements will be accomplished in the research setting, ultimate success will be realized when these practices are adopted by farmers and agribusiness personnel through outreach efforts. Sharing of accomplishments with all stakeholders will ensure a smooth and successful transition of new information from researchers to applied and working technology for the farmers accompanied by trust from the general public.

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

There will be continued funding at the state and federal level for applied research on sustainable production systems and basic research on the mechanisms that underlie crop productivity and pest resistance.

There will be continued funding and support for extension faculty and county faculty to deliver programs to producers and other clientele.

The agricultural economy will remain strong and provide a climate to support agricultural research and extension programs.

2. Ultimate goal(s) of this Program

{NO DATA ENTERED}

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
2011	158.0	12.0	290.0	0.0
2012	158.0	12.0	290.0	0.0
2013	158.0	12.0	290.0	0.0
2014	158.0	12.0	290.0	0.0
2015	158.0	12.0	290.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

Conduct discovery research on plants and plant systems using tools genomics, metabolomics, and proteomics

- Develop improved crop varieties using traditional and genomic approaches
- Introduce/discover new plants for food use and the green industry
- Develop systems for production of plants for biofuels
- Seek new uses for plants and plant byproducts
- Develop production systems for organic farmers

This plan of work includes broad and extensive research and extension programs. NC Agricultural Research Service scientists will conduct research projects to study methods to improve the efficiency of animal production. Research will focus on methods to improve reproductive performance, nutrient utilization, and genetic influence on growth and reproduction. Scientists will also work to improve animal management systems, decrease the incidence of animal diseases and parasites (external and internal) and improve the management of animal and agricultural pests. Species and commodity groups included in this plan of work are also very broad and include poultry such as turkeys, broiler chickens, and table-egg chickens. The plan of work also includes swine, fish such as flounder, and cattle such as beef and dairy, and numerous pests such as house flies. Research will include many phases of commodity production such as meat and dairy goats, chicken breeders (both broiler and table egg birds), commercial broilers (commercial refers to those animals produced for meat), breeder turkeys, commercial turkeys, swine breeders, commercial swine, all phases of aquaculture and beef and dairy

production. Disciplines that will be involved include nutrition, physiology, reproductive physiology, genetics, virology, bacteriology, microbiology, mycology, entomology, and many animal management systems such as grazing and forage management programs, hatchery management, feeding and drinking water systems, litter and bedding management, lighting programs, and breeder selection and management. A very important part of this plan of work is to transfer technology and knowledge to our stake-holders and clientele. Therefore, an extensive outreach effort through Cooperative Extension will be conducted by field and campus based faculty who are based on-site as well as being located across the state and based in local communities. Stake-holders and clientele will be directly engaged in many ways including workshops, conferences, discussion groups, one-on-one teaching, demonstrations, field days, short-courses, continuing education classes, and scientific meetings. Indirect methods to reach stake-holders and clientele will include long-distance education, newsletters, web sites, newspaper releases, television and radio programs, trade journals, scientific journals, and popular press articles. Participants and programs will be evaluated at least annually for success, progress, and effectiveness. Special educational programs focused on limited resource farmers will continue to be a priority for NC A&T focused Extension efforts in pasture based production systems, aquaculture and alternative breeds.

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

Extension

Direct Methods	Indirect Methods
<ul style="list-style-type: none"> ● Education Class ● Workshop ● Group Discussion ● One-on-One Intervention ● Demonstrations 	<ul style="list-style-type: none"> ● Public Service Announcement ● Billboards ● Newsletters ● TV Media Programs ● Web sites

3. Description of targeted audience

- The scientific community
- Regulatory agencies
- Agricultural chemical companies
- Agribusiness
- Commercial and limited resource farmers
- New and Part-time farmers
- Homeowners
- Consultants
- News media
- General public
- Non-governmental organizations
- Other public agency staff

V(G). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons(contacts) to be reached through direct and indirect contact methods

