

NORTH CAROLINA

COOPERATIVE EXTENSION

AREERA POW REPORT

Agricultural Research, Extension and Education Reform Act of 1998

2000
(submitted March, 2001)

North Carolina Cooperative Extension
North Carolina State University and North Carolina A & T State
University

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Report: 2000 AREERA Report for North Carolina Cooperative Extension

This report represents the combined Extension programs of both North Carolina State University and North Carolina A & T State University as represented in the AREERA plan of work submitted in 1999 and subsequently revised in 2000.

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INTRODUCTION

To achieve their shared land-grant missions, the College of Agriculture and Life Sciences at NC State University and the School of Agricultural and Environmental and Allied Sciences at North Carolina A&T State University work collaboratively to provide educational opportunities that are relevant and responsive to the needs of individuals, communities, counties and the state. At the heart of their partnership is North Carolina Cooperative Extension.

Cooperative Extension's mission is to help people put research-based knowledge to work for economic prosperity, environmental stewardship and an improved quality of life. To address ever-changing needs, the organization operates under a dynamic long-range plan -- one that changes as circumstances indicate it should. The plan encompasses 20 major programs that focus on five major areas of concern statewide:

- **sustaining agriculture and forestry**

- protecting the environment
- maintaining viable communities
- developing responsible youth
- developing strong, healthy, and safe families

To achieve the plan's 75 major objectives, specialists at the state's two land-grant universities work hand-in-hand with field faculty stationed in all 100 counties and on the Cherokee Reservation. These Extension professionals' work is coordinated with the efforts of the North Carolina Agricultural Research Service, the research arm of the College of Agriculture and Life Sciences. In fact, over 100 of the 350 extension faculty within the college have joint appointments with the research service.

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

In addition, to ensure that underserved and underrepresented audiences are among those included in program development and implementation, Cooperative Extension has established a new civil rights plan that includes computer monitoring of program participation by gender and race. A permanent Diversity Task Force monitors programs, suggests policy, develops and conducts training for the organization.

Stakeholder input undergirds all of Extension's efforts, as it did and continues to in planning and implementing the five-year AREERA Plan of Work. This report reflects the North Carolina Cooperative Extension program impacts through the joint educational programming efforts of the North Carolina Cooperative Extension Service of NC State University and the Cooperative Extension Program of NC A & T State University. These program results reflect Cooperative Extension's program impacts resulting from educational opportunities to help North Carolina's 8 million citizens address critical challenges facing them today and in the future.

Funding for these Extension programs was provided by Smith-Lever appropriations, state and county funds, plus public and private grants.

Additional North Carolina Cooperative Extension program accomplishments and success stories can be found on the NCCES Web site at <<http://www.ces.ncsu.edu/>>, and then to <<http://www.ces.ncsu.edu/AboutCES/>>.

A. FY 2000 Annual Report of Accomplishments and Results

Goal 1. AN AGRICULTURAL SYSTEM THAT IS HIGHLY

COMPETITIVE IN THE GLOBAL ECONOMY

Overview

Goal 1 encompasses extension programs that seek to create and support an agricultural system that is highly competitive in the global economy. North Carolina agriculture faced major challenges during the period covered by this report. The eastern part of the state was devastated by hurricanes and floods in 1999. Farmers were faced with very low prices for many traditional farm commodities, with little prospect for improvement, and tobacco farmers were faced with large cuts in quota. Only large federal and state government payments prevented a major financial disaster. Other issues affecting agricultural competitiveness and profitability included the development of new state environmental regulations, adverse publicity on the subject of biotechnology, new technology and the changing structure of agriculture, and continued pressure from urbanization.

Field faculty and state specialists of North Carolina Cooperative Extension at NCSU and NC A&T SU developed and delivered a broad array of extension programs to meet these challenges. Livestock generate more than 50% of North Carolina's gross farm income. Programs target hog, poultry, beef, dairy, goat, horse, and aquaculture producers. Activities range from the development of nationally and internationally recognized web- based information sources for hogs, poultry and goats to traditional basic educational programs for first time goat and horse producers. The innovativeness of Extension programming is illustrated by the use of global positioning technology by Extension specialists in an effort to control the spread of a disease of turkeys.

Low commodity prices for traditional row crop and cuts in tobacco quota have put financial pressure on producers. Educational programs seek to assist producers through cost cutting changes in production practices and the adoption of new marketing and risk management strategies. Tobacco companies announced that they would buy most of their tobacco through marketing contracts with growers, bypassing the traditional auction. In addition, these companies will require that flue cured tobacco be cured in barns with indirect heating systems and this means that all existing barns must be retrofitted on a short time line. Extension responded promptly with programs to address these issues.

Specialty crops are important segment of North Carolina's agriculture. Nursery, greenhouse and vegetable crops contribute over \$1.25 billion to farm gate value and this share is growing. Interest in specialty crops is very high. Part of this interest is the result of cuts on tobacco quota and low prices for traditional farm commodities and part of the interest reflects market opportunities arising from a healthy economy and a growing urban population. Activities include regional and county workshops on alternative income sources, including agro-tourism, organic production methods, turfgrass production, various ornamental crops, beekeeping, strawberries, blackberries, blueberries, dewberries, sweet potatoes, pumpkins, tomatoes, lettuce, watermelons and specialty types of melons, various types of beans, broccoli,

squash, and peppers. These meetings attract all audience types including new producers and existing producers, limited resource and part-time producers.

Topics addressed include cultural practices and alternative marketing channels and strategies. Marketing initiatives included creating grower associations, promoting the use of local farmers markets, starting pick or cut your own operations, and combining agro-tourism and direct marketing.

