2008 North Carolina A&T State University Research Plan of Work

I. Plan Overview

1. Brief Summary about Plan Of Work

This document outlines the 5-Year Plan of Work for FY2008-FY2012 of North Carolina Agricultural and Technical State University (NCA&T). The plan is organized around the five national goals of the Cooperative State Research, Education, and Extension Service (CSREES/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 cost 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 (increases 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 (neutriceuticals 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:
1. Increased interaction between research and Extension. 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 2008.

2. 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.

3. 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) Agromedicine, Nutrition and Food Safety, (2) Biotechnology and Biodiversity, (3) Human and Community Development, (4) International Trade and Development, (5) Small Scale Agriculture, and (6) Soil and Water Quality. These initiatives build on the strengths in the School and Environmental Sciences and align with the five CSREES goals. 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
2008	0.0	0.0	0.0	13.5
2009	0.0	0.0	0.0	15.0
2010	0.0	0.0	0.0	16.5
2011	0.0	0.0	0.0	17.0
2012	0.0	0.0	0.0	18.0

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 CSREES/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 involve service on many boards and commissions and listening sessions held across the state. Also, the SAES has a Corporate Advisory Board and a community advisory board (Strategic Planning Council).
The decision regarding involvement of SAES research scientists in multistate, multi-institutuional and integrated activies 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 State(s)?

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 repressentatives 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 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 CSREES/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 efforts, 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

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

- Open Listening Sessions
- Use External Focus Groups

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

- Survey of traditional Stakeholder groups
- Meeting with the general public (open meeting advertised to all)
- Meeting with traditional Stakeholder groups
- Survey of traditional Stakeholder individuals
- Meeting specifically with non-traditional groups

Brief explanation

A major source of feedback from stakeholders comes from the extensive interaction and networking by individual faculty members. Faculty members serve on agricultural interests boards, are members of agricultural related organizations, and attend meetings of groups that have a stake in the activities and projects of the Agricultural Research Program.

3. A statement of how the input will be considered

- To Identify Emerging Issues
- Redirect Research Programs

Brief explanation.

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

V. Planned Program Table of Content

S. NO.	PROGRAM NAME
1	Agromedicine, Nutrition and Food Safety
2	Biotechnology and Biodiversity
3	Human and Community Development
4	International Trade and Development
5	Small Scale Agriculture
6	Soil and Water Quality

V(A). Planned Program (Summary)

1. Name of the Planned Program

Agromedicine, Nutrition and 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 foodborne 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 due to 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 to 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. One is the increased rate of growth of the Hispanic population in the nation and particularly in the state. Another societal shift is increased attention being given to functional foods and nutriceuticals as ways to address the health of the population.

Research is needed to address the health and safety needs of agricultural forestry and fisheries communities and consumers of agricultural products with special attention to underserved 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 : No

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

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

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 $68.3 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.

The cost of health care in North Carolina from farm-related injuries exceeds $200 million annually. Forestry and commercial fishing are nearly as dangerous as farming.

There are also 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 foodborne 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 foodborne diseases in the US of $30 billion in direct medical expenses and lost productivity. Nutrition related health problems (e.g., obesity, diabetes, cardiovascular diseases) are major public

health concerns especially with recent data showing a third of the US population classified as obese. The National Institute of Health estimates cost of obesity at $99.2 billion/year with obesity related diseases such as diabetes, heart diseases, osteoarthritis, cancer, and hypertension costing the nation over $187 billion/year.
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 “Agromedicine, Nutrition and Food Safety” has the following thrust areas:
nutrition
occupational health and safety
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 safey concerns can be adequately addressed through use of research-based technologies
Funding will continue and strengthen in the area of agromedicine, nutrion and food safety

2. Ultimate goal(s) of this Program

The ultimate goals goals of this planned program are the following:
Reduce nutritionally-related health problems through improved nutrition
Reduce foodborne illnesss 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
2008	0.0	0.0	0.0	5.5
2009	0.0	0.0	0.0	5.7
2010	0.0	0.0	0.0	6.0
2011	0.0	0.0	0.0	6.5
2012	0.0	0.0	0.0	7.0

