

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

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I. Plan Overview

1. Brief Summary about Plan Of Work

This document outlines the 5-Year Plan of Work for FY2011-FY2015 of North Carolina Agricultural and Technical State University (NCA&T). The plan is organized around the five national goals of the National Institute Food and Agriculture/United States Department of Agriculture (NIFA/USDA) and delineates efforts to address the key agricultural issues in North Carolina.

Overall, the issues driving this 5-year Plan of Work are listed below:

Increasing health, nutrition and obesity concerns of North Carolina residents

Increasing costs of conventional energy resources emphasizing the need to develop renewable energy, bio-energy and bio-based products.

Challenges in water quality and water quantity in the state.

Demands for the use of biotechnology and biosciences to develop new or improved food and agriculturally related products.

Changes in rural economies and communities (economically stressed communities need research-based leadership training, database development to support community issues, and opportunities for entrepreneurship).

Movement away from tobacco as the primary cash crop to viable sustaining alternatives (continuing decline of tobacco, and the need for profitable alternative crops and efficient production methods).

Changes in the population composition and workforce participants (increase in Hispanics in rural areas and among the agricultural workforce has produced an increasing need and demand for population relevant information on health status and quality of life).

Increased recognition of the value and benefits of alternative medicine (nutriceuticals and functional foods as medical alternatives).

The following strategies permeate the 5-Year Plan of Work and have been refined and expanded to address the agricultural issues in North Carolina:

Increased interaction between teaching, research, and Extension has been occurring, but interaction between research and Extension has been limited. The School of Agriculture and Environmental Sciences (SAES) has implemented a strategic plan to enhance collaboration between research and Extension. This collaboration is essential to assure involvement of Extension in not only clarifying agricultural issues but also in being a partner for the delivery and use of information on completion of the research project. Specific strategies to achieve this include a required Extension component/collaboration in all Evans-Allen proposals and split appointments between research and Extension. Because of the important linkages in achieving outcomes, SAES administrators are seeking to join with the North Carolina A&T Extension and the North Carolina State University Research and Extension Combined Plan of Work beginning in 2011.

Expanded partnerships and leveraging of research funds. The School of Agriculture and Environmental Sciences actively pursues collaborative relationships with industry and national and community agencies, and other institutions of higher learning to ensure maximum impact of its research projects in terms of both application of findings and attraction of funding to support the growth and viability of the research program.

Selection of six program initiatives. The School of Agriculture and Environmental Sciences is developing a signature research, teaching and Cooperative Extension program reflected in six broad-based program initiatives. The six program initiatives are: (1) Human and Community Development; (2) Sustainable Energy; (3) Climate Change; (4) Food Safety; (5) Global Food Security and Hunger; and (6) Childhood Obesity. These initiatives build on the strengths in the School of Agriculture and Environmental Sciences and align with the top five NIFA priorities. The Initiatives also support the primary themes of the vision of NC A&T State University.

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

Year	Extension		Research	
	1862	1890	1862	1890

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

Year	Extension		Research	
	1862	1890	1862	1890
2011	0.0	0.0	0.0	22.0
2012	0.0	0.0	0.0	24.0
2013	0.0	0.0	0.0	25.0
2014	0.0	0.0	0.0	26.0
2015	0.0	0.0	0.0	28.0

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

- Combined External and Internal University External Non-University Panel

2. Brief Explanation

The research director has the primary responsibility for determining the need, priority, and scientific feasibility of the projects proposed and has a procedure for project documentation, merit review, and selection. This procedure assures that the research project proposals are scientifically sound, relevant to society's food and agricultural needs, and not duplicative of efforts undertaken elsewhere.

Prior to proposal development, alignment of the topic with the needs of the state and the direction of the six program initiatives in the School of Agriculture and Environmental Sciences is determined. Upon agreement by the department chair, the associate dean for research, and the research director, the principal investigator prepares a proposal on the topic for submission through the Evans-Allen program.

The Merit Review Process includes a review by five peer reviewers composed of persons both within and outside the university who are knowledgeable in or familiar with the area of research. The principal investigator is responsible for incorporating suggestions made by the reviewers and must give reasons for any substantive suggestions not included or addressed.

The proposal is then reviewed by the associate dean for research who determines if additional review and substantive revision is necessary. Upon acceptance by the associate dean for research and the research director, the proposal is submitted for budgetary review by the Office of Agricultural Research and then transmitted to NIFA/USDA for approval.

III. Evaluation of Multis & Joint Activities**1. How will the planned programs address the critical issues of strategic importance, including those identified by the stakeholders?**

The Agricultural Research Program (ARP) in the School of Agriculture and Environmental Sciences (SAES) at NCA&T routinely seeks feedback from agriculturally related stakeholders through a variety of formal and informal interactions and planned activities. These contacts involve all administrative levels within the SAES including administrators, researchers, staff, and students. The stakeholders include agriculturally-related industries, agencies, community groups, and county residents. The format for these activities involves service on many boards and commissions and listening sessions held across the state. Also, the SAES has a Corporate Advisory Board, a community advisory board (Strategic Planning Council), and holds three annual grassroots leadership conferences.

The decision regarding involvement of SAES research scientists in multistate, multi -institutional and integrated activities is based on whether the involvement will address the identified issues and needs in North Carolina.

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

Addressing the needs of the under-served community is a key component in the mission of the Agricultural Research Program and the university at large. By maintaining open dialogue with stakeholders, scientists and faculty representatives are able to address the needs of the under-served communities of the state of North Carolina. Additionally, persons representing under- served and under-represented individuals and communities serve on the Corporate Advisory Board and the Strategic Planning Council.

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

The outputs and outcomes of multistate, multi-institutional, multidisciplinary and integrated activities that are related to components addressed by NCA&T are described in the annual report submitted by the Agricultural Research Program to the SAES Dean and in the annual report of accomplishments to NIFA/USDA.

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

The involvement of SAES research scientists in multistate, multi -institutional, multidisciplinary and integrated activities assists in improving program effectiveness in that combining effort, especially with Extension, provides the opportunity to take the research knowledge back to the intended audiences. This enhances our potential for program impact. In terms of improving efficiency, the work load is shared among the persons involved in the collaboration, which generally improves the efficiency of collecting data, developing usable outputs, and bringing about program improvement.

IV. Stakeholder Input

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

- Targeted invitation to traditional stakeholder groups
- Targeted invitation to traditional stakeholder individuals
- Other (Grassroots Leadership Conferences)

Brief explanation.

In addition to the formal meetings involving ARP administrators and stakeholders, the program conducts several annual outreach activities as a means for gathering input from those affected by the school's research activities or who use the research results. One major event is Small Farms Week, an activity jointly sponsored by the Cooperative Extension Program and the Agricultural Research Program. During this week, farmers, commodity group representatives, and consumers attend activities both on and off campus involving Extension and research. A second major event is the Grassroots Leadership Conference. Administrators and researchers in the Agricultural Research Program participate in three conferences held annually in the three Extension programming regions of the state (eastern, central and mountains) to listen to the issues, concerns, and needs of farmers, community leaders, residents, volunteers, members of the Strategic Planning Council, Specialized Committee members and county and staff members. These grassroots conferences also assist the Agricultural Research Program in needs assessment for proposal development and program priorities. Through these activities, SAES is able to share information about research underway at the University, and receive input from those that use the research results. Other major outreach activities include field days that bring farmers, commodity groups, and consumers into direct contact with specific SAES research projects. Feedback is also sought about research and research related activities by the researchers, their research teams, and by staff associated with ARP and the University; the input is then shared within SAES and incorporated into future research activities.