	Direct Contact Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
2011	512000	1450000	70400	73500
2012	517000	1450000	70400	73500

	Direct Contact Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
2013	517000	1450000	70400	73500
2014	517000	145000	70400	73500
2015	515000	140000	70400	73500

2. (Standard Research Target) Number of Patent Applications Submitted

2011:11 2012:11 2013:11 2014:11 2015:11

3. Expected Peer Review Publications

Year	Research Target	Extension Target	Total
2011	490	160	650
2012	490	160	650
2013	490	160	650
2014	490	160	650
2015	490	160	650

V(H). State Defined Outputs

1. Output Target

V(I). State Defined Outcome

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

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

Description

Changes in both competitive and noncompetitive funding will greatly influence our ability to conduct the planned research as well as deliver the results to our stakeholders. Similarly changes in policy and government regulations that affect the regulation of transgenic plants, environmental regulations, and pesticide registrations can greatly influence the direction of the research programs. The introduction of an exotic pest could greatly influence the direction of research programs. Field research could be significantly impacted by natural disasters such as hurricanes.

V(K). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- After Only (post program)
- Retrospective (post program)
- Before-After (before and after program)
- During (during program)
- Case Study
- Comparisons between program participants (individuals, group, organizations) and non-participants
- Comparisons between different groups of individuals or program participants experiencing different levels of program intensity.
- Comparison between locales where the program operates and sites without program intervention

Description

{NO DATA ENTERED}

2. Data Collection Methods

- Sampling
- Mail
- Telephone
- On-Site
- Structured
- Unstructured
- Case Study
- Observation

Description

{NO DATA ENTERED}

V(A). Planned Program (Summary)**Program # 11****1. Name of the Planned Program**

Climate Change

2. Brief summary about Planned Program

Research and Extension will enhance cooperative and collaborative efforts to protect the environment and preserve natural resources while promoting a strong and diverse agriculture. Mandates from state government to reduce odor and eliminate the use of lagoon/sprayfield waste treatment systems in confined animal operations are having a significant impact on the direction and urgency of research and outreach efforts in the environmental area. Activities associated with this program are aimed at enhancing our understanding of the physical, biological and chemical processes and interactions influencing agricultural ecosystem impacts. Interdisciplinary projects will advance knowledge of natural processes to enable development of production management and environmental protection technologies and strategies that will increase productivity; improve input efficiency; conserve natural resources; and improve and protect environmental quality. Increasing emphasis is being placed on air quality management and improvement, particularly as it relates to animal production systems.

The diverse population of North Carolina faces many economic and social challenges over the next five years. There is a great need for North Carolina citizens to better understand global economic issues as well as acquire basic knowledge about how global economic forces interact with the local economy to enhance local economic prospects. Understanding the behavior of individual decision makers is perhaps the most basic endeavor of economics. Economic system issues often involve decision makers trying to better understand production relationships, examining constraints due to limited resource availability, interpret policy restrictions, investigate and analyze prices and marketing opportunities, assess management decisions, explore alternative agricultural and environmental programs impacts, and evaluate advantages and disadvantages of new technology. It is likely that the population of North Carolina will continue to increase rapidly as additional groups recognize that North Carolina is an attractive place to live and work. Large scale in-migration is expected to fuel dramatic economic growth in many service sectors, particularly for retirement age and Latino households. Community leaders expect to preserve the high quality of the local natural environment while also providing needed services. Rural citizens will request advanced training on creating new business opportunities. Traditional clients will continue to request assistance in evaluation of more traditional agricultural and agribusiness technology. Thus, there will be an increase in the number and variety of larger scale businesses as well as an expansion in the number of home-based, smaller scale firms starting up in the state. Both segments seek to increase business and technical skills to result in an improved financial position for their household. As a result, many small and large businesses will request assistance in learning sound money management skills. Research and outreach efforts are needed to assist people in implementing programs that promote sustainable economic development, responsible management of financial assets, and make families more secure financially. Economic system analysis depends critically on an individual decision maker's response to incentives, programs, and the economic environment. Agricultural production remains an important source of farm income throughout North Carolina so programs designed to assist farmers and ranchers create added value will be important. Discontinuation of many traditional farm programs (peanuts and tobacco) have created economic income uncertainty for many rural families. We must enhance a community's capability and skills to reinvigorate its economic development opportunities.