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, to enhance the microbiological quality of probiotic supplements, to determine food knowledge and practices among different population subgroups and develop targeted and focused intervention methods for maximum effect, and to improve healthy eating and physical activity of Hispanic women.
Present findings at professional meetings and with Coopeative 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 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**
• Group Discussion • Other 1 (Tours) • Education Class • One-on-One Intervention • Demonstrations • Workshop	• Other 1 (Publications) • Newsletters • TV Media Programs

3. Description of targeted audience

The target audience for this research are 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 Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
2008	890	235000	63	0
2009	979	242050	69	0
2010	1077	249312	76	0
2011	1185	256791	84	0
2012	1304	263495	92	0

2. (Standard Research Target) Number of Patents

Expected Patents

2008 : 1 **2009 :** 1 **2010 :** 1 **2011 :** 1 **2012 :** 2

3. Expected Peer Review Publications

Year	Research Target	Extension Target
2008	5	0
2009	6	0
2010	6	0
2011	7	0
2012	8	0

V(H). State Defined Outputs

1. Output Target

- # new patents in food and food-related discoveries

2008 : 1	**2009 :** 1	**2010 :** 1	**2011 :** 1	**2012 :** 2

- # presentations at professional meetings

2008 : 5	**2009 :** 6	**2010 :** 7	**2011 :** 8	**2012 :** 9

- # articles published in research and other professional journals

2008 : 5	**2009 :** 6	**2010 :** 6	**2011 :** 7	**2012 :** 8

- # media occurrences

2008 : 6	**2009 :** 8	**2010 :** 9	**2011 :** 10	**2012 :** 11

V(I). State Defined Outcome

1. Outcome Target

hispanic women adopting healthy nutrition and exercise practices

2. Outcome Type : Change in Knowledge Outcome Measure

2008 : 30	**2009 :** 60	**2010 :** 90	**2011 :** 120	**2012 :** 150

3. Associated Knowledge Area(s)

- 703 - Nutrition Education and Behavior

1. Outcome Target

# of companies purchasing licenses for food and food safety related patents

2. Outcome Type : Change in Action Outcome Measure

2008 : 1	**2009 :** 1	**2010 :** 1	**2011 :** 1	**2012 :** 0

3. Associated Knowledge Area(s)

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

1. Outcome Target

# of adolescents reducing their overweight and obesity status

2. Outcome Type : Change in Action Outcome Measure

2008 : 50	**2009 :** 50	**2010 :** 200	**2011 :** 200	**2012 :** 0

3. Associated Knowledge Area(s)

- 703 - Nutrition Education and Behavior

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

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

Description

A number of extenal factors could affect the outcomes of this planned program. One is that there could be a national health problem that may change the direction of the research to address the concern. One may be a special problem with food safety related to terriorist activity. Also a major change would be a more dramatic increase in obesity in the Hispanic 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. A position for an evaluation specialist is currently being filled. The person in this position will assist in developing the annual measures of the planned program.

2. Data Collection Methods

- Telephone
- Structured
- Mail

Description

A variety of methods will be used to collect data regarding the outcomes. These methods will be more fully developed when a new evaluation position is added to the staff.

V(A). Planned Program (Summary)

1. Name of the Planned Program

Biotechnology and Biodiversity

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. Current agricultural production is not meeting the demand for food worldwide made by the increasing population. 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 function 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 200 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 : No

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

- 133 20% Pollution Prevention and Mitigation
- 201 10% Plant Genome, Genetics, and Genetic Mechanisms
- 203 10% Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 302 10% Nutrient Utilization in Animals
- 308 20% Improved Animal Products (Before Harvest)
- 311 10% Animal Diseases
- 403 20% Waste Disposal, Recycling, and Reuse

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 in the new 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 200 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 Biotechnology and Biodiversity Program Initiative is currently structured around eight areas:
plant tissue culture and transformation
bioremediation/phytoremediation
fermentation

food safety
mushroom biology and biotechnology
molecular biology
genomics
bioinformatics