Audiences reached by programming under Goal 1 encompass the full range, from large commercial producers to part-time and limited resource farm families. Volunteers provide additional resources and contribute significantly to the productivity of extension programming. 4,688 volunteers contributed a total of 39,979 hours of their time to programming related to this goal.

Key Theme: Agricultural Competitiveness

- a. Crop farmers, farm organizations, and agribusiness's will become knowledgeable of local and global market factors and develop strategies to cope with or take advantage of these factors to maximize farm profits.
- b. Program Accomplishments: 5,089 program participants increased their awareness and knowledge of the impacts of global market trends and trade policies. 662 participants adopted practices associated with new products. 831 participants adopted practices that impacted marketing successes.

Estimated financial impacts included \$2,719,003 in increased profitability through adoption of local and global marketing strategies and \$224,860 increased profits through adoption and marketing of new products. 78 volunteers were involved and contributed 327 hours valued at \$ 3,270.

Key Theme: Agricultural profitability

- a. Producers and marketers of livestock, poultry, and aquatic species will select, adopt and successfully implement practices or enterprises that will achieve individual and family goals related to profitability and quality of life.
- b. Program accomplishments include increased awareness and knowledge of best management production practices by 28,914 individuals. This total included 487 dairy producers, 9529 beef cattle producers, 2788 hog producers, 9645 horse producers, 1830 sheep or goat producers, 4268 poultry producers, and 367 producers of aquatic species

11,402 producers adopted best management practices that optimized income, including 338 dairy producers, 3553 beef cattle producers, 728 hog producers, 3621 horse producers, 1206 sheep or goat producers, 1854 poultry producers, and 102 producers of aquatic species.

2875 producers applied improved farm financial planning practices and procedures. This included 164 dairy producers, 871 beef cattle producers, 453 hog producers, 614 horse producers, 357 sheep or goat producers, 402 poultry producers, and 14 producers of aquatic species.

A total of 2296 volunteers assisted with extension programming. These individuals contributed 19,145 hours of their time, valued at \$191,450. Estimated financial impacts on producer income were \$6,265,110. This included income that resulted from improvements in animal nutrition, breeding practices, marketing, buildings and facilities, and health and general management practices.

Key Theme: Agricultural profitability

- a. Farmers will be assisted in evaluating alternative production practices to ensure continued farm productivity and enterprise profits.
- b. Program accomplishments include the adoption of practices such as field selection, pest management, improved varieties, harvest techniques, and equipment adaptability. The number of producers adopting these practices was 3,446 and 388,290 acres were impacted. The financial impact of adopting these practices was estimated to be \$451,715,400. The 405 volunteers involved contributed 2193 hours, worth \$ 21,930.

Key Theme: Agricultural profitability

- a. Farmers will continue to evaluate recommended or conventional production practices and management systems, integrating them into sustainable farming systems.
- b. Program Accomplishments: 9350 producers adopted best management practices in such area as pest control, tillage, fertilization, labor management, etc, that increased their yields. 17,838 producers increased their awareness and knowledge of production systems. 6,044 producers adopted practices that lowered production costs or kept production costs below income from the farm. 1,161,365 acres were affected. All of this contributed to stabilizing or increasing the number of farms and the crop acreage on 4224 farms and 92,090 acres.

The financial impacts were as follows: Increased profits through adoption of practices such as choice of high yield varieties, tillage, pesticide application timing, improved marketing of \$9,939,682 and reduced costs through improved pest management of \$6,189,800.

A total of 1173 volunteers were involved in programming, contributing a total of 11,769 hours valued at \$ 117,690.

Key Theme: Diversified/Alternative Agriculture

- a. Farmers will be assisted in investigating innovative agricultural opportunities and exploring marketing options to ensure continued farm productivity and enterprise profits.
- b. Performance measures include 807 producers who adopted new market options . 3429 producers gained an increased awareness and knowledge of alternative production systems. A total of 93,778 acres were affected. The increase in profitability through the adoption of new marketing options was estimated to be \$2,713,345.

Key Theme: Diversified/Alternative Agriculture

- a. Producers will identify, create and develop alternative agricultural opportunities and enterprises.
- b. Program Accomplishments: 2,896 producers gained knowledge about alternative production and market practices. 1,822 producers indicated an interest in developing alternative enterprises and producers tried alternative enterprises, methods, and practices. \$2,376,465 was invested in the production and marketing of alternative enterprises and \$1,535,151 in gross income resulted from this new investment.

The number of volunteers involved was 207 and they contributed 1,409 hours. This time was worth \$14,090.

Key Theme: Small Farm Viability

- a. Limited resource producers and marketers of livestock, poultry, and aquatic species will select, adopt and successfully implement practices or enterprises that will achieve individual and family goals related to profitability and quality of life
- b. Program Accomplishments: 604 limited resource producers increased their awareness and knowledge of best management production practices. 335 producers adopted best management practices that optimized income. 86 producers adopted improved farm financial planning practices and procedures. Estimated financial impacts on producer income were \$135,763. This included income that resulted from improvements in animal nutrition, breeding practices, marketing, buildings and facilities, and health and general management practices.

Key Theme: Small Farm Viability

- a. Part-time and limited resource farmers will increase the sustainability of their farms through crop diversification, intensive management practices, water and nutrient management, and expanded markets.
- b. Program Accomplishments: 912 producers adopted best management practices such as nutrient management, etc. on 70,577 acres. 2,095 producers increased their awareness and knowledge of marketing options and 549 started to use multiple markets. 1,255

producers increased their awareness and knowledge of irrigation and management systems. 569 were helped to stay in farming through the adoption of sustainability practices. 347 producers adopted new crops, which affected 5,068 acres. The projected increase in profits through diversification of crops is \$1,622,331. 253 volunteers contributed 3,987 hours of time, which was valued at \$39,870.

