

**FY 2004
Annual Report of Accomplishments and Results**



**Partnerships Unit
Cooperative State Research, Education, and Extension Service
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Submitted by

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**North Carolina Agricultural and Technical State University
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AGRICULTURAL RESEARCH PROGRAM

I. PLANNED PROGRAMS

A. Goal 1: An agricultural system that is highly competitive in the global economy

1. Overview

Agricultural research at North Carolina A&T State University (NCA&TSU) is directed towards three objectives: (a) increasing production and added value of North Carolina farm products, (b) assisting small tobacco farmers in shifting to alternative crop and animal production, and (c) developing uses of agricultural by-products. Highlights of the year are listed below; specific accomplishments/impacts are reported under the Key Theme section of Small Farm Viability.

- A major thrust has been developing a program for increasing pork exports to China by small-scale pork producers. North Carolina ranks second to Iowa in the nation in pork production and while large producers benefit from aggressive export programs to China, small-scale producers should also have access to this market. The University's International Trade Center is developing a plan for establishing the infrastructure that is necessary for small farmers successfully to enter this export market. This work is being done in tandem with campus Cooperative Extension personnel. Building on its success in marketing North Carolina wine abroad, the University's International Trade Center is developing a model for that will promote the sale and distribution of products like pork from small producers to expand the export of North Carolina farm products to international markets.
- The move from tobacco production to alternative crops and other sources of farm income remains a major challenge for many small farmers in North Carolina. The challenge is basically two-fold: (1) what crop(s) or other income producing activities can replace the income produced by tobacco, and (2) what do these farmers need to do to make a successful transition to growing or raising these alternative products? Researchers and Extension personnel are working together to identify income producing agriculture crops and products, as well as efficient ways to successfully transition into the production of these alternatives. Collaborative efforts have successfully promoted the entry into specialty pork and mushroom production, and research has expanded into the use of tobacco transplant greenhouses for specialty cut flower production. Specialty melons also are being studied as alternative crops.
- NCA&TSU has signed a partnership agreement with a North Carolina restaurant owner ""to develop a plan to market a ""signature"" barbecue from pork produced by

small-scale hog farmers in North Carolina. This partnership agreement will provide a reliable market for the pasture pork produced by small farmers.

- As part of the S-287 regional committee, NCA&TSU researchers are working to improve the competitiveness of Southern agriculture by providing data to policy makers concerning the impact of the Free Trade Agreement of the Americas (FTAA). The regional committee has developed a report to advise policy makers on issues of competitiveness for US agriculture with an emphasis on issues important to the South. The committee plans to continue to follow-up with policy makers on its recommendations to determine how to improve its advocacy for benefiting Southern agriculture.
- Research continues on developing a production protocol for the American chestnut in North Carolina that will improve resistance to blight. The American chestnut was once a cash crop for US Appalachia farmers. Today, the US imports \$20-40 million of chestnuts annually. The focus of this research is to determine if there are molecular changes that can be made to make the American chestnut more resistant to blight. Successful development will result in increasing chestnut plantings in the US and restoring a cash crop to NC farmers.
- A small-farms field day focused on alternative crops for small farmers. The field day was jointly sponsored by the Research and Extension Programs. Results from the evaluation forms completed by the attendees indicate that over 91 percent of them found the demonstrations useful and plan to implement them on their farms.

Total Expenditures: Section 1445 and State Matching Funds = \$1,491,317

FTE's: 9

2. Key Theme – Small Farm Viability

Description:

Small farm viability has many challenges in North Carolina. Historic legislation passed by the US Congress last year ended the 70-year old tobacco program. The significant decline of tobacco as a major crop is leading many small farmers to seek alternative crop and animal production to remain profitably in the farming business. Experts think the tobacco buyout may reduce the number of tobacco farmers in North Carolina by 75 percent. To assist with this transition, researchers have combined efforts with Extension personnel to identify, test, and demonstrate viable alternatives. Success in moving small farmers into specialty pork and mushroom production is reported in this section.

Accomplishment/IMPACT:

- Specialty Pork. This project has involved the development of “upscale pork” which is currently purchased by restaurants in North Carolina and New York City. The specialty pork project began in 2002 to assist limited resource farmers

with finding an alternative source of income to tobacco by producing pork for niche markets. Since 2002, project farmers have sold over \$1,000,000 of market hogs to Niman Ranch Pork Company, a major market for these hogs. The 42 farmers currently participating in the project were formerly tobacco farmers and 92 percent were limited resource farmers.