2. Scope of the Program

- Multistate Research
- In-State 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
2008	0.0	0.0	0.0	2.0
2009	0.0	0.0	0.0	2.3
2010	0.0	0.0	0.0	2.5
2011	0.0	0.0	0.0	2.5
2012	0.0	0.0	0.0	3.0

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, bioethnol 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 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**
• Group Discussion • One-on-One Intervention • Other 1 (Tours) • Demonstrations • Education Class • Workshop	• Other 1 (Publications) • TV Media Programs • Newsletters

3. Description of targeted audience

Companies involved in biotechnology applications
Farmers involved in producting 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 Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
2008	848	235000	160	0
2009	932	242050	176	0
2010	1026	249312	194	0
2011	1129	256791	213	0
2012	1242	264495	234	0

2. (Standard Research Target) Number of Patents

Expected Patents

2008 :0 **2009 :**0 **2010 :** 0 **2011 :**0 **2012 :**0

3. Expected Peer Review Publications

Year	Research Target	Extension Target
2008	5	0
2009	7	0
2010	8	0
2011	9	0
2012	10	0

V(H). State Defined Outputs

1. Output Target

- # articles published in research and other professional journals

2008 : 5 **2009 :** 7 **2010 :** 8 **2011 :** 9 **2012 :** 10

- # presentations at professional meetings

2008 : 7 **2009 :** 8 **2010 :** 9 **2011 :** 10 **2012 :** 11

- # media occurrences

2008 : 2 **2009 :** 3 **2010 :** 4 **2011 :** 5 **2012 :** 6

V(I). State Defined Outcome

1. Outcome Target

of licenses of current patents

2. Outcome Type : Change in Condition Outcome Measure

2008 : 0 **2009 :** 1 **2010 :** 1 **2011 :** 2 **2012 :** 2

3. Associated Knowledge Area(s)

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

1. Outcome Target

of filings for intellectual property

2. Outcome Type : Change in Condition Outcome Measure

2008 : 1 **2009 :** 1 **2010 :** 1 **2011 :** 1 **2012 :** 1

3. Associated Knowledge Area(s)

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

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 affects how biotechnology is used in our society for food and non-food products. Restrictions in this areas 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 activies of the School of Agriculture and Environmental Sciences. An evaluation position is currently being filled. The person in this position will assist in developing the annual measures.

2. Data Collection Methods

- Telephone
- Mail
- Structured

Description

A variety of methods will be used to collect data regarding the outcomes. These methods will be more fully developed as a result of a new evaluation position be added to the staff.

V(A). Planned Program (Summary)

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 the knowledge and the skill base, and developing behaviors to address the 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 these 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 : No

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

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

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 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. 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 situation.
· Communities can improve their infrastructure and economic situation through improved leadership and with research-based information to guide decisions

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 the 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
2008	0.0	0.0	0.0	3.5
2009	0.0	0.0	0.0	4.0
2010	0.0	0.0	0.0	4.5
2011	0.0	0.0	0.0	4.5
2012	0.0	0.0	0.0	5.0

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 to 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 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**
• Group Discussion • One-on-One Intervention • Demonstrations • Other 1 (Tours) • Education Class • Workshop	• Other 1 (Publications) • TV Media Programs • Other 2 (Magazine) • Newsletters

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 Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
2008	466	235000	40	0
2009	513	242050	44	0
2010	564	249312	48	0
2011	620	256791	53	0
2012	750	264495	59	0

2. (Standard Research Target) Number of Patents

Expected Patents

2008 :0 **2009 :**0 **2010 :** 0 **2011 :**0 **2012 :**0

3. Expected Peer Review Publications

Year	Research Target	Extension Target
2008	5	0
2009	5	0
2010	7	0
2011	9	0
2012	9	0