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

1. Method to identify individuals and groups

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

Brief explanation.

The administrators and faculty are represented on a broad variety of local, state and national boards and organizations that provide opportunities to document issues and concerns in the state. These concerns and issues are then shared with others in the School.

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

1. Methods for collecting Stakeholder Input

- Meeting with traditional Stakeholder groups
- Survey of traditional Stakeholder groups
- Meeting with traditional Stakeholder individuals
- Survey of traditional Stakeholder individuals
- Meeting with the general public (open meeting advertised to all)
- Meeting specifically with non-traditional groups
- Other (Reading/reviewing documents by groups or about groups that describe needs)

Brief explanation.

Diverse methods are used to collect information and data on stakeholder needs. There is a proactive effort including face-to-face meetings with groups as well as reading/reviewing current documents (strategic plans, newspapers, newsletters, electronic sources, etc) that identify research needs of individuals and communities in North Carolina.

3. A statement of how the input will be considered

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

Brief explanation.

The Advisory Board and Strategic Planning Council, along with the SAES Associate Dean for Research and Research Director, meet to discuss and use this information in research project development, and for Extension planning in response to local and state needs and changes.

V. Planned Program Table of Content

S. No.	PROGRAM NAME
1	Human and Community Development
2	Sustainable Energy
3	Climate Change
4	Food Safety
5	Global Food Security and Hunger
6	Childhood Obesity

V(A). Planned Program (Summary)

Program # 1

1. Name of the Planned Program

Human and Community Development

2. Brief summary about Planned Program

This planned program involves empowering individuals, families and communities by increasing their knowledge and the skill base, and developing behaviors to address daily quality of life issues. These issues relate to financial literacy and management, parenting and youth development, aging, health, adequate nutrition, leadership development. It also relates to personal safety and changing employment prospects. In addition, this planned program involves strengthening of the community infrastructure including housing and effective leadership.

The need to address these problems is especially critical in communities with large portions of underserved populations. A substantial part of this population is located in the Black Belt counties of North Carolina. The Black Belt counties make up 15 of the 22 counties identified by the USDA's Economic Research Service as persistently poor and contain above average concentrations of African Americans. These counties include: Bertie, Bladen, Edgecombe, Halifax, Hertford, Hyde, Jones, Martin, Northampton, Perquimans, Pitt, Sampson, Tyrrell, Warren and Washington. The depressed tobacco economy, agricultural industrialization and environmental injustice have exacerbated the problems of high unemployment, poverty, and low educational attainment in these communities.

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
601	Economics of Agricultural Production and Farm Management				20%
802	Human Development and Family Well-Being				15%
803	Sociological and Technological Change Affecting Individuals, Families, and Communities				15%
804	Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures				20%
805	Community Institutions, Health, and Social Services				30%
	Total				100%

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

1. Situation and priorities

Adequate life span development of the individual is essential for building vibrant and viable communities. Well-rounded individuals are the building blocks of families, which in turn form the building blocks of communities. The Human and

Community Development Initiative in the School of Agriculture and Environmental Sciences underscore the importance of individuals, families and communities. This initiative consists of a team of teaching, research and cooperative extension faculty. Activities of the team are designed to be synergistic, complementary and supplemental to the activities of the five other initiatives in the School of Agriculture and Environmental Sciences at North Carolina A&T. Whether as a group or as individuals, members of the Human and Community Development Initiative team are involved in an array of activities in instruction, research and cooperative extension that deal with traditional and contemporary problems that confront individuals and communities. Although the program serves all communities in the state, the need to address these problems is especially critical in communities with large portions of underserved populations. A substantial part of this population is located in the Black Belt counties of North Carolina.

In addition to traditional approaches, some innovative approaches are necessary to address emerging problems related to human and community development. The Human and Community Development Initiative team is involved in finding and implementing solutions to these problems through the following focus areas:

- human development
- leadership and volunteer development
- community and economic development
- community infrastructure
- food and agricultural policy

2. Scope of the Program

- In-State Research

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

1. Assumptions made for the Program

Individuals and families seek to improve their personal, social and economic situations. Communities can improve their infrastructure and economic situation through improved leadership and with research-based information to guide them.

2. Ultimate goal(s) of this Program

The ultimate goal of this program is to conduct social-science research that will provide information which individuals, families and communities can use to improve their quality of life.

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	0.0	0.0	0.0	4.8
2012	0.0	0.0	0.0	5.3
2013	0.0	0.0	0.0	5.5
2014	0.0	0.0	0.0	5.7
2015	0.0	0.0	0.0	5.7

V(F). Planned Program (Activity)

1. Activity for the Program

Conduct research studies in the following areas: (1) to determine the challenges of new manufactured home owners in the site installation of the units and develop recommendations to the industry for improving the installation process; (2) to develop a database of community-based organizations (CBOs) by location, program priorities, capacity and method of operation to encourage collaboration among CBOs, policymakers, businesses and development agencies; and (3) to define factors that impact leadership development in rural areas that could lead to new or improved programs for developing future leaders and contributing to the sustainability of rural communities.

Present findings at professional meetings.

Publish research findings in professional journals.

Share findings with Extension educators, end users or stakeholders, and with other groups that may use the information in improving collaboration and/or methods of information delivery.

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 (DVD/CDs - electronic publication) 	<ul style="list-style-type: none"> ● Newsletters ● TV Media Programs ● Web sites ● Other 1 (Publications) ● Other 2 (Magazine)

3. Description of targeted audience

Individuals and families living in rural areas
 Underserved populations
 Rural communities
 Policy makers
 Community based organizations
 Scientific Community

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	620	479007	53	0
2012	750	502957	59	0
2013	825	528105	65	0

	Direct Contact Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
2014	900	543948	67	0
2015	925	500750	75	0

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	9	0	0
2012	9	0	0
2013	10	0	0
2014	11	0	0
2015	12	0	0

V(H). State Defined Outputs

1. Output Target

- # entries in database of community-based organizations

2011:210 2012:300 2013:300 2014:300 2015:300

- # presentations at professional meetings

2011:10 2012:11 2013:12 2014:15 2015:15

- # media occurrences

2011:15 2012:15 2013:15 2014:15 2015:15

V(I). State Defined Outcome

O. No.	Outcome Name
1	# organizations accessing and using database of community-based organizations
2	% improved leadership development in rural communities
3	# policy makers using data to change policies affecting individuals, families and communities

Outcome # 1

1. Outcome Target

organizations accessing and using database of community-based organizations

2. Outcome Type : Change in Action Outcome Measure

2011:200	2012:300	2013:310	2014:315	2015:315
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3. Associated Knowledge Area(s)