The project has been a joint effort of researchers and Extension personnel. Researchers have conducted sensory surveys to evaluate niche-market pork versus corporate lines, as well as laboratory assessments of the quality and characteristics of meats. Extension field personnel have provided technical support and assistance to the farmers in helping them achieve a profitable return on their investment. The farmers reported an average return on each hog ranging from \$1,056 to \$1,496. With an average of 14 sows per farm, the project farmers generated between \$14,784 to \$20,977 net profit per farm. This project is also serving as a model for programs being implemented by other state agricultural universities including Florida A&M and Virginia State.

- **Mushroom Production.** This project is providing a viable alternative to tobacco for small farmers in NC. The specialty mushroom, mostly shiitake (*Lentinula edodes*), is in high demand by upscale restaurants in the state. This is a joint project between research and Extension faculty in which researchers are providing the substrate for and the expertise in the mushroom production while Extension personnel are trained to assist with workshops and individual grower support. Since the inception, the number of small farm growers has increased from 20 in 2002 to 221 in 2005. University personnel is supporting this industry growth through providing technical support, field support, and seeking a successful marketing and production process in the state. This includes leadership in a statewide mushroom growers association as well as determining the infrastructure for successful marketing strategies. Forty-five mushroom growers surveyed reported an average production of 89.4 pounds in 2004 for which they received sales of an average of \$10.00 per pound. Overall, this translates into average sales of \$894.00 per mushroom producer.

Source of Federal Funds: Section 1445, Cooperative Extension, State Matching Funds

Scope of Impact: State Specific

C. Goal 3: A healthy, well-nourished population

1. Overview

Adequate nutrition is essential for human health and a number of chronic diseases are related to nutritional factors. Medicinal plants and nutraceuticals are being studied for ways to address the health of the population.

Total Expenditures: Section 1445 and State Matching Funds = \$1,130,156

FTE's: 7

2. Key Theme – Medicinal Plants and Nutraceuticals

Description. Industries that are focusing on providing products to assist with human health are seeking ways to offer new products and to improve their existing products. NCA&TSU researchers are working with industry and sharing findings through appropriate technology transfer procedures.

Accomplishments/Impacts

- Probiotic bacteria are friendly, beneficial and healthy bacteria used in the production of yogurt, various fermented milk products, and dietary supplements. However, the effectiveness of these beneficial bacteria is reduced when they are subjected to stressful environments during processing, manufacturing and ingestion by humans. Researchers at NCA&TSU have identified and patented a technology to improve the viability and survival of probiotics throughout the production to “delivery to the shelf” stages. This technology has improved the industry’s ability to retain the health promoting benefits of these bacteria in commonly consumed food products. Jarrow Formulas, Inc. bought part of the patent and licenses on other parts of the patent, and applied them to the production line of dietary supplements to improve product quality and stability.

Source of Federal Funds: Section 1445; State Matching Funds

Scope of Impact: State specific

II. Stakeholder Input Process.

A. Sources of Gathering Input

The Agricultural Research Program in the School of Agriculture and Environmental Sciences (SAES) at North Carolina Agricultural and Technical State University 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.

Agricultural Research Program

The Dean of SAES serves as the Research Director and is responsible for ensuring that the School maintains routine contact with consumers of the Agricultural Research Program (ARP), which includes members of industry, alumni, community groups, and county residents. For the past two years the Dean has served on the board of the NC Agribusiness Council, the trade industry for agribusiness in the state. Agribusiness is the largest industry in North Carolina and produces almost \$60 billion annually. The Dean also serves on a number

of other agriculturally-related boards including the following; Agricultural Advancement Consortium (a consortium appointed by the Governor to develop a plan to revitalize farming in the state and to advocate for legislation at the state and national levels; North Carolina Agribusiness Council, North Carolina Agromedicine Institute, North Carolina Coalition of Rural and Farm Families, Inc., North Carolina Community Development Initiative, Inc., NC Farm Bureau Federation, and the Rural Advancement Fund International (RAFI).

The Dean also annually conducts information-gathering forums throughout the state to gain input on the programs and actions of the School. In these information-sharing forums, the School's research initiatives are presented and input is sought about the value and impact of these projects. This input is used as important sources for refining and developing the program initiatives of the School.

SAES Advisory Council

An Advisory Council to SAES is composed of representatives from agriculturally-related companies as well as other stakeholders with related interests. The Council meets annually to discuss the direction and achievements of the School's academic efforts with students but also responds to the research and Cooperative Extension activities. The group's input is used by the associate deans and department chairs and is included in the strategic planning of the SAES major program initiatives.