Key Theme: Small Farm Viability

- a. Limited resource farmers will use an integrated, systems approach to implement alternative agricultural opportunities and enterprises.
- b. Program Accomplishments: 1,426 producers were interested in this approach, 1,361 gained knowledge about alternative production and market practices, and 446 tried alternative enterprises, methods, and practices. Outside funding support was obtained in the amount \$52,602. 276 volunteers were involved. They contributed 1,149 hours of their time valued at \$11,490.

FTEs & Program Cost for Goal 1

State FTEs - 50.84	County - 72.07	Program cost- \$6,762,077
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NCCES FTEs -State 50	County - 71	Program cost- \$6,681,635
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NC A & T FTEs - State .84	County - 1.07	Program cost- \$80,442
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Goal 2. A SAFE AND SECURE FOOD AND FIBER SYSTEM

To ensure an adequate food and fiber supply and food safety through improved science-based detection, surveillance, prevention, and education.

Overview

National Goal # 2 addresses the subject area of a safe and secure food and fiber system. North Carolina Cooperative Extension’s 1999-2004 Plan of Work for Goal #2 covers nine (very) diverse Performance Goals including: Goal 1 - Agriculture and the Environment; Goal 2 - Animal Production and Marketing Systems; Goal 3 - Crop Production and Marketing Systems; Goal 4 - Food Products Manufacturing; Goal 5 - Forest Products Manufacturing; Goal 6 - Food and Forest Products Manufacturing; Goal 7 - Food Safety and Quality; Goal 8 - Biotechnology; and Goal 9 - Residential and Community Water and Waste. Each of these Performance Goals addresses various aspects of the food and fiber continuum that impact the safety and security of our food and fiber supply. A brief synopsis of several successful accomplishments by individual performance goal is below.

Performance Goal 1: The safe and judicious use of agricultural pesticides by commercial and private applicators remains a top priority of the North Carolina Cooperative Extension Service (NCCES) and (is) the primary objective of Performance Goal 1. To address the regulatory mandate for certification and re-certification of (pesticide) applicators, NCCES Specialists from

five different departments developed a highly successful and in-depth training curriculum for private and commercial pesticide applicators. Of the 1,836 commercial applicators that were certified in 2000, 71%, or 1,300, participated in one of several two-day Pesticide Schools offered by NCCES specialists in preparation for taking the certification exam. Moreover, 1,811 commercial applicators attended Extension-sponsored training programs as a requirement for obtaining continuing education credits. Thirty-two percent (32%) of the 24,186 private applicators who received either certification or re-certification also participated in the NCCES Pesticide Education program. The success of this first-year program is anticipated to go a long way towards meeting the objectives of this performance goal and National Goal 2.

Performance Goal 2: Performance Goal 2 is also covered under National Goal 1. North Carolina has been plagued with a number of natural disasters over recent years that have severely impacted the animal agriculture industry. In particular, the significant loss of livestock, poultry, and agricultural facilities caused by flooding from recent hurricanes has spurred state, county, and NCCES agencies to develop a state (SART) and county (CART) animal response team program for handling future disasters. Based around the Incident Command System developed by the National Forest Service, both state and county SART and CART plans have been developed or are currently under development. It was estimated by one of the North Carolina counties that adoption of their CART plan would save their county approximately 66% in costs for managing any future natural disasters of a similar type.

Performance Goal 3: This goal is targeted at increasing the understanding and knowledge about biotechnology and the use, benefits, safety, and risks associated with the production of genetically engineered crop plants (also covered under Performance Goal 8 - Biotechnology). This performance goal is also covered under National Goal 1. This performance goal was completely reorganized in 2000. Action teams were established for tobacco, peanuts, cotton, grains, vegetables, fruits, ornamentals, and turf. These teams include all specialists and representative extension agents in a given commodity and are responsible for identifying and establishing (biotechnology) program needs, plans, activities, and reporting. With this new approach there has been a new birth of cooperative activity plus an enhancement of team activities.

Performance Goal 4: Food Products Manufacturing was combined with Performance Goal 7 - Food Safety and Quality.

Performance Goal 5: This performance goal addresses the manufacture of forest products, which is also covered under National Goal 4. The primary objective of this goal has been to increase the competitiveness and profitability of North Carolina's wood products industry, improve markets, and increase consumer understanding of wood products and their proper use. Towards this goal, extension faculty conducted 145 successful workshops, conferences, seminars, etc. that reached approximately 3,333 forest industry representatives or consumers. An additional 50,000 individuals were reached by other communication methods (i.e., brochures, reports, popular press, the web, etc.). The economic impact of these educational endeavors was estimated at \$14.2 million and included savings through improved utilization or productivity, increased production of value-added products, and savings through improved yield, efficiency, and marketing.

Performance Goal 6: In an effort to assist new and potential entrepreneurs in the food products manufacturing sector, Extension specialists developed an assistance program that introduced entrepreneurs to food safety concepts, assisted them in understanding and complying with applicable federal and state food laws and regulations, provided laboratory assistance in

evaluating their products, and provided education and assistance in meeting nutritional labeling requirements. The training program was also offered to county agents with food safety responsibilities who then provided assistance to entrepreneurs within their counties. (During 2000 more than) 100 (food) entrepreneurs submitted samples for laboratory testing and/or requested assistance on nutritional labeling.