- 805 - Community Institutions, Health, and Social Services

4. Associated Institute Type(s)

- 1890 Research

Outcome # 2

1. Outcome Target

% improved leadership development in rural communities

2. Outcome Type : Change in Action Outcome Measure

2011:30	2012:40	2013:50	2014:55	2015:55
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3. Associated Knowledge Area(s)

- 803 - Sociological and Technological Change Affecting Individuals, Families, and Communities
- 805 - Community Institutions, Health, and Social Services

4. Associated Institute Type(s)

- 1890 Research

Outcome # 3

1. Outcome Target

policy makers using data to change policies affecting individuals, families and communities

2. Outcome Type : Change in Knowledge Outcome Measure

2011:8	2012:8	2013:9	2014:9	2015:9
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3. Associated Knowledge Area(s)

- 802 - Human Development and Family Well-Being
- 803 - Sociological and Technological Change Affecting Individuals, Families, and Communities
- 804 - Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures
- 805 - Community Institutions, Health, and Social Services

4. Associated Institute Type(s)

- 1890 Research

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

- Public Policy changes
- Government Regulations

Description

Regulations regarding manufactured housing may affect how the data generated will be used. Also, changes in policies regarding farmland use/loss may affect the outcomes.

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

1. Evaluation Studies Planned

- During (during program)

Description

Evaluation studies will be completed annually as part of the strategic planning and evaluation activities of the School of Agriculture and Environmental Sciences.

2. Data Collection Methods

- Mail
- Telephone
- On-Site
- Structured

Description

A variety of methods will be used to collect data regarding the outcomes. Researchers will utilize the evaluation method identified in their respective project to assess planned outcomes.

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

Sustainable Energy

2. Brief summary about Planned Program

Research focusing on using biotechnology in the development of agricultural and related products is the focus of this planned program. Agricultural production over the next 50 years must increase by 100 percent to meet world demand. Innovation is needed to increase this output and to conserve our planet's resources. Biotechnology is one of several complementary means of increasing production through higher yields, better nutritional quality, and reducing the use of chemicals for pest control causing less damage to the environment. Biotechnology is also used to conserve natural resources. The applications of biotechnology are broad, and the advantages so compelling, that virtually every industry is using the technology.

Biotechnology is enabling industries to make new or better products, often with greater speed, efficiency and flexibility. Research is needed to assist in the use of this new technological tool new century. This research will assist in guiding safe and functional catalyze growth in products derived from biotechnology. This planned program is included because of the importance of biotechnology and biodiversity to the North Carolina agricultural industry and also because the state's biotechnology industry is among the nation's three largest. The demand for biotechnologists is projected to increase dramatically in the next ten years, especially in North Carolina, where more than 300 companies are involved in biotechnology.

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				20%
201	Plant Genome, Genetics, and Genetic Mechanisms				10%
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants				10%
302	Nutrient Utilization in Animals				10%
308	Improved Animal Products (Before Harvest)				20%
311	Animal Diseases				10%
403	Waste Disposal, Recycling, and Reuse				20%
	Total				100%

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

1. Situation and priorities

Developments in agricultural/environmental biotechnology and genomics allow us to understand the molecular processes that underlie life, revolutionizing agriculture and providing new approaches towards deciphering, protecting and utilizing this planet's rich biodiversity. Thus, an unprecedented opportunity for scientific and technological development and agribusiness exists.

Agricultural/environmental biotechnology and genomics will impact all aspects of life during this millennium - wellness, human resource development/training, post-secondary education, economic development, and renewable resources development strategies. These techno-developments provide new possibilities for rural development and challenging research and educational opportunities for environmental issues. The demand for biotechnologists is projected to increase dramatically in the next ten years, especially in North Carolina, where more than 300 companies are involved in biotechnology. Biodiversity is the foundation of sustainable agriculture, crop improvement, ecosystem stability, medicines, and other essential aspects of our society, both present and future. Thus, conserving biodiversity is extremely important. The Sustainable Energy Initiative is currently structured around six areas:

- plant tissue culture and transformation
- bioremediation/phytoremediation fermentation
- mushroom biology and biotechnology
- molecular biology
- genomics
- bioinformatics

2. Scope of the Program

- In-State Research
- Multistate Research

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

1. Assumptions made for the Program

The focus on biotechnology and biodiversity will continue and expand
 Funding for studies in competitive funding will increase

2. Ultimate goal(s) of this Program

The ultimate goal is to address the issues in biotechnology and biodiversity, and to provide answers that can help industries that include agriculture or are agriculturally-related as well as producers and consumers.

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	0.0	0.0	0.0	3.2

Year	Extension		Research	
	1862	1890	1862	1890
2012	0.0	0.0	0.0	3.8
2013	0.0	0.0	0.0	4.0
2014	0.0	0.0	0.0	4.2
2015	0.0	0.0	0.0	4.7

V(F). Planned Program (Activity)

1. Activity for the Program

Conduct research studies to expand understanding of the mechanism of scours and characterize strains that cause the disease; to improve understanding of the biology of edible and medicinal exotic mushrooms to be able to identify appropriate commercial strains; to develop technologies to convert corn stalks and cheese whey into biofuels and biomaterials including hydrogen, bioethanol and succinic acid; to seek non-antibiotic additives in poultry production to control poultry diseases of *Campylobacter jejuni* and *Salmonella*; and to decipher gene expression associated with combating bacterial infection (mastitis) in cattle.

Give presentations at professional meetings and with Cooperative Extension
 Publish findings in professional journals and in the Agricultural Research Program research magazine
 Seek patents for new discoveries.

Conduct tours, workshops and other activities to share findings with Extension educators, end users or stakeholders, and with companies that may commercialize products.

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) 	<ul style="list-style-type: none"> ● Newsletters ● TV Media Programs ● Web sites ● Other 1 (Publications) ● Other 2 (DVD/CDs - electronic publication)

3. Description of targeted audience

Companies involved in biotechnology applications
 Farmers involved in producing agricultural products using biotechnology and those who are considering it
 Consumers

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	1129	479007	213	0
2012	1242	502957	234	0
2013	1300	528105	257	0
2014	1400	543948	295	0
2015	1450	550400	320	0

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

2011:2 2012:3 2013:4 2014:2 2015:2

3. Expected Peer Review Publications

Year	Research Target	Extension Target	Total
2011	9	0	0
2012	10	0	0
2013	12	0	0
2014	14	0	0
2015	14	0	0

V(H). State Defined Outputs

1. Output Target

- # presentations at professional meetings

2011:10 2012:11 2013:13 2014:15 2015:15

- # media occurrences

2011:5 2012:6 2013:7 2014:8 2015:6

V(I). State Defined Outcome

O. No.	Outcome Name
1	# of licenses of current patents
2	# breakthroughs in new uses for biomass or other agricultural co-products in North Carolina
3	# improved plant production resulting from new propagation techniques
4	# technologies to prevent/treat animal diseases

Outcome # 1

1. Outcome Target

of licenses of current patents

2. Outcome Type : Change in Condition Outcome Measure

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

3. Associated Knowledge Area(s)

- 302 - Nutrient Utilization in Animals
- 311 - Animal Diseases
- 403 - Waste Disposal, Recycling, and Reuse