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

4. Program duration : Short-Term (One year or less)

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	80%	80%	80%	
605	Natural Resource and Environmental Economics	20%	20%	20%	
	Total	100%	100%	100%	

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

North Carolina is a state of diverse and remarkable physical and natural resources. A strong agriculture is critical to the economy of the state. At the same time, the preservation of the environment and the health of our citizens is of paramount concern. Thus, research and outreach efforts that address these goals will have high priority. The Cooperative Extension Program at NC A&T State University assumes responsibility to provide watershed sustainability programs for small scale farmers, urban households and limited resource audiences particularly those with low literacy skills. Agricultural producers must continue to adopt new and improved farm management and marketing practices to ensure long-term economic viability. Research and Extension activities can help bridge the gap between the needs of suppliers and the wants of consumers. Today, in excess of 70% of the each consumer's food dollar is spent on marketing activities. To survive, a small business must be well managed, market effectively, and adapt quickly to a changing production environment. Of concern to farmers, handlers, and consumers are fundamental issues such as "How well does the current production and marketing system serve the individual participant?" Alternatively stated, the question could be examined from the perspective of how efficient is the current food production and marketing system? Economic efficiency exists often measured in terms of both pricing and technical expertise. Can additional value added opportunities be created by improving the competitive position of North Carolina agriculture? Farm and rural area resources differ by family, by area, and by family goals and objectives. Research and Extension efforts will focus on economic feasibility of producing and marketing a mix of value added commodities offered by local suppliers. As alternative agricultural income opportunities are examined, an expanding number of inexperienced growers and first-handlers will require additional research and outreach educational emphasis.

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**

Funding will be made available for these high priority programs and efforts will be expanded. People with low literacy skills generally lack a basic understanding of how human activities from both agricultural and urban environments influence water resources. It is assumed that research and extension priorities will not change dramatically over the next five years. We assume a personnel will be available to conduct specific research and extension activities. We assume that producers, handlers, and consumers will provide information that allows us to conduct behavioral analysis.

2. Ultimate goal(s) of this Program

{NO DATA ENTERED}

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
2011	60.0	11.0	32.0	0.0
2012	60.0	11.0	32.0	0.0
2013	60.0	11.0	32.0	0.0
2014	60.0	11.0	32.0	0.0
2015	60.0	11.0	32.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

Research activities will be focused on understanding the processes and situations that create pollution problems from agricultural production (including animal operations, field activities, and processing). With that information in hand, improved management and technological solutions will be proposed and evaluated. Technology transfer will be accomplished through demonstrations, workshops, and publications by Cooperative Extension in concert with the researchers involved.

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

Extension

Direct Methods	Indirect Methods
<ul style="list-style-type: none"> ● Education Class ● Workshop ● Group Discussion ● One-on-One Intervention ● Demonstrations 	<ul style="list-style-type: none"> ● Public Service Announcement ● Billboards ● Newsletters ● TV Media Programs ● Web sites

3. Description of targeted audience

Agricultural producers, environmental and other governmental agencies (action and regulatory), news media, the general public.