Performance Goal 7: To address the national problem of foodborne illness, Extension specialists and field faculty provided training under the nationally-recognized ServSafe: Serving Safe Food program in 45 counties. Over this past year 2,591 foodservice managers and 2,105 food handlers participated in this program. Of these, 1,992 service workers and 2,159 food handlers adopted safe handling practices. Phase I of an on-farm HACCP training program was delivered by Extension specialists to over 90% of the state's poultry integrators. Moreover, quarterly HACCP roundtables were held for North Carolina poultry processors as a mechanism to address existing HACCP problems and future regulatory mandates. **Performance Goal 8:** As a method for increasing the knowledge base and confidence in biotechnology, the 17th Eloise S. Cofer Family and Community Issues Forum focused this year on the topic of ABiotechnology, Food and Consumer - the Science and the Safety.@ Over 160 participants comprised of Extension professionals, dietitians, university faculty, and industry representatives were in attendance to hear five of the nation's top experts on biotechnology). Participants surveyed following the forum gave a high rating (average of 8.6 on a 1 to 10 scale where 10 is high) as to the conference's impact on increasing awareness about biotechnology.

Performance Goal 9: Educational programs targeting the general public, businesses, and professionals were used to teach individuals about water quality, waste water management, and watershed management. In addition, water screening and demonstration projects in watershed and wastewater management were held. Nearly 20,000 individuals increased their knowledge and 7,404 adopted best management practices (BMP) to improve drinking water quality; 2,033 wells were protected by introducing BMPs; 1,400 individuals had their water tested/treated, and over 4,200 people and 250 businesses, local governments, and development professionals adopted BMPs to protect and improve surface and ground water.

Significant progress has been made towards each of the nine Plan of Work performance goals. As noted in the report, some of the performance goals have been combined and/or re-written to improve the overall plan and better capture new areas of emphasis. Moreover, a number of the activities reported under Goal #2 now fall under other National Goals as defined by the key themes and Goals outlined in Appendix A of the Guide for Preparing the Annual Report of Accomplishments and Results.

Performance Goal 1: Agriculture and the Environment

Key Theme: Pesticide Application (also addressed under Goal 4)

- a. The Pesticide Certification and Licensing Program provides a direct link between NCCES and North Carolina's farmers. North Carolina private pesticide applicators are required to renew their certification every 3 years in order to use restricted-use pesticides in their farming, nursery or greenhouse operations. A new training curriculum developed by the Pesticide Education Specialists was implemented in 2000. The program covers worker protection and record keeping, calibration, pesticides and human health, proper

pesticide use, and the Food Quality Protection Act through a variety of scripted slide sets, fact sheets, videotapes, and other educational materials. Specialists from 5 departments within (the NCSU) College of Agriculture and Life Sciences were brought together to complete this program. County Pesticide Coordinators are given the freedom to choose a slide set or videotape from at least two of the five general topic headings noted above. To maintain a strong partnership with the Pesticide Section of the North Carolina Department of Agriculture and Consumer Services, the coordinators are encouraged to call on local pesticide inspectors to present the training on worker protection and record keeping. After its first full year of implementation, many Extension agents have communicated the impact this program has had in making their work much easier and on their audience's high interest level in the subject matter. This program will have a (great) impact on the private applicator's perception of pesticide training by the (NCCES).

- b. Impact - The (NCCES) provides pesticide training for both private applicators and commercial applicators. Commercial applicators are those pesticide users who receive financial compensation for their services, e.g. landscapers, utility rights-of-way managers, etc. There are 13,109 commercial applicators in NC. Of these, 1,836 were newly certified in 2000. The Extension Service conducts two-day Pesticide School throughout the state to prepare prospective commercial applicators for the certification exam. Over 1,300 people attended these schools in 2000. Commercial applicators may obtain continuing certification credits by attending training sessions sponsored by the Extension Service and other agencies. The number of applicators attending these sessions was 1,811. The total number of private applicators is 24,186. Of these, 601 were newly certified last year. Private applicators that were re-certified through the program described in the preceding paragraph numbered 7,229.
- c. Scope of Impact - State Specific

Performance Goal 2: Animal Production and Marketing Systems

Key Theme- Sustainable Agriculture (covered under Goal 4)

- a. Providing educational opportunities for farm and non-farm citizens to address controversial issues related to animal agriculture including food quality and safety assurance not only sustains the NC animal agriculture industry but also provides for the production of safer food products derived from animals. In 2000, issues related to animal agriculture were addressed by Extension specialists and field faculty using several means of disseminating information including conferences, workshops, scientific meetings, radio and television shows, the WEB, magazines, newsletters, Extension bulletins, and local, state, and national newspapers.
- b. Impact - More than 5,500 farmers and 103,000 non-farm citizens improved their knowledge, understanding, attitudes, and appreciation for animal agriculture through these various educational avenues. Moreover, 4,285 farmers and 90,885 non-farmers increased their understanding of the animal food supply and quality standards and nearly 2,300 farms adopted appropriate animal agriculture standards, practices, and procedures

of operation.

- c. Scope of Impact - State Specific

Key Theme - Food Accessibility and Affordability

- a. In response to several recent natural disasters that have caused significant loss of livestock, poultry, and agricultural facilities through flooding, state, county, and NCCES agencies have engaged in an effort to develop a state (SART) and county (CART) animal response team program for handling disasters that involve livestock and poultry. Based around the Incident Command System developed by the National Forest Service, both state and county SART and CART plans have been developed or are currently under development. To cite an example of one success story, several field faculty from the Pender County Extension Center led a 22-member steering committee in developing a CART plan for their county. The comprehensive plan covers disaster preparation, search and rescue, mortality disposal, identified resources, and numerous other topics. The objectives of the CART plans are directed at conducting agricultural animal search and rescue operations, addressing the proper collection and disposal of animal mortality, preventing the contamination of animals and their environment, and maintaining the safety of these animals by preventing cross-contamination of animals with hazardous chemicals and pathogenic microorganisms.
- b. Impact - The Pender County CART team estimated that by following their CART plan, costs incurred during future disasters of a similar type should be reduced by as much as 66% (based on costs incurred following Hurricane Floyd). Based on the prompt response of this team in developing the comprehensive plan, the Pender CART plan has been used as a model by other counties.
- c. Scope of Impact - State Specific