4. Associated Institute Type(s)

- 1890 Research

Outcome # 2

1. Outcome Target

breakthroughs in new uses for biomass or other agricultural co-products in North Carolina

2. Outcome Type : Change in Condition Outcome Measure

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

3. Associated Knowledge Area(s)

- 133 - Pollution Prevention and Mitigation
- 302 - Nutrient Utilization in Animals
- 308 - Improved Animal Products (Before Harvest)
- 403 - Waste Disposal, Recycling, and Reuse

4. Associated Institute Type(s)

- 1890 Research

Outcome # 3

1. Outcome Target

improved plant production resulting from new propagation techniques

2. Outcome Type : Change in Knowledge Outcome Measure

2011:1 2012:1 2013:3 2014:2 2015:2

3. Associated Knowledge Area(s)

- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants

4. Associated Institute Type(s)

- 1890 Research

Outcome # 4

1. Outcome Target

technologies to prevent/treat animal diseases

2. Outcome Type : Change in Knowledge Outcome Measure

2011:1

2012:1

2013:2

2014:2

2015:1

3. Associated Knowledge Area(s)

- 311 - Animal Diseases

4. Associated Institute Type(s)

- 1890 Research

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

- Economy
- Public Policy changes
- Government Regulations

Description

North Carolina state funding has a strong focus on the development of biotechnology as an engine for economic development. Competing needs in the state may direct some monies and attention from biotechnology. This could affect how findings from our research studies would be used. Public policy could affect how biotechnology is used in our society for food and non -food products. Restrictions in this area could affect our outcomes and could shift our research focus.

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

1. Evaluation Studies Planned

- During (during program)

Description

Evaluation studies will be completed annually as part of the strategic planning and evaluation activities of the School of Agriculture and Environmental Sciences.

2. Data Collection Methods

- Mail
- Telephone
- Structured

Description

A variety of methods will be used to collect data regarding the outcomes.

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

Climate Change

2. Brief summary about Planned Program

The primary focus of this planned program is on improving soil and water quality through agricultural "best management practices" that increase soil organic matter content and reduce tillage. A primary audience for this initiative is small-scale and limited resource farmers in the state.

Good soil management practices prevent soil erosion and reduce runoff, major causes of soil degradation in North Carolina. Erosion results in (soil) sediment movement to surface waters. Sediment can come from many sources: agricultural fields, woodlands, highway road banks, construction sites, and mining operations. Sediment destroys fish spawning beds, reduces useful storage volume in reservoirs, clogs streams, makes costly filtration necessary for municipal water supplies, and can result in costly environmental, economic, and social damages. Runoff water also can transport nutrients that result in algal blooms and resulting damage to surface water biota. Runoff can carry potentially harmful nutrients, chemicals, and pesticides to surface and ground waters. Erosion of sediments and runoff can be reduced with the employment of best management practices on farms; for example grassed waterways, terraces, surface residues, improved soil structure, and increased organic matter. Also, research is needed in this natural resource area because North Carolina is a leader in the amount of animal waste resulting from the production of hogs, poultry and other animals for the food supply. This waste must be handled in an environmentally friendly, safe and adequate manner. This research is needed to address the soil and water quality but also is especially needed by small-scale and limited resource farmers in the state, who need solutions tailor made to assure economic benefits to their production processes.

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

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

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

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

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

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
102	Soil, Plant, Water, Nutrient Relationships				34%
112	Watershed Protection and Management				22%
133	Pollution Prevention and Mitigation				8%
205	Plant Management Systems				28%
403	Waste Disposal, Recycling, and Reuse				8%
	Total				100%

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

The southeastern United States and North Carolina in particular, is a rapidly growing region. Rapid growth needs to be supported by sound environmental decisions that preserve and enhance the soil and water quality of the region. The university faculty will implement research projects to investigate Best Management Practices that improve soil and water quality and mitigate environmental degradation resulting from urban and suburban development.

Past soil management practices, designed to meet the food and fiber needs of an increasing population, have taxed the resiliency of natural processes to maintain global balances of energy and matter. The degradation of our soil resources is motivating researchers and farmers to investigate and employ less input-intensive and more sustainable management systems that protect the environment and soil resources. Good soil management practices prevent soil erosion and reduce runoff, major causes of soil degradation in North Carolina.

North Carolina's livestock industry contributes a great deal to the state's economy and to farm income. Small-scale livestock production is a viable alternative for small farmers seeking to diversify cropping enterprises. Managing manure and other waste products produced by livestock in a sustainable, ecologically sensitive manner that is respectful of the community's right to a healthy, odor and pollution-free environment is a challenge for farmers. Traditional management practices for livestock waste have in some cases resulted in overloading soils with nutrients and trace materials, and in pollution of surface and groundwater. Alternatives to traditional practices for waste treatment are needed, particularly those appropriate to small and resource-limited farmers. In most cases, these farmers lack the capital to install highly technical and expensive treatment systems, as well as the expertise and training to run and maintain them.

Normally, the contribution of water pollutants from a homeowner's lawn, the grounds of a business establishment, or recreational turf, such as golf courses or athletic fields, is small. However, when millions of small inputs are added together, the impact on water quality may be significant. Population increases and construction of housing and business development make this situation acute in North Carolina. The key to minimizing this collective impact is reducing the levels of pollutants that enter the system. Best management practices in the urban environment to maintain high quality water in North Carolina watersheds include: sensible subdivision practices such as management of impervious surfaces, reduction in fertilizer and pesticide applications to the urban and suburban landscape (private properties of all sizes), proper maintenance of wastewater collection and treatment systems, and water conservation. The research will address soil and water quality issues in North Carolina. Specific focus areas include:

Agricultural Best Management Practices

Non-Agricultural Best Management Practices

2. Scope of the Program

- In-State Research

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

1. Assumptions made for the Program

Limited resource and small scale farmers are leaving the farming community rapidly.

Limited resource and small scale farmers can be assisted with practices that allow them to remain in the farming industry

Water quality and quantity will become more of an environmental and health issue nationally

Research funds for water quality and quantity will increase

2. Ultimate goal(s) of this Program

Improve the soil and water quality 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	0.0	0.0	0.0	2.3
2012	0.0	0.0	0.0	2.3
2013	0.0	0.0	0.0	2.5
2014	0.0	0.0	0.0	2.7
2015	0.0	0.0	0.0	4.0

V(F). Planned Program (Activity)

1. Activity for the Program

Conduct research studies to develop low-cost water filtration systems using nutshell-based activated carbons; to determine and measure the effectiveness of cover crops in meeting the nutrient needs in organic cropping systems; to use constructed wetlands for treatment of swine wastewater; to evaluate production of energy crops on Piedmont soil; to evaluate economic benefits of bio-fuel crops rotation for varieties of canola and sweet sorghum; and to assess how soil management practices, especially no-till approaches, affect soil quality over time.

Present findings at professional meetings.

Publish research findings in professional journals.

Share findings with Extension educators, end users or stakeholders, and with other groups that may use the information to improve the viability of small scale agricultural operations.