V(G). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons(contacts) to be reached through direct and indirect contact methods

	Direct Contact Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target

	Direct Contact Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
2011	78000	170500	17200	24000
2012	78000	170500	17200	24000
2013	78000	170500	17200	24000
2014	78000	170500	17200	24000
2015	78000	172500	17200	24000

2. (Standard Research Target) Number of Patent Applications Submitted

2011:2 2012:2 2013:2 2014:2 2015:2

3. Expected Peer Review Publications

Year	Research Target	Extension Target	Total
2011	78	37	115
2012	78	37	115
2013	78	37	115
2014	78	37	115
2015	78	37	115

V(H). State Defined Outputs

1. Output Target

V(I). State Defined Outcome

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

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

Description

The economy and any changes in program funding can have a significant impact on adoption or non-adoption of new innovations, BMPs and other management changes in agricultural operations. The new farm bill dictates public policy and recently enacted regulations will dictate, to a large degree, topics that are of most concern or interest to agricultural producers. Financial incentives and profitability potential will determine, to a large extent, adoption of new or existing technologies or producers bypassing any innovations that are not of interest to producers. Limited funding can result in significant impediments to being able to conduct the necessary economic and risk assessment to allow for latest informed decision making support for growers and others. Also, demographic changes can be expected to impact the availability of new or innovative marketing opportunities. We will work with county extension agents to advise them about how financial criteria can impact technology adoption. For example, construction and operation of a new fruit or vegetable freezing plant would expand marketing opportunities for low cost growers. However, opportunities would not exist for limited volume, technology-challenged producers who wish to supply frozen fruits and vegetables.

Weather-related issues can and will have a major impact on environmental research and outreach projects. The economy and any changes in program funding can also have a significant impact on adoption or non-adoption of BMPs and other management changes in agricultural operations. Public policy and regulations will dictate, to a very large degree, the topics that are of most concern or interest to the agricultural producers, which will determine the kinds of projects and programs that are of interest to those producers. Limited funding will create significant impediments in a number of these research/outreach areas, since most of these areas require time consuming and expensive data collection efforts.

V(K). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

Description

{NO DATA ENTERED}

2. Data Collection Methods

Description

{NO DATA ENTERED}

V(A). Planned Program (Summary)**Program # 12****1. Name of the Planned Program**

Sustainable Energy

2. Brief summary about Planned Program

Through research and Extension efforts, engineered solutions for food and fiber systems as well as non-food products and processes will be developed and brought to application in North Carolina. Research and Extension efforts in engineered systems will continue in the traditional agricultural areas, but recent state and national goals in environmental protection, energy recovery and conversion or use of agricultural products in conversion to fuels and other "added-value" products will spur efforts in these emerging areas. The overall program will span engineering applications from precision agriculture and sensors and controls to unit processes developed for biomass conversion and chemical extraction. Applied research and Extension efforts will continue to adapt to the changing waste management needs of the State both for agricultural and animal waste, and urban waste. Engineering will be used to mitigate pollution in watersheds through stream restoration designs. Issues in food safety will be addressed in part by engineered solutions.

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

4. Program duration : Medium Term (One to 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
111	Conservation and Efficient Use of Water	60%	60%	60%	
123	Management and Sustainability of Forest Resources	20%	20%	20%	
403	Waste Disposal, Recycling, and Reuse	20%	20%	20%	
	Total	100%	100%	100%	

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

Agricultural price supports and subsidies are declining in North Carolina. Both tobacco and peanut no longer receive a federally guaranteed price. This means that some traditional field crops and their production systems are yielding to new crops with different tillage, water management, and harvest needs in addition to different post-harvest storage and processing requirements. Engineering solutions for animal waste management are still very much at the fore and will be for the foreseeable future. The emerging biotech industry and the search for alternative fuels will lead to an increased focus on bioprocess engineering. Food safety and security concerns have increased, and engineering will be part of the solution. Pollution prevention on a watershed scale is also a priority, and there is an increasing demand for natural designs of best management practices rather than traditional designs that are more structural in nature.

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

Funding will be made available for this priority program and efforts will be expanded.