Key Theme - Animal Genomics, addressed under Goal 1

- a. The development of improved genetic selections of livestock not only can result in improved production characteristics such as faster growth rates and better feed efficiencies, but can also enhance the animal's disease resistance and improve nutritional quality of the finished meat product. Under the NC On-Farm Performance Testing Program, nearly 17,000 head of swine were evaluated. This program currently provides genetic improvement to over 70,000 commercial sows producing approximately 1.2 million pigs annually.
- b. Impact - Phenotypic changes created by improved genetic selections indicate an additional reduction of 2 days to reach 250 pounds with 0.05 inches less fat in breeding animals that are selected to provide replacements in commercial production. If only a 1-day improvement is observed in bringing the animal to market, total annual costs of production are reduced by \$0.17/head or \$204,000.
- c. Scope of Impact - State Specific

Key Theme - Agricultural Profitability, addressed under Goal 1

- a. Beef Marketing - A recent comparison by Extension Specialists and Field Faculty of graded sales and weekly auctions held during the same time frame demonstrated a significant increased value associated with selling cattle in larger uniform lots. A comparison of the average weekly auction prices, as reported by the Market News Section of the N.C. Department of Agriculture (and Consumer Services), and graded sale averages for sales held during the same time frame revealed that the graded sales are indeed a good marketing option for commercial beef producers.
- b. Impact - Consignors to this year's graded sales received an additional \$222,000 for their steers and \$200,000 for their heifers, compared to selling in weekly auctions. This average premium does not include the additional savings consignors receive at graded sales through payments based on in-weights versus payments based on out-weights in weekly auctions. We estimate this difference to be at least 3%, which would amount to an additional sale weight of 17 lbs. (570 lbs. average weight times 3%) at the average per hundredweight price of about \$86.50, or an additional impact of about \$14.70 per head. These savings would add \$230,000 to the receipts of consignors for graded sales held this fall. Combined, the net increase in income for calves sold through graded sales exceeds \$650,000 or \$41.00 per calf. This difference amounts to an average premium of 9% over weekly auction sales.
- c. Scope of Impact - State Specific

Key Theme - Youth Development, addressed under Goal 5

- a. Youth Programs in Animal Science - Interest in animal related 4-H youth programming remains strong, with several programs documenting significant increases in participation during 2000.
- b. Impact - Overall participation in all 4-H animal programs grew approximately 13 percent from 50,578 contacts in 1999, to 57,221 contacts in 2000. Agents reported participation increases in both traditional and non-traditional programs. While many programs demonstrated mass success in 2000, some of the less obvious personal success stories indicate the true effectiveness of 4-H. Danny Butler, 4-H Agent in Martin County, tells of Suzanne who lost her mother in a traumatic automobile accident at the age of eight. Following the accident Suzanne could only communicate with her closest family members. Beginning with a lamb project, Suzanne participated in 4-H activities that allowed her to safely develop the confidence she needed to become a happy, healthy, and productive citizen. Now that Suzanne has completed her 4-H eligibility her father "credits 4-H for providing structured, developmental activities that were fun, allowing her to grow and excel without realizing these activities were structured for her growth."
- c. Scope of Impact - State Specific

Performance Goal 3: Crop Production and Marketing Systems

Key Theme - Biotechnology, addressed under Goal 1

- a. The objective of Performance Goal 3 is to increase the understanding and appreciation of citizens about biotechnology and its use, benefits, and risks associated with the production of genetically engineered crop plants. To achieve this goal Extension specialists and field faculty provided educational materials and training through conferences, workshops, scientific meetings, radio and television shows, the Worldwide WEB, magazines, newsletters, Extension bulletins, and local, state, and national newspapers.
- b. Impact - Approximately 35,000 citizens increased their awareness and understanding of the safety, uses, and benefits of crop production through genetically engineered crop plants. Moreover, nearly 3,300 farmers adopted biotechnological applications to crop production by utilizing genetically engineered crop plants that were applied over 400,595 acres of North Carolina crop land. Cost savings associated with using genetically engineered crop plants were estimated at \$7.5 million in optimized profits and \$2.2 million in reduced pesticide use from planting more pest resistant crops developed by genetic engineering.
- c. Scope of Impact - State Specific

Key Theme - Plant Production, now addressed under Goal 1

- a. This Performance Goal was completely reorganized in 2000. Action teams were established for tobacco, peanuts, cotton, grains, vegetables, fruits, ornamentals, and turf. These action teams include all specialists and representative agents in a given commodity and are responsible for identifying and establishing program needs, plans, activities, and reporting. Furthermore, the number of objectives has been reduced from 7 to 3 and includes: 1. Producers and allied industries will evaluate and integrate appropriate new or conventional production practices to improve profitability and quality of life in a sustainable agricultural system; 2. Farmers, farm organizations, and agri-businesses will become knowledgeable of local and global market factors and develop strategies to cope with or take advantage of these factors to maximize farm profits; and 3. Farm families will improve profitability and quality of life through evaluation and adoption of appropriate changes to their enterprise mix. An array reporting system driven by agent needs is currently under development.
- b. Impact - A summary of our work in 2000 has been to establish a foundation for teamwork and development of educational programs in plant systems. There has been a new birth of cooperative activity in some areas and an enhancement of team activity in other areas. We are now much more representative of stakeholders, agents, and specialists.
- c. Scope of Impact - State Specific

Performance Goal 4: Food Products Manufacturing, has been combined with Performance Goal 7 - Food Safety and Quality