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) 	<ul style="list-style-type: none"> ● Newsletters ● TV Media Programs ● Web sites ● Other 1 (Publications) ● Other 2 (CDs/DVDs-Electronic Publications)

3. Description of targeted audience

Extension educators

Small-scale and limited resource farmers

Environmental groups interesting in preserving soil and water quality

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	530	479007	0	0
2012	583	502957	0	0
2013	641	528105	0	0
2014	650	543948	0	0
2015	675	550400	0	0

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	8	0	0
2012	9	0	0
2013	10	0	0
2014	10	0	0
2015	8	0	0

V(H). State Defined Outputs

1. Output Target

- # field days

2011:1 2012:1 2013:2 2014:2 2015:2

- # presentations at professional meetings

2011:7 2012:8 2013:9 2014:11 2015:12

- # workshops on improved soil and water management practices

2011:4 2012:6 2013:7 2014:7 2015:5

- # media occurrences

2011:10 2012:12 2013:12 2014:12 2015:10

V(I). State Defined Outcome

O. No.	Outcome Name
1	Number of farmers adopting improved soil and water quality management practices
2	Development of water treatment (wetlands) for small-scale farmers

Outcome # 1

1. Outcome Target

Number of farmers adopting improved soil and water quality management practices

2. Outcome Type : Change in Knowledge Outcome Measure

2011:60 2012:75 2013:80 2014:80 2015:80

3. Associated Knowledge Area(s)

- 102 - Soil, Plant, Water, Nutrient Relationships
- 112 - Watershed Protection and Management
- 133 - Pollution Prevention and Mitigation
- 403 - Waste Disposal, Recycling, and Reuse

4. Associated Institute Type(s)

- 1890 Research

Outcome # 2

1. Outcome Target

Development of water treatment (wetlands) for small-scale farmers

2. Outcome Type : Change in Condition Outcome Measure

2011:1 2012:1 2013:1 2014:1 2015:1

3. Associated Knowledge Area(s)

- 112 - Watershed Protection and Management
- 133 - Pollution Prevention and Mitigation
- 403 - Waste Disposal, Recycling, and Reuse

4. Associated Institute Type(s)

- 1890 Research

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Government Regulations

Description

The outcomes of this planned program could be seriously affected by natural disasters as well as changes in government regulations. North Carolina may change water quality regulations that could affect the farming population.

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

1. Evaluation Studies Planned

- During (during program)

Description

Evaluation studies will be completed annually as part of the strategic planning and evaluation activities of the School of Agriculture and Environmental Sciences.

2. Data Collection Methods

- Mail
- Telephone
- On-Site
- Structured

Description

A variety of methods will be used to collect data regarding the outcomes as specified in individual projects.

V(A). Planned Program (Summary)

Program # 4

1. Name of the Planned Program

Food Safety

2. Brief summary about Planned Program

The production and consumption of agricultural products are associated with significant risks of injuries and illnesses such as on-farm occupational injuries, infections from food borne pathogens, communicable disease of animal origin, nutritional deficiencies and environmental and health disparities. Underserved communities are disproportionately impacted by many of these preventable injuries and illnesses. The cumulative cost of these agricultural health and safety problems poses considerable financial burden on the nation's economy due to economic losses resulting from health care cost, loss of productivity, and decreased overall quality of life.

Many chronic diseases, including heart disease, stroke, hypertension, diabetes and some forms of cancer, are related nutritional factors. The prevalence of some of these chronic conditions is higher among certain ethnic minority groups. Several demographic and nutrition-related shifts are occurring in North Carolina and the nation. Of particular interest is the shift toward increased emphasis on functional foods and nutraceuticals as ways to address the health of the population. Research is needed to address the health and safety needs of agricultural communities and consumers of agricultural products with special attention to underserved communities.

Processing of agricultural commodities grown in NC yields considerable amount of by-products such as peanut skins/shells, sweet potato peels, grape seeds and skin. These by-products have little economic value but could benefit from new value added technologies. These low-value by-products are suspected to contain significant amount of bioactive compounds including phenolics (e.g., procyanidins, resveratrol), and carotenoids. Characterization of the bioactivity of products derived from these agricultural by-products is an important step to ascertain their potential value-added utilization in health promoting products and functional applications.

In recent years, a significant emphasis has been placed on fighting cancer through the combination of chemotherapy (using cytotoxic agents) and naturally occurring chemopreventive agents. Plant extracts have been used as chemopreventive agents because their mechanistic actions on cancer cells are different from cytotoxic agents and some clinical work has found their combination to be effective. Pokeweed roots and rosehip fruits have shown potent antiproliferative activity against colon, breast, and cervical cancer cells in vitro.

Researchers at NCA&TSU are: isolating, identifying and characterizing bioactive compounds from peanuts skin, sweet potato peels/flesh, and wine grapes skins /seeds; developing value-added products incorporating bioactive compounds from select extracts and evaluating them for consumer acceptability; exploring industry partnerships for commercial utilization of prototyped products incorporating bioactive extracts; and they are isolating the most active fractions from pokeweed and rose hip that show strong antiproliferative and apoptosis activity against breast, colon, and cervical cancer cells.

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
204	Plant Product Quality and Utility (Preharvest)				10%
502	New and Improved Food Products				30%
503	Quality Maintenance in Storing and Marketing Food Products				10%
701	Nutrient Composition of Food				18%
703	Nutrition Education and Behavior				12%
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins				20%
	Total				100%

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

1. Situation and priorities

Agriculture is a multibillion-dollar industry that is vital to the US economy, in general and to the state of North Carolina in particular. In fact, agriculture is a \$71 billion a year industry that employs 20 percent of North Carolina's work force. However, farming is second only to mining as the most dangerous occupation in the United States.

There are community and environmental health concerns associated with these rural occupations that not only impact the well being of rural residents but also the consumers of agricultural products as well. These include health care access and delivery, environmental contaminants (water and air quality), food safety, nutrition, and more recently biosecurity issues. Among these issues, food safety and nutrition represent major sources of preventable diseases that cost the nation billions of dollars each year. An estimated 76 million people contract food borne illnesses each year in the US, accounting for 325,000 hospitalizations and more than 5,000 deaths. This translates into a yearly cost of all food borne diseases in the US of \$30 billion in direct medical expenses and lost productivity.

To address these health and safety challenges in North Carolina and find solutions specifically tailored to the needs of underserved communities, the planned program of " Food Safety" has the following thrust areas:

- nutrition
- food safety
- zoonotic diseases
- nutraceutical, functional, and organic foods
- minority and environmental health

2. Scope of the Program

- In-State Research

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

1. Assumptions made for the Program

Nutrition-related health problems will continue and research can help reduce these problems.