Annual Stakeholder Events

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. Through this activity, 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

Cooperative Extension Services Environmental Scan Data

North Carolina A&T's Cooperative Extension Program, in collaboration with the Cooperative Extension Service at NC State University, annually conducts an environmental scan which involves surveying county residents, advisory groups, commodity groups, government agencies, volunteers and other groups about agriculturally related issues. The respondents provide information regarding needs assessment, issues, trends and emerging issues. This information is shared with the Dean/Research Director as well as with associate deans, department chairs, and individual faculty as related to their responsibilities and interests. This information is also shared with the Strategic Planning Council, an advisory

board to the campus (NC A&T) Cooperative Extension Service group. This advisory board is composed of community leaders, agribusiness persons, teaching faculty, Cooperative Extension team members and individuals representing non-governmental organizations. The Strategic Planning Council along with the SAES Associate Dean for Research meet to discuss this information and use it in research project reviews and for Extension planning in response to local and state needs and changes.

Department Level Advisory Boards

Two departments in SAES have main primary advisory boards, while some departments have additional advisory boards for departmental initiatives. These boards are composed of representatives from industry, public instruction, agencies, alumni and other groups that have a stake in the activities of the department in academic, research, and/or outreach efforts. The input from these Boards is used in molding current as well as future activities of the respective department. Their feedback is documented and shared with the faculty as well as the dean, associate deans, and other department chairs.

Faculty Networking

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. The major concerns and issues that may develop into research studies are shared with other faculty members, the department chair, the associate deans and the Dean. This information is integrated into planning by School and is reflected in its program initiatives and efforts to address interests and concerns of the diverse audiences served by the ARP. A faculty networking that has been institutionalized is the “Industry-Agency Roundtable Breakfast” sponsored by the SAES Advisory Council.

Boards and Organizations

The administrators and faculty are represented on a broad variety of 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. A representative list of the board and organizations appears below:

Advisory Board for Carolina Farm Stewardship Association	Center of Turfgrass Education and Research
Agricultural Advancement Consortium <i>(governor appointed group to revitalize farming in state)</i>	City and Farm Committee, Guilford County Cooperative Extension Service
American Dairy Science Association	Conservation Council of North Carolina
American Society of Animal Science	Fashion Group International--Carolina Region
Carolina Farm Stewardship Association	Guilford County Advisory Board on Environmental Quality
Center for Energy Research and Technology (campus based)	Institute of Food technologists (IFT)

International Textiles and Apparel	North Carolina Future Farmers of America
North Carolina Agribusiness Council	North Carolina Geology Advisory Board
North Carolina Agromedicine Institute	North Carolina Institute of Nutrition
North Carolina 220 Swine Regional Group	North Carolina Invasive Species Advisory Committee
North Carolina Association of Family and Consumer Sciences	North Carolina Pork Council
North Carolina Board of Landscape Architects for License	North Carolina Solar Energy Society
North Carolina Cattlemen's Association	North Carolina Turf Grass Environmental and Education Board
North Carolina Community Development Initiative, Inc.	Partnership of Under-Represented Scientists United for Education (PURSUE)
North Carolina Coalition of Rural and Farm Families, Inc.	Rural Advancement Fund International (RAFI)
North Carolina Farm Bureau Federation	Sustainable Farming Program

B. How Groups are Selected as Stakeholders

The members of campus advisory boards are selected from the stakeholder groups that either use the research results produced or can employ students from the SAES degree programs. These persons are selected because of their positions in the various agencies, industries, or communities. Their input is solicited through informal sharing as well as received from more formal contractual or written requests.

C. How Stakeholder Input is Processed into Strategic Action

As described individually under the various sections of A above, the information gathered from the stakeholders is shared with faculty and administrators mainly through verbal discussions. The information is used to mold the strategic plans of the Agricultural Research Program and guides future development and use of resources.

III. Program Review Process

There have been no significant changes in our merit review and scientific peer review processes submitted as a supplement to our 5-Year Plan of Work.

IV. Evaluation of the Success of Multi and Joint Activities

Although 1890 institutions are not required to report in this section, it is noted that NCA&TSU researchers continue to participate in regional research studies. The studies are listed below:

1. “Impacts of Trade Agreements and Domestic Policies on the Competitiveness and Performance of Southern Agriculture”

2. “Genetic and Functional Genomic Approaches to Improve Production and Quality of Pork”

V. Integrated Research and Extension Activities

A major goal of the NCA&TSU faculty and administration continues to seek greater impact through meaningful interaction between research and Extension activities. A new activity this year is the combined efforts of the Evans-Allen and Extension Programs in offering joint funding for researchers and Extension personnel to integrate their efforts to address state problems and issues. This has been in the form of a jointly issued competitive request for proposals that demonstrate “best practices” in integrating the combined efforts of researchers and Extension personnel. Five projects were selected that not only address state issues, but that also can demonstrate effective integration strategies. Equal, but small funding, was contributed from the research and Extension budgets. The Dean and Associate Deans selected the projects based on pre-determined criteria and rating scales. The projects are under way and will report in the next two years, including presentation to the full faculty on results, successes and areas needing improvement for integrating research and Extension efforts.