V(H). State Defined Outputs

1. Output Target

- # Entries in database of community-based organizations

2008 :59 **2009 :**110 **2010 :** 150 **2011 :**210 **2012 :**310

- # presentations at professional meetings

2008 :5 **2009 :**8 **2010 :** 8 **2011 :**10 **2012 :**11

- # media occurrences

2008 :10 **2009 :**12 **2010 :** 14 **2011 :**15 **2012 :**15

- # published articles in research and other professional journals

2008 :5 **2009 :**5 **2010 :** 7 **2011 :**9 **2012 :**9

V(I). State Defined Outcome

1. Outcome Target

organizations accessing and using database of community-based organizations

2. Outcome Type : Change in Action Outcome Measure

2008 :0 **2009 :** 100 **2010 :** 100 **2011 :**200 **2012 :** 300

3. Associated Knowledge Area(s)

- 805 - Community Institutions, Health, and Social Services

1. Outcome Target

Revision of Community Voices curricula by Extension specialists and others to include data from research study

2. Outcome Type : Change in Action Outcome Measure

2008 :0 **2009 :** 1 **2010 :** 0 **2011 :**0 **2012 :** 0

3. Associated Knowledge Area(s)

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

1. Outcome Target

policy makers using data to reduce installation and other challenges faced by manufactured home owners.

2. Outcome Type : Change in Knowledge Outcome Measure

2008 :5 **2009 :** 6 **2010 :** 7 **2011 :**8 **2012 :** 8

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

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

- Government Regulations
- Public Policy changes

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. An evaluation position is currently being filled. The person in this position will assist in developing the annual measures of the six planned programs.

2. Data Collection Methods

- Mail
- Structured
- Telephone
- On-Site

Description

A variety of methods will be used to collect data regarding the outcomes. These methods will be more fully developed as a result of a new evaluation position be added to the staff.

V(A). Planned Program (Summary)

1. Name of the Planned Program

International Trade and Development

2. Brief summary about Planned Program

This planned program of International Trade and Development focuses on conducting research on issues and factors related to increasing domestic and international markets for food and agricultural and related products produced by North Carolina small scale farmers and businesses. This planned research is crucial to be able to assist small scale farmers and businesses in North Carolina develop markets for their food and agricultural products and related 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; (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 : 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 : No

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

- 601 10% Economics of Agricultural Production and Farm Management
- 602 10% Business Management, Finance, and Taxation
- 603 15% Market Economics
- 604 15% Marketing and Distribution Practices
- 605 10% Natural Resource and Environmental Economics
- 610 20% Domestic Policy Analysis
- 611 20% Foreign Policy and Programs

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

1. Situation and priorities

In North Carolina, the issue is that small scale farmers and businesses need to expand the markets for their food and agricultural and related products in order to be economically viable. Expanding domestic markets is the primary focus but international opportunities provide a potential market for these products. However, small farmers and businesses need information, training and assistance to be effective players in the international arena. Research is needed to understand 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.

The School of Agriculture and Environmental Sciences (SAES) has developed this initiative on International Trade and Development to help disadvantaged rural communities fuel economic growth by strengthening their domestic markets and by becoming players in the global marketplace. The International Trade Center has been established to lead these efforts.

The SAES has the scope of disciplinary expertise and wealth of experience to undertake research to address developing country food security, economic growth, and poverty alleviation and environmental sustainability problems. On going 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 International Trade Center is well equipped to conduct domestic and international trade policy research, especially in tracking emerging issues that influence the competitiveness of North Carolina and U.S. agriculture. It also conducts applied international business marketing research to afford better understanding of both traditional and non-traditional/emerging markets abroad. Lessons learned from the research conducted on farm cooperatives contribute to improving farm profitability and enhancing the quality of life for rural-based limited-resource farm communities.