Food safety concerns can be adequately addressed through use of research-based technologies
 Funding will continue and strengthen in the area of agromedicine, nutrition and food safety

2. Ultimate goal(s) of this Program

The ultimate goals of this planned program are the following:
 Reduce nutritionally-related health problems through improved nutrition
 Reduce food borne illness through improved food safety
 Address problems related to safety in the production of agricultural and agriculturally-related products
 Develop new food products or improve existing food products

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	0.0	0.0	0.0	5.7
2012	0.0	0.0	0.0	6.2
2013	0.0	0.0	0.0	6.4
2014	0.0	0.0	0.0	6.6
2015	0.0	0.0	0.0	7.1

V(F). Planned Program (Activity)

1. Activity for the Program

Conduct studies to determine functional food ingredients from selected North Carolina agricultural by-products, to evaluate select plant extracts as potential food preservatives and anticarcinogens, and to enhance the microbiological quality of probiotic supplements.

Present findings at professional meetings and with Cooperative Extension
 Publish research findings in professional journals and Agricultural Research Program's research magazine.
 Seek patents for new discoveries.

Conduct tours, workshops and other activities to share findings with Extension educators, end users or stakeholders, and with companies that may commercialize products.

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

Extension

Direct Methods	Indirect Methods
----------------	------------------

- Education Class
- Workshop
- Group Discussion
- One-on-One Intervention
- Demonstrations
- Other 1 (Tours)
- Other 2 (Internet/Web)

- Newsletters
- TV Media Programs
- Other 1 (Publications)
- Other 2 (Internet/Web)

3. Description of targeted audience

The target audience for this research is the following:

- Extension educators for use in programs and outreach activities
- Companies involved in health and nutrition related products and/or food safety
- Consumers

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	1185	479007	84	0
2012	1304	502957	92	0
2013	1434	528105	101	0
2014	1505	543948	110	0
2015	1525	545400	115	0

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

2011:1 2012:2 2013:2 2014:1 2015:1

3. Expected Peer Review Publications

Year	Research Target	Extension Target	Total
2011	9	0	0
2012	10	0	0
2013	12	0	0
2014	14	0	0
2015	14	0	0

V(H). State Defined Outputs

1. Output Target

- # presentations at professional meetings

2011:8

2012:9

2013:12

2014:15

2015:15

- # media occurrences

2011:10

2012:11

2013:13

2014:13

2015:10

V(I). State Defined Outcome

O. No.	Outcome Name
1	# of companies purchasing licenses for food and food safety related patents
2	# breakthroughs in new technologies to address food safety
3	# new food products that industry can manufacture to improve health

Outcome # 1

1. Outcome Target

of companies purchasing licenses for food and food safety related patents

2. Outcome Type : Change in Action Outcome Measure

2011:1 2012:1 2013:1 2014:1 2015:1

3. Associated Knowledge Area(s)

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

4. Associated Institute Type(s)

- 1890 Research

Outcome # 2

1. Outcome Target

breakthroughs in new technologies to address food safety

2. Outcome Type : Change in Action Outcome Measure

2011:3 2012:4 2013:5 2014:2 2015:2

3. Associated Knowledge Area(s)

- 502 - New and Improved Food Products
- 503 - Quality Maintenance in Storing and Marketing Food Products
- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

4. Associated Institute Type(s)

- 1890 Research

Outcome # 3

1. Outcome Target

new food products that industry can manufacture to improve health

2. Outcome Type : Change in Knowledge Outcome Measure

2011:1 2012:1 2013:1 2014:1 2015:1

3. Associated Knowledge Area(s)

- 204 - Plant Product Quality and Utility (Preharvest)
- 502 - New and Improved Food Products
- 701 - Nutrient Composition of Food

4. Associated Institute Type(s)

- 1890 Research

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

- Populations changes (immigration, new cultural groupings, etc.)
- Other (National public health problem)

Description

A number of external factors could affect the outcomes of this planned program, including, but not limited to: a national health problem that may change the direction of the research or a special problem with food safety related to terrorist activity.

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

1. Evaluation Studies Planned

- During (during program)

Description

Evaluation studies will be completed annually as part of the strategic planning and evaluation activities of the School of Agriculture and Environmental Sciences.

2. Data Collection Methods

- Mail
- Telephone
- Structured

Description

A variety of methods will be used to collect data regarding the outcomes as specified in the individual projects.

V(A). Planned Program (Summary)

Program # 5

1. Name of the Planned Program

Global Food Security and Hunger

2. Brief summary about Planned Program

North Carolina A&T State University is in the unique position to address issues related to small scale, limited resource, and African-American farmers in North Carolina. This program in Small Scale Agriculture will, among other objectives, enhance coordination of research, outreach and extension efforts, technical assistance, and other educational efforts to enhance the potential of socially disadvantaged farmers and ranchers to successfully acquire, own, operate, and retain farms and ranches, and to participate equitably in the full range of agricultural programs available to all farmers. A major thrust of the agricultural research program is to work in tandem with Extension to locate and determine the marketing parameters of alternatives to tobacco farming. Small scale farmers are particularly affected by the tobacco decline and are the primary focus of the research/Extension efforts. The focus is to assist tobacco farmers in transitioning from growing tobacco to the production and successful marketing of niche and alternative products such as upscale pork, exotic mushrooms, wine vineyards, cut flowers, and fuel crops. Rural communities and the state economic situation will benefit from this planned program.

Additional efforts will focus on conducting research on issues and factors related to increasing domestic and international markets for food and agricultural related products produced by North Carolina small scale farmers and businesses. This planned research is crucial to our efforts to help small scale farmers and businesses in North Carolina develop markets for their food and related agricultural products. Finding improved ways to deliver technical assistance will enhance the impact of NCA&T's planned program and improve the economic status of small farmers and businesses. Also, as a result, the economic status of rural communities where these entities are located will be enhanced.

Specifically, this planned program has three major research thrusts : (1) economic development research used to deliver technical assistance to small scale farmers and rural businesses in leveraging capital to enhance economic growth; (2) trade policy research conducted to assess policy implications relative to domestic, regional and world trade and U. S. competitiveness; and (3) applied international marketing research completed to gain greater understanding of traditional markets in Europe, North America and Asia and identifying U. S. niche market opportunities especially for small farmers and businesses.

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
202	Plant Genetic Resources				10%
205	Plant Management Systems				15%
401	Structures, Facilities, and General Purpose Farm Supplies				20%
604	Marketing and Distribution Practices				15%
610	Domestic Policy Analysis				20%
611	Foreign Policy and Programs				20%
	Total				100%

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

The most widely used description of the structure of agriculture is based on the statistic of gross farm sales. The USDA Economic Research Service labels three-fourths of the nation's farms that have annual gross sales under \$50,000 as "non-commercial" farms, meaning they do not generate enough sales to be commercially viable on their own.

In 2007, the last year for which data are available, there were 53,713 farms in North Carolina with 8.5 million acres in farming. Included in these totals were 1,563 Black (non-white) farmers on 147,470 acres. This compares with 287,000 total farms on 186 million acres in 1950. In that year, 76,000 Black farmers farmed 3.1 million acres. In the last 25 years, the population of Black farmers has decreased by approximately 50%. Only 5% of principle farm enterprises reported by Black farmers in 2007 could be classified as specialty crops (fruits, vegetables, nurseries) enterprises.