2. Ultimate goal(s) of this Program

{NO DATA ENTERED}

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
2011	19.0	1.0	12.0	0.0
2012	19.0	1.0	12.0	0.0
2013	19.0	1.0	12.0	0.0
2014	19.0	1.0	12.0	0.0
2015	19.0	1.0	12.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

Research and Extension activities will focus on applying and adapting knowledge gained from basic research to agricultural production systems and natural resource pollution prevention. Both "soft" engineering (e.g. unit process engineering) and "hard engineering" (e.g., machines, hardware and sensors and controls) will be a part of the Research and Extension activity. Technology transfer will be achieved through workshops, demonstrations and field days, and publications.

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

Extension

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

3. Description of targeted audience

The target audience will be: agricultural producers, manufacturers of agricultural machinery and food processing and storage equipment, state agencies, watershed stakeholders, and the general public.

V(G). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons(contacts) to be reached through direct and indirect contact methods

	Direct Contact Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
2011	13500	21700	2200	4650
2012	13500	21700	2200	4650
2013	13500	21700	2200	4650
2014	13500	21700	2200	4650
2015	13500	21700	2200	4650

2. (Standard Research Target) Number of Patent Applications Submitted

2011:2 2012:2 2013:2 2014:2 2015:2

3. Expected Peer Review Publications

Year	Research Target	Extension Target	Total
2011	30	12	42
2012	30	12	42
2013	30	12	42
2014	30	12	42
2015	30	12	42

V(H). State Defined Outputs

1. Output Target

V(I). State Defined Outcome

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

Weather-related issues can and will have a major impact on engineering research and outreach projects. The economy and any changes in program funding can also have a significant impact on adoption or non-adoption of structural BMPs in agricultural operations and municipalities. Public policy and regulations will dictate, to a very large degree, the topics that are of most concern or interest to the agricultural producers, companies and municipalities, which will determine the kinds of projects and programs that are of interest. Limited funding will create significant impediments in a number of these research/outreach areas, since much of the research and extension efforts and the outputs generated from these intensive efforts.

V(K). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

Description

{NO DATA ENTERED}

2. Data Collection Methods

Description

{NO DATA ENTERED}

V(A). Planned Program (Summary)**Program # 13****1. Name of the Planned Program**

Childhood Obesity

2. Brief summary about Planned Program

The Nutrition and Health program will promote optimum nutrition and health through diet and lifestyle in all North Carolinians regardless of gender, income, age, or race/ethnicity. Education programs addressing diet, healthy, and chronic disease prevention will be offered to North Carolinians of diverse income levels, age groups, genders, and/or cultural backgrounds across the state.

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

4. Program duration : Medium Term (One to 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	100%	100%	100%	
	Total	100%	100%	100%	

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

Public interest and concern about nutrition and health issues are at an all-time high. While more consumers than ever are aware of the major issues, fewer can put those concepts into everyday practice. Consumers continue to need help in using the Dietary Guidelines for Americans and MyPyramid.gov to incorporate balance, moderation and variety in their diets as well as to increase physical activity. Dietary factors are associated with five of the ten leading causes of death in N.C. (and in the U.S.), including coronary heart disease, some types of cancer, stroke, noninsulin-dependent diabetes mellitus, and atherosclerosis. Overweight and obesity have reached epidemic proportions and have become one of the most pressing health issues for our nation and state. These conditions are increasing in all age groups of all races and ethnicities. Sixty-five percent of adults in the US are overweight or obese. There are almost twice as many overweight children and three times as many overweight teens today as there were two decades ago. There is a greater prevalence for overweight and obesity in limited resource and minority youth. Action by a broad array of individuals and public and private partners is essential to reverse this trend.

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

1. Continued funding at current level 2. State and county staff to support the program 3. External grants to leverage federal, state and local funding

2. Ultimate goal(s) of this Program

North Carolinians, including limited resource individuals and families, will improve the quality of their lives through eating healthy, being active, managing resources for food security, and practicing health promoting behaviors. Research findings are expected to significantly impact the control and prevention of human diseases influenced by insects and other pests.