Emphasis and studies will focus on the following areas:
· economic development research
· trade policy research
· applied international marketing research

2. Scope of the Program

- In-State Research
- Multistate Research

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

1. Assumptions made for the Program

· 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 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
2008	0.0	0.0	0.0	1.3
2009	0.0	0.0	0.0	1.5
2010	0.0	0.0	0.0	2.0
2011	0.0	0.0	0.0	2.0
2012	0.0	0.0	0.0	3.0

V(F). Planned Program (Activity)

1. Activity for the Program

· Conduct research studies concerning the economic assessment of changes in trade agreements, bioterrorism threats and economic fuel requirements on various industry sectors, and seeking 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 and with other groups that assist 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**
• Group Discussion • Workshop • Other 1 (Tours) • Education Class • One-on-One Intervention • Demonstrations	• Newsletters • TV Media Programs • Other 1 (Publications)

3. Description of targeted audience

The target audience includes the producers in small scale agriculture and small businesses 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 Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
2008	148	235000	0	0
2009	163	242050	0	0
2010	179	249312	0	0
2011	197	256791	0	0
2012	217	263495	0	0

2. (Standard Research Target) Number of Patents

Expected Patents

2008 :0 **2009 :**0 **2010 :** 0 **2011 :**0 **2012 :**0

3. Expected Peer Review Publications

Year	Research Target	Extension Target
2008	3	0
2009	4	0
2010	4	0
2011	4	0
2012	6	0

V(H). State Defined Outputs

1. Output Target

- # articles published in research and other professional journals

2008 : 3	**2009 :** 4	**2010 :** 4	**2011 :** 4	**2012 :** 6

- # presentations at professional meetings

2008 : 5	**2009 :** 5	**2010 :** 5	**2011 :** 5	**2012 :** 6

- # media occurrences

2008 : 6	**2009 :** 8	**2010 :** 9	**2011 :** 10	**2012 :** 12

- # of research projects focusing on developing regional and international markets for NC products

2008 : 3	**2009 :** 4	**2010 :** 5	**2011 :** 6	**2012 :** 6

V(I). State Defined Outcome

1. Outcome Target

# of different NC products exported

2. Outcome Type : Change in Action Outcome Measure

2008 : 3	**2009 :** 4	**2010 :** 4	**2011 :** 5	**2012 :** 6

3. Associated Knowledge Area(s)

- 611 - Foreign Policy and Programs

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

2008 : 3	**2009 :** 4	**2010 :** 5	**2011 :** 5	**2012 :** 6

3. Associated Knowledge Area(s)

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

1. Outcome Target

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

2. Outcome Type : Change in Condition Outcome Measure

2008 : 5	**2009 :** 10	**2010 :** 10	**2011 :** 10	**2012 :** 15

3. Associated Knowledge Area(s)

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

1. Outcome Target

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

2. Outcome Type : Change in Condition Outcome Measure

2008 :	2009 :	2010 :	2011 :	2012 :
0	25	25	25	25

3. Associated Knowledge Area(s)

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

1. Outcome Target

# of new regional or national markets found for NC products

2. Outcome Type : Change in Knowledge Outcome Measure

2008 :	2009 :	2010 :	2011 :	2012 :
10	11	12	12	13

3. Associated Knowledge Area(s)

- 610 - Domestic Policy Analysis

1. Outcome Target

# of small farmers and businesses trained in finding regional and national markets for their products

2. Outcome Type : Change in Knowledge Outcome Measure

2008 :	2009 :	2010 :	2011 :	2012 :
20	25	30	40	50

3. Associated Knowledge Area(s)

- 610 - Domestic Policy Analysis

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

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

Description

Public policy and government regulations regarding export of US products could greatly impact the outcomes. Outcomes could be increased by positive policy and regulation and greatly dwarfed by negative decisions.

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

1. Evaluation Studies Planned

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

Description

Evaluation studies will be completed annually as part of the strategic planning and evaluation activities of the School of Agriculture and Environmental Sciences. An evaluation specialist position is currently being filled. This person will assist in developing the annual measures of the planned program.

2. Data Collection Methods

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

Description

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

V(A). Planned Program (Summary)

1. Name of the Planned Program

Small Scale Agriculture

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, 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 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. Also, attention will focus on opportunities for value-added agriculture especially on using swine waste for energy resources.

This planned program is included because of the research needs of the state regarding small farms and the movement away from the traditional crop of tobacco. Rural communities and the state economic situation will benefit from this planned program.