In North Carolina, small scale farmers and businesses need to expand the markets for their food and agricultural and related products in order to be economically viable. While expanding domestic markets is the primary focus, international opportunities also provide a potential market for farmers products. Small farmers and businesses need information, training and assistance to be effective players in the international arena. Research is needed to identify better ways to assist farmers and also to understand the implications and impact of both domestic and international policies on their involvement in the international markets.

North Carolina A&T State University researchers are addressing these needs with efforts focused on the development of specialty crop and livestock enterprises appropriate to direct marketing opportunities with urban consumers, utilization of sustainable farm management that foster the economic and social sustainability of low-income and socially disadvantaged farmers. These efforts will address issues identified previously that have led to and continue to encourage the departure of the Black farmer and the limited-resource farmer from the rural North Carolina agricultural landscape. North Carolina A&T State University will develop teaching, research, and extension programs to preserve small farms as viable components of American agriculture.

The SAES has a core of faculty with a wealth of experience to undertake research to address developing country food security, economic growth, and poverty alleviation and environmental sustainability problems. Ongoing projects include the integrated pest management project being undertaken in Mali, and two research projects studying potential to improve market access for U.S. livestock and pork in the newly liberalized Chinese market.

The L.C. Cooper, Jr. International Trade Center is well equipped to conduct domestic and international trade policy research. Emphasis and studies will focus on the following areas:

Small-scale Agricultural Enterprises and Production Practices

Alternative Marketing Strategies
 Economic development research
 Trade policy research
 Applied international marketing research

2. Scope of the Program

- In-State Research

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

1. Assumptions made for the Program

A continued drop in small-farm operations will continue in North Carolina
 Research on factors affecting small farms can reduce loss in small farm operations
 The effects of loss of tobacco production will intensify especially for small farmers
 Export of food and agricultural products and related products will increase.
 Small farmers and businesses have food and agricultural products that can be successfully marketed internationally
 Small farmers and businesses can be effective players in the international arena when they have knowledge on procedures and policies that affect their involvement
 Funding will be available for research on understanding and increasing international markets for small farm and business operations.

2. Ultimate goal(s) of this Program

The ultimate goal is to: (1) provide research and support systems to allow small farmers to continue in farming; and (2) increase the competitiveness of small farmers and businesses in North Carolina to market their food and agricultural products and related products.

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	0.0	0.0	0.0	3.8
2012	0.0	0.0	0.0	4.0
2013	0.0	0.0	0.0	4.2
2014	0.0	0.0	0.0	4.2
2015	0.0	0.0	0.0	6.3

V(F). Planned Program (Activity)

1. Activity for the Program

Conduct studies that will: (1) promote rural business growth by defining opportunities for rural entrepreneurs and connecting these entrepreneurs with small-scale agricultural enterprises, existing rural businesses and prospective

entrepreneurs; (2) determine viable alternatives to tobacco for small scale producers including floriculture production in tobacco greenhouses, outdoor and indoor mushroom production, and specialty melons and other crops; (3) develop improved methods for washing green leafy vegetables for use by small scale farmers; (4) identify factors influencing successful small farm operations in North Carolina that can be developed into a protocol for evaluating the predicted success of small farm operations; (5) examine economic assessment of changes in trade agreements, bioterrorism threats and economic fuel requirements on various industry sectors; (6) identify new domestic and international markets for North Carolina producers with particular emphasis on small scale operations.

Present findings at professional meetings.

Publish research findings in professional journals.

Share findings with Extension educators, end users or stakeholders, and with other groups that may use the information to improve the viability of small scale agricultural operations and groups that will help small scale producers find markets for their products.

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) 	<ul style="list-style-type: none"> ● Newsletters ● TV Media Programs ● Web sites ● Other 1 (Publications) ● Other 2 (CDs/DVDs-Electronic Publications)

3. Description of targeted audience

The targeted audiences include the scientific community, the general public, small-scale farmers and operations, producers in small scale agriculture, small businesses in North Carolina, rural community businesses, traditionally underserved populations and communities.

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	1142	479007	0	0
2012	1256	502957	0	0
2013	1382	528105	0	0
2014	1450	543948	0	0
2015	1475	545400	0	0

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	7	0	0
2012	8	0	0
2013	10	0	0
2014	11	0	0
2015	16	0	0

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

- # presentations at professional meetings

2011:9**2012:10****2013:12****2014:14****2015:20**

- # media occurrences

2011:10**2012:11****2013:12****2014:12****2015:16**

V(I). State Defined Outcome

O. No.	Outcome Name
1	Increase in number of producers/growers of alternative crops/enterprises
2	# of small farmers and businesses trained and becoming involved in export of their products
3	% of increased income by farmers and businesses served by the International Trade Center
4	% of stakeholders who use the information and policy research in their decision making

Outcome # 1

1. Outcome Target

Increase in number of producers/growers of alternative crops/enterprises

2. Outcome Type : Change in Knowledge Outcome Measure

2011:300 2012:350 2013:370 2014:380 2015:375

3. Associated Knowledge Area(s)

- 202 - Plant Genetic Resources
- 205 - Plant Management Systems

4. Associated Institute Type(s)

- 1890 Research

Outcome # 2

1. Outcome Target

of small farmers and businesses trained and becoming involved in export of their products

2. Outcome Type : Change in Condition Outcome Measure

2011:5 2012:6 2013:6 2014:6 2015:6

3. Associated Knowledge Area(s)

- 610 - Domestic Policy Analysis
- 611 - Foreign Policy and Programs

4. Associated Institute Type(s)

- 1890 Research

Outcome # 3

1. Outcome Target

% of increased income by farmers and businesses served by the International Trade Center

2. Outcome Type : Change in Condition Outcome Measure

2011:10 2012:15 2013:10 2014:10 2015:10

3. Associated Knowledge Area(s)

- 610 - Domestic Policy Analysis

4. Associated Institute Type(s)

- 1890 Research

Outcome # 4

1. Outcome Target

% of stakeholders who use the information and policy research in their decision making

2. Outcome Type : Change in Condition Outcome Measure

2011:25

2012:25

2013:25

2014:25

2015:25

3. Associated Knowledge Area(s)

- 610 - Domestic Policy Analysis
- 611 - Foreign Policy and Programs

4. Associated Institute Type(s)

- 1890 Research

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Public Policy changes
- Government Regulations
- Other (negotiations at the WTO)

Description

External factors that could impact the outcomes of this planned program include natural disasters like hurricanes that could bring immediate ruin and needed assistance to small farmers. Public policy and government changes could impact the outcomes relative to export of US products and the current state, national and global economic crisis. Shifting of program resources may be necessary to address the changes.

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

1. Evaluation Studies Planned

- During (during program)

Description

Evaluation studies will be completed annually as part of the strategic planning and evaluation activities of the School of Agriculture and Environmental Sciences.

2. Data Collection Methods

- Whole population
- Mail
- Telephone
- On-Site
- Structured
- Case Study

- Observation

Description

A variety of methods will be used to collect data regarding the outcomes as specified in the respective projects.