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
2011	35.0	2.5	17.0	0.0
2012	35.0	2.5	17.0	0.0
2013	35.0	2.5	17.0	0.0
2014	35.0	2.5	17.0	0.0
2015	35.0	2.5	17.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

The Nutrition and Health program will promote optimum nutrition and health through diet and lifestyle in all North Carolinians regardless of gender, income, age, or race/ethnicity. Education programs addressing diet, healthy, and chronic disease prevention will be offered to North Carolinians of diverse income levels, age groups, genders, and/or cultural backgrounds across the state. Programs offered will include Give Your Heart A Healthy Beat, Project Eat Right: Add to Life Program, Color Me Healthy, Moving Towards a Healthier You, Dining with Diabetes, SyberShop, Women Living Healthy - Women Living Well, and Families Eating Smart and Moving More. Programs will be held in many different settings including congregate nutrition sites, senior centers, schools, churches, government buildings, businesses, daycare centers, work sites and outdoors. Various methods will be employed including using the Internet, computers, mailed materials, media, one-on-one contact, and public meeting. Research projects will continue or be undertaken to seek scientific discoveries that will enhance the quality of living for the states' and nation's human population.

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

Extension

Direct Methods	Indirect Methods
<ul style="list-style-type: none"> • Education Class • Workshop • Group Discussion • One-on-One Intervention • Demonstrations 	<ul style="list-style-type: none"> • Public Service Announcement • Newsletters • TV Media Programs • Web sites

3. Description of targeted audience

Audiences reached included children, adults and the elderly, day care workers, hospital employees, housing authorities, Head Start, Red Cross, food banks, daycare home providers, food stamp and WIC recipients and community coalitions. No time is more important than childhood to promote healthy eating and health practices. Children in North Carolina do not consume enough fruits or vegetables and have diets that are low in fiber and higher in fat than recommended. Children in North Carolina need quality nutrition education to help positively influence their food choices. For nutrition education efforts to be effective they must also include parents and care givers. Helping families make informed decisions about their nutrition will help ensure that North Carolina's children grow to reach their full mental and physical potential. Overweight in children in North Carolina continues to rise. Treatment of overweight and obesity is difficult. Preventing overweight and obesity in children is essential to address this issue. Demographic changes in North Carolina's population continue to impact nutrition and health issues. The fastest growing age group in the state is the 65 years-and-over segment. The elderly run disproportionate risks of malnutrition and poverty as well as poor overall health status. In fact, over 85% of older adults suffer from chronic diseases and could benefit from dietary intervention. The general nutrition needs of the well elderly must be addressed; however, the needs of the elderly for prevention of malnutrition and chronic disease actually begin much earlier in life. Programs addressed to young adults and the middle-aged consumers will continue to impact the health of the population as it "ages." Women are employed in greater numbers, and many of them are among the ranks of the working poor. Over 80% of women who had school-aged children were working outside the home; 67% of women with youngest child under six years were in the labor force. For working parents with very limited resources, lack of after-school and summer programs for youth are a major concern.

V(G). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons(contacts) to be reached through direct and indirect contact methods

	Direct Contact Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
2011	100000	100000	25500	42500
2012	100000	100000	25500	42500
2013	100000	100000	25500	42500
2014	100000	100000	25500	42500
2015	100000	100000	25500	42500

2. (Standard Research Target) Number of Patent Applications Submitted

2011:2

2012:2

2013:2

2014:2

2015:2

3. Expected Peer Review Publications

Year	Research Target	Extension Target	Total
2011	4	12	16
2012	4	12	16
2013	4	12	16

Year	Research Target	Extension Target	Total
2014	4	12	16
2015	4	12	16

V(H). State Defined Outputs

1. Output Target

V(I). State Defined Outcome

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

Possible reduction in budget support for program area, reductions in state and county staff that develop and implement programs, natural disasters that impact extension's ability to deliver programs (due to budget and travel restrictions), changes in public policy or mandates that relate to program area, and increases in minority ethnic populations. Availability of adequate grant funds is also a major external factor.