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

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

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

6. Expending other than formula funds or state-matching funds : No

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

- 202 13% Plant Genetic Resources
- 203 17% Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 205 17% Plant Management Systems
- 206 8% Basic Plant Biology
- 308 13% Improved Animal Products (Before Harvest)
- 401 32% Structures, Facilities, and General Purpose Farm Supplies

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. Even for farmers in the next highest sales class, from $50,000 gross sales to $250,000 gross sales, where 86 percent of these farmers count farming as their primary occupation, the average return on equity is negative.

In 2002, the last year for which data are available, there were 53,930 farms in North Carolina with 9.1 million acres in farming. Included in these totals were 1,797 Black (non-white) farmers on 155,000 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 2002 could be classified as specialty crops (fruits, vegetables, nurseries) enterprises.

North Carolina A&T State University is in the unique position to address issues related to small-scale, limited resource,

African-American farmers in North Carolina in the state as it is in line with the mandate of the Cooperative Extension Program. Consequently, the principal focus of the Small-Scale Agriculture planned program in the School of Agriculture and Environmental Sciences will be the small-scale, limited-resource and African-American farmers in North Carolina.

Efforts include the use of 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, and the development of innovative delivery- systems that improve the effectiveness of current and visionary programs contemplated by the initiative. These efforts will address those 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. Small-scale agriculture will strengthen American society. Specific focus areas include:

· Small-scale Agricultural Enterprises and Production Practices
· Alternative Marketing Strategies

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

2. Ultimate goal(s) of this Program

The ultimate goal is to provide research and supportive systems to allow small farmers to continue in farming.

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
2008	0.0	0.0	0.0	2.4
2009	0.0	0.0	0.0	2.5
2010	0.0	0.0	0.0	2.5
2011	0.0	0.0	0.0	3.0
2012	0.0	0.0	0.0	3.5

V(F). Planned Program (Activity)

1. Activity for the Program

· Conduct studies in the following areas: (1) to 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) to 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) to seek improved methods for washing green leafy vegetables for use especially by small scale farmers, and (4) to 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.
· Present findings at professional meetings.

· Publish research findings in professional journals.
· Share findings with Extension educators 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**
• Demonstrations • Education Class • Group Discussion • One-on-One Intervention • Workshop • Other 1 (Tours)	• Other 1 (Publications) • Newsletters • TV Media Programs

3. Description of targeted audience

The targeted audiences include the scientific community, the general public, small-scale farmers and operations, rural community businesses, tradtionally 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 Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
2008	858	235000	0	0
2009	943	242050	0	0
2010	1038	249312	0	0
2011	1142	256791	0	0
2012	1256	263495	0	0

2. (Standard Research Target) Number of Patents

Expected Patents

2008 :0 **2009 :**0 **2010 :** 0 **2011 :**0 **2012 :**0

3. Expected Peer Review Publications

Year	Research Target	Extension Target
2008	5	0
2009	6	0
2010	6	0
2011	7	0
2012	8	0

V(H). State Defined Outputs

1. Output Target

- # presentations at professional meetings

2008 : 7	**2009 :** 7	**2010 :** 8	**2011 :** 9	**2012 :** 10

- # articles published in research and other professional journals

2008 : 5	**2009 :** 6	**2010 :** 6	**2011 :** 7	**2012 :** 8

- # media occurrences

2008 : 7	**2009 :** 9	**2010 :** 9	**2011 :** 10	**2012 :** 11

V(I). State Defined Outcome

1. Outcome Target

mushroom growers

2. Outcome Type : Change in Knowledge Outcome Measure

2008 : 200	**2009 :** 240	**2010 :** 250	**2011 :** 300	**2012 :** 350

3. Associated Knowledge Area(s)

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

1. Outcome Target

lbs and sales in mushroom production

2. Outcome Type : Change in Knowledge Outcome Measure

2008 : 2500	**2009 :** 3000	**2010 :** 4000	**2011 :** 5000	**2012 :** 6000

3. Associated Knowledge Area(s)

- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 205 - Plant Management Systems
- 401 - Structures, Facilities, and General Purpose Farm Supplies