No report under this performance goal

Performance Goal 5: Forest Products Manufacturing

Key Theme - Forest Crops, which is addressed under Goal 4

- a. The main theme of Cooperative Extension Major Program 10, Forest Products Manufacturing is to increase the competitiveness and profitability of North Carolina's wood products industry, improve markets, and increase consumer understanding of wood products and their proper use. To meet this goal, faculty conducted, organized, or participated in 145 workshops, conferences, seminars, short courses, and classes for forest industry and consumer audiences.
- b. Impact - These efforts reached an estimated 3,333 individuals. An additional 50,000 individuals were reached via referred publications, brochures, reports, pamphlets, non-refereed publications, computer software, popular press articles, and the web. These activities resulted in 63 firms adopting new manufacturing techniques, 142 consumers adopting practices related to the selection, use, and maintenance of wood products, 2,043 individuals increasing their knowledge of the economic importance of the wood products industry, and 10,697 consumers increasing their understanding of forest products and their proper use. In economic terms these activities resulted in the following impacts: \$9,600,000 saved through improved utilization or productivity; \$1,400,000 in increased production of value-added products; and \$3,156,000 saved through improved yield, efficiency, and marketing.
- c. Scope of Impact - State Specific

Performance Goal 6: Food and Forest Products Manufacturing

Key Theme - Forest Crops, addressed under Goal 4

Key Theme - Promoting Business Programs, addressed under Goal 5

- a. Extension Specialists have produced a program of entrepreneurial assistance in North Carolina for those persons attempting to start a food business. This program is meant to introduce the entrepreneurs to food safety concepts, assist them in determining the regulations that cover their products, perform some initial laboratory evaluations, and assist with nutritional labeling requirements.
- b. Impact - County agents with food safety responsibilities were trained in the basics of getting started in the food business so they could assist entrepreneurs in finding appropriate resources. A resource web site was established. In addition, over 100

entrepreneurs requested laboratory and nutritional labeling assistance over the year.

- c. Scope of Impact - State Specific

Performance Goal 7: Food Safety and Quality

Key Theme - Food Safety

- a. NCCES programming addressed two of the six priority areas in the 1997 National Food Safety Initiative -- (1) coordination of food safety activities between the private sector, academia, and regulatory agencies, and (2) education of food handlers. The foodservice industry is the second largest retailer in NC employing over 250,000 people. According to the Centers for Disease Control and Prevention, nearly 50% of all reported foodborne illness outbreaks are attributed to unsafe food handling practices occurring in foodservice operations. To address this problem, 45 counties have been offering the nationally recognized ServSafe: Serving Safe Food program. ServSafe is a nationally recognized certification program developed by the Educational Foundation of the National Restaurant Association.
- b. Impact - In 2000, 2,591 foodservice managers completed 71 county-based programs and 2,105 food handlers completed 746 classes. Of those completing these programs, 1,992 service workers and 2,159 food handlers adopted safe food handling practices.
- c. Scope of Impact - State Specific

Key Theme - HACCP

- a. Extension specialists have taken a leadership role in the effort to move the processed food industry to the use of HACCP as the preferred food safety system. To accomplish this goal, the work was generally broken down by commodity emphasis. This approach was important because of the differing regulations associated with individual commodities and regulatory entities. The main thrust in red meats has been working with small and very small processing plants to assist in developing HACCP plans. For poultry processors, the focus has been directed mainly on the needs of large processing plants and verifying existing HACCP plans. One method for accomplishing this goal with poultry processors was to host quarterly HACCP roundtable workshops. In response to the likely future requirement for an across-the-board on-farm HACCP program for poultry producers, Extension faculty from several departments across the College of Agriculture and Life Sciences developed and delivered a two-phase on-farm HACCP training program for poultry producers (Phase I - 6-hour introduction to HACCP; Phase II - Assistance in the development of individual HACCP plans for growers). For the seafood industry, efforts were directed toward assuring compliance. In the Grade A dairy industry, the focus was on a pilot safety program which explored the voluntary adoption of HACCP as opposed to the traditional HACCP system.
- b. Impact - Four 6-hour on-farm HACCP workshops were conducted across the state for

mid- to upper-level poultry managers representing the state's poultry integrators. Over 145 participants representing all of the state's major poultry integrators attended these workshops. Ninety eight percent of the participants felt the workshops were of considerable benefit to their understanding of HACCP principles and that they would participate in future Phase II activities (development of integrator-specific on-farm HACCP plans for each phase of the production continuum). This past summer an evaluation team consisting of Extension, FDA, state regulatory, and dairy industry representatives audited and evaluated six processing plants across the nation to determine how the pilot dairy HACCP program would function. It was discovered that the pilot HACCP program generally met the needs for uniformity and reciprocity. Changes are being made to the program based on the evaluation team's findings and the pilot expanded to other states who wish to enter the program. Evaluation will continue for two more years.

- c. Scope of Impact - State Specific

Performance Goal 8: Biotechnology

Key Theme - Biotechnology, which is also addressed under Goal 1

- a. In October 2001, the 17th Eloise S. Cofer Family and Community Issues Forum focused on the topic ABiotechnology, Food and the Consumer B the Science and the Safety.@ Over 160 people, including Extension professionals, dietitians, university faculty, and industry representatives attended this all day session that featured five of the nation's top experts on biotechnology. The purpose of the forum was to provide an overview of key issues related to biotechnology so that participants gain a better understanding of the advantages and disadvantages of biotechnology.
- b. Impact - Participant's assessment of their knowledge about biotechnology pre- and post-conference showed an increase in knowledge from an average self-rating of 5.43 to 8.34 (n=77), where 1 was low and 10 was high. The respondents gave the forum an overall rating averaging 8.78. With regard to the conference's impact on increasing awareness about biotechnology, respondents said that the forum largely achieved its goals, giving it an average rating of 8.61.
- c. Scope of Impact - State Specific

Performance Goal 9: Residential and Community Water and Waste Management

Key Theme - Water Quality

- a. Educational programs targeting the general public, businesses, and professionals were used to teach individuals about water quality, wastewater management, and watershed management. Water screening was conducted in numerous counties in conjunction with

local health departments and NCSU. Demonstration projects in watershed and wastewater management provided excellent "real life" experiences for local government officials and professionals.