V(K). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

Description

{NO DATA ENTERED}

2. Data Collection Methods

Description

{NO DATA ENTERED}

V(A). Planned Program (Summary)**Program # 14****1. Name of the Planned Program**

Food Safety

2. Brief summary about Planned Program

In North Carolina, the food industry has grown, diversified, and become a vital economic force for the state by providing jobs and adding value to raw agricultural products marketed worldwide. To continue the production of a high quality, safe, secure, and nutritious food supply and to sustain this dynamic industry requires the participation of discipline-focused basic and applied research and outreach activities that target all phases of the food production to table continuum. Faculties from multiple departments across NCSU and NC A&T will be directly engaged in activities that support the primary goals of this plan of work. Moreover, many other clientele groups will be directly or indirectly involved including producers, processors, agribusiness personnel, food retailers, and the general public. Following discovery, new food production, processing, and monitoring practices and technologies leading to new and improved value-added products will be disseminated to appropriate clientele groups using numerous educational and outreach methods. All participants and plans of work will be assessed at least yearly to assure continued progress and success.

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

4. Program duration : Medium Term (One to 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
501	New and Improved Food Processing Technologies	25%	25%	25%	
502	New and Improved Food Products	25%	25%	25%	
503	Quality Maintenance in Storing and Marketing Food Products	25%	25%	25%	
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	25%	25%	25%	
	Total	100%	100%	100%	

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

Food producers and processors will continue to strive to efficiently produce an abundant supply of high quality, safe, and nutritious supply of affordable food products. Even with the food industry's best efforts, new challenges and heightened expectations of consumers are naturally present and so will require the assistance from the land grant university system. The public's expectations of a safe and secure food system have put enormous pressure on the food industry. Since the events of 9/11/01, such contemporary issues as food biosecurity have added new meaning to food safety as the nation struggles with the awesome task of securing our food supply. To be successful, this plan of work must engage a broad group of participants including, but not limited to, NCSU and NCA&T faculty and staff, North Carolina Cooperative Extension personnel, farmers, food processors, agribusiness personnel, local, state and federal regulatory officials, elected officials, food retailers, and the general public. To assure an abundant supply of high quality, safe, secure, nutritious, and affordable food products will require the expanded utilization and improvement of raw food materials, development of new efficient processing

technologies, improved food quality, safety, security and traceability monitoring procedures, and methods for preventing, eliminating or reducing to an acceptable level microbiological and chemical safety hazards. Many of these accomplishments will be achieved in university laboratories and field trials yet the ultimate success will be based on the discoveries being translated into useful practices that are adopted by the food industry and other stakeholders. Thus, effective means of communicating research findings to appropriate stakeholder groups and training food industry personnel about appropriate handling procedures will also be identified and implemented through university-sponsored programs.

2. Scope of the Program

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

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

1. Assumptions made for the Program

The basic assumptions to satisfactorily accomplish the stated goals of this plan of work would include having adequate funding and a critical number of faculty, support staff, and graduate students to support the proposed research and outreach efforts. Other assumptions are that project participants will take advantage of opportunities as they arise, will be successful in identifying solutions to the stated problems, will effectively deliver the findings to the targeted stakeholders, that the stakeholders will put into practice the new knowledge, practices, and technologies, and that companies will be able to sustain their businesses by producing affordable food products that are of high quality, safe, secure, and nutritious.

2. Ultimate goal(s) of this Program

Foods produced in North Carolina as a result of discoveries and outreach activities described in this project will be high quality, safe and secure, and highly nutritious so as to assure the sustainability of the food industry and enhance consumer confidence.