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

Childhood Obesity

2. Brief summary about Planned Program

Obesity has become a disease of an epidemic proportion and with profound negative health, psychological, and social consequences for both children and adults in the United States. The occurrence of obesity may increase the risk for certain health problems including coronary heart disease, Type II diabetes, stroke, hypertension, arthritis and several forms of cancer. Obesity can also affect virtually every organ system in a child's body, including their well being (poor self esteem, depression) and brain (increased pressure, headaches and double vision); lungs (sleep apnea, asthma, shortness of breath); heart and blood vessels (high cholesterol, high blood pressure, blood clotting); digestive tract (acid reflux, constipation, gallstones); bones and joints (dislocated growth plate) and early puberty. Most disturbing is the fact that obese children are almost six times more likely than children with healthy weights to have an impaired quality of life; equal to that of children undergoing treatment of cancer. Interventions are needed to address the alarming concern, especially since obesity also affects the state's economy (health care).

Physical inactivity and unhealthy eating together are the second leading preventable cause of death in North Carolina. The cost of obesity associated with N.C. youth was estimated to be approximately \$16 million per year. Interventions are needed to address the alarming concern, especially since obesity also affects the state's economy (health care).

This planned program will recruit students enrolled in rural North Carolina after school programs to participate in educational programs designed to increase participants' knowledge on healthy eating and living, thus leading to reduced incidents of overweight and obesity. Participants will be given nutritional science and food preparation education utilizing the services of a registered dietitian, a graduate student in food and nutritional sciences, and Cooperative Extension personnel. Educational sessions topics are (a) designed from a tested curriculum that has been validated for adolescents, and (b) focused discussions from students in similar after school programs. The lessons will include topics on healthy nutrition choices, Type II diabetes, weight management, food and culture, family health history, and physical activity and fitness. Development and implementation of a social media forum for participant will be performed by undergraduate students.

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
703	Nutrition Education and Behavior				50%
724	Healthy Lifestyle				40%
806	Youth Development				10%
	Total				100%

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

Among children in North Carolina between ages 10 to 17 years, 20 percent were overweight whereas 14 percent were obese (North Carolina Department of Health and Human Services, 2009). Moreover, data from NHANES surveys (1976 - 1980 and 2003 - 2006) show that the prevalence of obesity has increased for children aged 2- 5 years from 5 percent to 12.4 percent; for those aged 6 - 11 years from 6.5 percent to 17 percent; and for those aged 12 - 19 years, from 5 percent to 17.6 percent. Obesity rates have continued to rise in North Carolina, with the 5th highest national rate of obese children.

2. Scope of the Program

- In-State Research

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

Failure to address the diet and health problems faced by youth will lead to continual increase in the number of overweight and obese youth.

Employing educational formats/mediums that resonates with youth will increase their participation rate.

Structured programs, educational and activity interventions using social media forums will be significant factors in reducing and/or preventing disproportionately high rates of overweight, unhealthy food consumption and inactivity among adolescent participating in after school programs.(i.e. Facebook, Wikis,software modules, surveymonkey.com, webcams) and youth peers can be used to successfully educate youth about best practices for improving their nutrition habits while reducing obesity.

Social networking technologies (i.e. software modules, surveymonkey.com, webcams) and youth peers (i.e. Facebook, Wikis) can be used to successfully educate youth about best practices for improving their nutrition habits while reducing obesity.

2. Ultimate goal(s) of this Program

The ultimate goal of this program is to develop and implement an education program that will reduce the incidence of childhood obesity 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

Year	Extension		Research	
	1862	1890	1862	1890
2011	0.0	0.0	0.0	0.5
2012	0.0	0.0	0.0	0.5
2013	0.0	0.0	0.0	1.0
2014	0.0	0.0	0.0	1.5
2015	0.0	0.0	0.0	1.5

V(F). Planned Program (Activity)

1. Activity for the Program

1. Determine the level of overweight, obesity, and inactivity among targeted populations.
2. Develop educational and programmatic interventions tailored for youth.
3. Develop surveys to test the knowledge, attitude, and behaviors related to nutrition and physical activity of program participants.

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"> ● Newsletters ● TV Media Programs ● Web sites ● Other 1 (Face book) ● Other 2 (webcams)

3. Description of targeted audience

The targeted audiences include youth, middle school teachers and counselor, parents of middle school children, Extension educators, 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	100	100000	150	50000
2012	150	150000	200	60000
2013	200	175000	250	65000
2014	250	175000	300	70000

	Direct Contact Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
2015	300	225000	400	70000

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	2	0	0
2012	4	0	0
2013	5	0	0
2014	5	0	0
2015	5	0	0

V(H). State Defined Outputs

1. Output Target

- # presentations at professional meetings

2011:3 2012:4 2013:5 2014:6 2015:6

- # media occurrences

2011:2 2012:2 2013:3 2014:3 2015:5

V(I). State Defined Outcome

O. No.	Outcome Name
1	Number of youth participating in educational intervention programs and activities
2	Development of educational intervention programs and physical activities for youth
3	% youth showing improved knowledge of nutrition and appropriate physical activities
4	% youth employing healthy eating and physical activities in their lives

Outcome # 1

1. Outcome Target

Number of youth participating in educational intervention programs and activities

2. Outcome Type : Change in Knowledge Outcome Measure

2011:50 2012:75 2013:100 2014:125 2015:150

3. Associated Knowledge Area(s)

- 703 - Nutrition Education and Behavior
- 724 - Healthy Lifestyle
- 806 - Youth Development

4. Associated Institute Type(s)

- 1890 Research

Outcome # 2

1. Outcome Target

Development of educational intervention programs and physical activities for youth

2. Outcome Type : Change in Knowledge Outcome Measure

2011:3 2012:3 2013:6 2014:6 2015:6

3. Associated Knowledge Area(s)

- 703 - Nutrition Education and Behavior
- 724 - Healthy Lifestyle
- 806 - Youth Development

4. Associated Institute Type(s)

- 1890 Research

Outcome # 3

1. Outcome Target

% youth showing improved knowledge of nutrition and appropriate physical activities

2. Outcome Type : Change in Knowledge Outcome Measure

2011:75 2012:80 2013:85 2014:85 2015:90

3. Associated Knowledge Area(s)

- 703 - Nutrition Education and Behavior

4. Associated Institute Type(s)

- 1890 Research

Outcome # 4

1. Outcome Target

% youth employing healthy eating and physical activities in their lives

2. Outcome Type : Change in Knowledge Outcome Measure

2011:40	2012:50	2013:60	2014:70	2015:75
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3. Associated Knowledge Area(s)

- 703 - Nutrition Education and Behavior
- 724 - Healthy Lifestyle
- 806 - Youth Development

4. Associated Institute Type(s)

- 1890 Research

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

- Economy
- Public Policy changes
- Government Regulations

Description

Government regulations and public policy can impact what is done and how we propose to implement the project. The economy will impact the level at which the participants can implement the proposed changes in their lives.

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

1. Evaluation Studies Planned

- Before-After (before and after program)
- During (during program)

Description

An assessment will be conducted before the program to determine the participants' level of knowledge on the proposed topics. Assessments will also be performed during the study and after to determine level of change in participants' knowledge and application.

2. Data Collection Methods

- On-Site
- Structured
- Observation

- Other (Surveymonkey.com)

Description

A variety of measures will be used to collect data regarding the outcomes.