1. Outcome Target

% farmers in groups indicating increase in knowledge about small scale operations

2. Outcome Type : Change in Knowledge Outcome Measure

2008 : 50	**2009 :** 75	**2010 :** 75	**2011 :** 80	**2012 :** 85

3. Associated Knowledge Area(s)

- 205 - Plant Management Systems
- 401 - Structures, Facilities, and General Purpose Farm Supplies

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

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

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 of this planned program. Shifting of program resources may be neccessary 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. A position for an evaluation specialist is currently being filed. The person in this position will assist in developing the annual measures of the planned program.

2. Data Collection Methods

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

Description

A variety of methods will be used to collect data regarding the outcomes. These methods will be more fully developed when a new evaluation position is added to the staff.

V(A). Planned Program (Summary)

1. Name of the Planned Program

Soil and Water Quality

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 then five years)

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

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

6. Expending other than formula funds or state-matching funds : No

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

- 102 34% Soil, Plant, Water, Nutrient Relationships
- 112 22% Watershed Protection and Management
- 133 8% Pollution Prevention and Mitigation
- 205 28% Plant Management Systems
- 403 8% Waste Disposal, Recycling, and Reuse

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 expenses 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
2008	0.0	0.0	0.0	2.0
2009	0.0	0.0	0.0	2.5
2010	0.0	0.0	0.0	3.0
2011	0.0	0.0	0.0	3.0
2012	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, 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 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**
• Education Class • Other 1 (Tours) • Workshop • One-on-One Intervention • Group Discussion • Demonstrations	• Other 1 (Publications) • Newsletters • TV Media Programs

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 Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
2008	398	235000	0	0
2009	437	242050	0	0
2010	482	249312	0	0
2011	530	256791	0	0
2012	583	263495	0	0

2. (Standard Research Target) Number of Patents

Expected Patents

2008 :0 **2009 :**0 **2010 :**0 **2011 :**0 **2012 :**0

3. Expected Peer Review Publications

Year	Research Target	Extension Target
2008	5	0
2009	5	0
2010	5	0
2011	6	0
2012	6	0

V(H). State Defined Outputs

1. Output Target

- # field days

2008 : 1 **2009 :** 1 **2010 :** 1 **2011 :** 1 **2012 :** 1

- # presentations at professional meetings

2008 : 4 **2009 :** 5 **2010 :** 6 **2011 :** 7 **2012 :** 8

- # articles published in research and other professional journals

2008 : 5 **2009 :** 5 **2010 :** 5 **2011 :** 6 **2012 :** 6

- # workshops on improved soil and water management practices

2008 : 3 **2009 :** 4 **2010 :** 4 **2011 :** 4 **2012 :** 6

- # media occurrences

2008 : 5 **2009 :** 6 **2010 :** 8 **2011 :** 10 **2012 :** 12

V(I). State Defined Outcome

1. Outcome Target

% farmers adopting improved soil and water quality management practices

2. Outcome Type : Change in Knowledge Outcome Measure

2008 : 50 **2009 :** 50 **2010 :** 60 **2011 :** 60 **2012 :** 75

3. Associated Knowledge Area(s)

- 102 - Soil, Plant, Water, Nutrient Relationships

1. Outcome Target

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

2. Outcome Type : Change in Condition Outcome Measure

2008 : 0 **2009 :** 0 **2010 :** 0 **2011 :** 1 **2012 :** 1

3. Associated Knowledge Area(s)

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

- 403 - Waste Disposal, Recycling, and Reuse

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 qualtiy 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 and Environmental Sciences. A position for an evaluation specialist is currently being filed. The person in this position will assist in developing the annual measures of the planned program.

2. Data Collection Methods

- Mail
- Telephone
- On-Site
- Structured

Description

A variety of methods will be used to collect data regarding the outcomes. These methods will be more fully developed when a new evaluation position is added to the staff.