- b. Impact - During 2000, 19,060 people increased their knowledge and awareness of best management practices which would improve drinking water quality with 7,404 adopting one or more practices to improve drinking water quality. As a result of these efforts, it was estimated that over \$400,000 was saved due to citizens not having to replace contaminated wells or use an alternative source for water. Furthermore, 2,033 wells were protected or improved by implementing one or more water quality practices. Specifically, 610 people in counties reported that they had improved their existing wells by extending the casing above ground, regrouting it, or replacing the old casing with steel, concrete, or PVC. Approximately 1,425 people adopted practices such as not storing chemicals in the well house, not mixing or loading chemicals near the well house, or housing animals in or near the well housing to minimize well contamination. Over 1,400 people had their water tested and /or treated appropriately. Over 4,200 people adopted best management practices to protect and improve surface and ground water. Practices included using soil tests to direct lawn and landscape management, using native or water conserving plant materials, proper automobile maintenance techniques, and proper car washing techniques. Over 250 businesses, local governments, and development professionals also adopted best management practices to protect and improve surface and ground water by using less fertilizer and pesticides, implementing erosion control practices, bio-retention practices for storm water wetlands, and initiating stream restoration work. An estimated 7,425 acres of urban and residential watershed were improved by best management practices along with 17,020 linear feet of streams.
- c. Scope of Impact - State Specific

FTEs & Program Cost for Goal 2

State FTEs - 31	County - 45	Program cost- \$3,633,739
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Goal 3. A HEALTHY, WELL-NOURISHED POPULATION

Issue

The importance of promoting nutrition and wellness throughout life has been clearly established. Two recent major scientific reviews, the "Surgeon General's Report on Nutrition and Health" and "Diet and Health" by the National Research Council have documented several diet and chronic disease relationships and have recommended some dietary changes for the public. The Public Health Service "Year 2000 Objectives For the Nation" has also noted the major role that nutrition plays in health promotion and disease prevention.

Behaviors for Optimal Health

Public interest and concern about nutrition and health issues are at an all-time high. While more consumers than ever are aware of the major issues, fewer can put those concepts into everyday practice. At the same time consumers are vulnerable to the myriad of misinformation that targets their concerns and fears.

Scams and misinformation abound and are costing the public billions of dollars. Consumers continue to need help in using the Dietary Guidelines and the Food Guide Pyramid to incorporate balance, moderation and variety in their diets. Research has shown that consumers do not know the food groups, nor the number of servings they and their families should have from each food group. They also do not understand serving sizes and confuse a "serving" with a "helping" of foods. Programs that address these needs continue to be imperative if consumers are to adopt behaviors that optimize their health.

Nutrition and Chronic Disease

Dietary factors are associated with five of the ten leading causes of death in N.C. (and in the U.S.), including coronary heart disease, some types of cancer, stroke, noninsulin-dependent diabetes mellitus, and atherosclerosis. Another three (cirrhosis of the liver, unintentional injuries, and suicides) are associated with excessive alcohol intake. Currently, health professionals are more concerned with excess and imbalance of certain components in the diet than the dietary deficiencies seen in former days. North Carolina has higher age-adjusted mortality rates in comparison to national averages; much of which may be related to what citizens eat. Diets in North Carolina are improving but 1993 and 1994 statewide surveys show that people still consume too much fat, salt and sugar and too little high fiber fruits, vegetables and whole grain foods. Many people have heard and accepted the message that they should reduce the fat, salt and sugar in their diets however, all too often, they don't recognize where these components are in foods or how to lower their intake. As research continues in these areas and as consumers continue to seek the answers to their questions, programs will continue to be needed that address the risk factors associated with various health problems and appropriate lifestyle changes.

Lifecycle Concerns

One of the best indicators of maternal and child health is the infant mortality rate, or the number of babies per 1000 live births that die before their first birthday. North Carolina has historically had an infant mortality rate well above the national average but over the past few years has improved to 9.9. This rate, however is still high and reflects the need for continued programming in the maternal and child area.

No time is more important than childhood to promote healthy eating and health practices. Children in North Carolina do not consume enough fruits or vegetables and have diets that are low in fiber and higher in fat than recommend. Children in North Carolina need quality nutrition education to help positively influence their food choices. For nutrition education efforts to be effective they must also include parents and care givers. Helping families make informed

decisions about their nutrition will help insure that North Carolina's children grow to reach their full mental and physical potential.

Demographic changes in North Carolina's population continue to impact nutrition and health issues. The fastest growing age group in the state is the 65 years-and-over segment. The elderly run disproportionate risks of malnutrition and poverty as well as poor overall health status. In fact, over 85% of older adults suffer from chronic diseases and could benefit from dietary intervention. The general nutrition needs of the well elderly must be addressed, however the needs of the elderly for prevention of malnutrition and chronic disease actually begin much earlier in life. Programs addressed to young adults and the middle-aged consumers will continue to impact the health of the population as it "ages."

Women are employed in greater numbers, many joining the ranks of the working poor. Over 80% of women who had school-aged children were working outside the home; 67% of women with youngest child under six years were in the labor force. For working parents with very limited resources, lack of after-school and summer programs for youth are a major concern.