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
2011	54.0	0.0	63.0	0.0
2012	54.0	0.0	63.0	0.0
2013	54.0	0.0	63.0	0.0
2014	54.0	0.0	63.0	0.0
2015	54.0	0.0	63.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

Multiple research and educational outreach programs will be conducted that fit under the broad umbrella of improving the quality, safety, security, and nutrition of food products produced in North Carolina. Specific research projects will identify effective nutritional control strategies for replacement of growth-promoting antibiotics for improving gut function and reducing intestinal colonization and shedding of Salmonella; assessing the incidence, populations, serotypes, genotypes, and antibiotic susceptibility of Salmonella and Campylobacter fecal isolates as a function of farm, bird age, season, management practices, and strategic processing of commercial broiler, turkey, and layer farms; assessing novel antimicrobial strategies for use in reducing foodborne pathogens and biofilm formation on food processing contact surfaces; employing the antimicrobial properties of eggshell membranes for reducing the heat resistance of foodborne pathogens; development of Salmonella-specific inhibitory nanoparticles for preventing intestinal colonization; development of alternative layer molting diets for reducing the risk of Salmonella contamination of shell eggs; characterization of Campylobacter respiratory chain genes for use in developing rational drugs for controlling infection of food animals; conduct ecotoxicological studies to identify chemical pollutant sources that contaminate aquatic human foods; development of a high hydrostatic pressure system for reducing toxigenic histamine-forming bacteria in scombroid fish and vacuum and MAP packaged fresh tuna; develop a more efficient means of producing a high-gelling protein isolate from underutilized fish species and other meat sources that could replace surimi manufacture and improve the quality, sensory and yield characteristics of new and existing muscle food products; development of a Vienna sausage product without casings via an in-tube focused microwave field heating technology; improving the texture and yield of canned/pouched Albacore tuna by controlling precook proteolysis and injection of a tuna-derived protein isolate; application of continuous flow processing of foods and biomaterials using advanced focused microwave technology; and development and testing of tools, methods and devices for rapid sterilization and production of high quality vegetable and fruit purees. A very important aspect of this plan of work is to transfer technology and knowledge to our stakeholders and clientele. Therefore, an extensive outreach effort will involve campus and field faculty located in local communities. Direct outreach efforts will include engaging stakeholders in workshops, conferences, discussion groups, one-on-one teaching, demonstrations, field trials, short courses, continuing education classes, and scientific meetings. Indirect methods will include internet sites and courses, newsletters, press releases, television and radio interviews and programming, trade journals, scientific journals and popular press articles. Participants and programs will be evaluated at least annually for success, progress, and impact.

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

Extension

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

3. Description of targeted audience

Primary food producers, food processors, foodservice operators, county extension agents, state and federal regulatory agencies, commodity associations, news media and consumers. The primary audience will be in North Carolina but will also extend to audiences in other states (state and federal agencies, local, state and federal politicians and other stakeholders).

V(G). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons(contacts) to be reached through direct and indirect contact methods

	Direct Contact Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
2011	3300	6300	125	500

	Direct Contact Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
2012	3300	6300	125	500
2013	3300	6300	125	500
2014	3300	6300	125	500
2015	3300	6300	125	500

2. (Standard Research Target) Number of Patent Applications Submitted

2011:5 2012:5 2013:5 2014:5 2015:5

3. Expected Peer Review Publications

Year	Research Target	Extension Target	Total
2011	60	12	72
2012	60	12	72
2013	60	12	72
2014	60	12	72
2015	60	12	72

V(H). State Defined Outputs

1. Output Target

V(I). State Defined Outcome

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

Anything that competes for public funding or that affects public policy can have an impact on this plan of work. Should significant external factors occur, many of the participants in this plan of work could have their funding, activities, or both re-directed. Changes in appropriations could affect funding support while changes in food regulations, public priorities, and population changes could affect specific program activities. Catastrophic events, such as hurricanes, could seriously affect funding and program activities for extended periods of time.

V(K). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

Description

{NO DATA ENTERED}

2. Data Collection Methods

Description

{NO DATA ENTERED}