NCCE Responds

Promoting optimum nutrition and health through diet and lifestyle in all North Carolinians regardless of gender, income, age, or race/ethnicity formed the main focus of Goal 3: A healthy, well-nourished population. Education programs addressing diet, health, and chronic disease prevention were offered to North Carolinians of diverse income levels, age groups, genders, and/or cultural backgrounds across the state. Programs offered included Partners in Wellness, Give Your Heart a Healthy Beat, Healthy Heart, Our Destiny Is Our Decision, Be Active Kids, NoonLiting, Out For Lunch, Expanded Food and Nutrition Education, Project Eat Right-Add to Life program and the In-Home Breast-feeding Support Program. Programs were held in many different settings including congregate nutrition sites, senior centers, schools, churches, government buildings, businesses, daycare centers, work sites and outdoors. Various methods included using the Internet, mailed materials, media, one-on-one contacts, and public meetings. Audiences reached included children, adults and the elderly, day care workers, hospital employees, limited resource individuals and families, Head Start, Red Cross, food banks, and community coalitions. In support of these activities brought in more than 11 million dollars in funds. As a result of programming, over 63,000 participants increased awareness of their need to have good nutrition habits, over 14,000 gained in knowledge concerning reducing risk for chronic disease, and over 24,000 changed diet and lifestyle habits, and improved their quality of life and the quality of life of others. Over 8,000 participants decreased dietary fat consumption, over 6,000 decreased dietary sodium consumption, over 8,000 increased fruit and vegetable consumption and over 4,000 increased dietary calcium consumption. As a result of the changed diet and lifestyles over 2000 decreased high blood cholesterol levels, over 900 decreased high blood glucose levels, over 2000 decreased high blood pressure levels, over 1300 decreased excess body weight and over 2,000 adopted behaviors to improve their chances of delivering a normal weight baby.

Performance Goal #1

Participants will adopt behaviors to promote a healthier diet.

Key Theme: Human Nutrition

- a. The key teaching components include Worksite Wellness programs, health fairs, workshops and demonstrations, after-school programs, parent-teacher programs, and face-to-face encounters. Media is used to effectively disseminate a clear message about healthy eating patterns. Programs such as the Physician's Project, Partners in Wellness and Out For Lunch help participants gain the needed knowledge and skills to adopt healthy dietary behaviors.
- b. Impact - Programs conducted by faculty and field faculty have resulted in positive knowledge and behavior change with respect to healthy eating. Education programs addressing diet and health, were offered to North Carolinians of diverse income levels, age groups, genders, and/or cultural backgrounds across the state. Multiple delivery strategies have been used and tested to ascertain the most appropriate means of reaching the population with meaningful nutrition messages. Programs with sustained impact continue across the state to provide support, information and skills to citizens as they continue to improve eating patterns.

Output Indicators

Numbers of participants increasing knowledge that will promote a healthier diet: 46,786

Numbers of participants increasing awareness of need to have good nutrition habits:
56,080

Numbers of participants changing attitudes and aspirations that will promote a healthier diet: 33,648

Outcome Indicators

Number of participant's who adopt diets consistent with dietary guidelines for good health: 24,222

- c. Scope of Impact - State specific

Performance Goal #2

Participants at risk for chronic disease/condition will change behavior resulting in reduced risk.

Key Theme: Human Health

- a. The key teaching include demonstrations/workshops, health fairs, video and audio tapes, home study kits, supermarket/farmer's market tours, and discussion groups and support groups. The mass media is used to effectively disseminate messages about the

relationship between chronic disease and eating patterns. Programs such as Give Your Heart A Healthy Beat, Partners In Wellness, Out for Lunch, Be Active Kids and NoonLiting help participants adopt eating patterns that will decrease their risk of chronic disease.

- b. Impact - Programs across the state have facilitated a gain in knowledge concerning reducing risk for chronic disease, and over 24,000 changed diet and lifestyle habits, and improved their quality of life and the quality of life of others. Over 8,000 participants decreased dietary fat consumption, over 6,000 decreased dietary sodium consumption, over 8,000 increased fruit and vegetable consumption and over 4,000 increased dietary calcium consumption. As a result of the changed diet and lifestyles over 2000 decreased high blood cholesterol levels, over 900 decreased high blood glucose levels, over 2000 decreased high blood pressure levels, over 1300 decreased excess body weight. Programs that address knowledge, skills and positive behavior change continue to be successful in helping North Carolinians address risk factors related to heart disease, stroke, and certain forms of cancer.

Output Indicators

Numbers of participants who increase knowledge in how to reduce risk for chronic disease: 14,389

Numbers of participants who increase skills that will promote reducing risk of chronic disease: 11,596

Numbers of participants who change attitudes and or aspirations that will promote reducing risk of chronic disease: 10,377

Outcome Indicators

Number of individuals reducing risk factors for chronic diseases (heart diseases, strokes, cancers, adult-onset diabetes, arthritis, arteriosclerosis, and osteoporosis) including:

- Numbers who decrease high blood cholesterol level: 2057
- Numbers who decrease high blood pressure: 939
- Numbers who decrease high blood sugar: 2108
- Numbers who decrease excess weight : 1322
- Numbers who decrease fat in diet to below 30% of calories: 8590
- Numbers who decrease sodium in diet: 6181
- Numbers who increase fruits and vegetable consumption: 8764
- Numbers who increase calcium in diet: 4246
- Numbers who decrease dietary cholesterol to 300mg/day

- c. Scope of Impact - State specific

Performance Goal #3

Participants in nutrition and wellness programs for parents or care-givers and/or children will improve knowledge and adopt behaviors to promote a healthy diet.

Key Theme: Human Nutrition

- a. The key teaching points are training in nutrition for child-care providers, in-home study for parents and children, health fairs for parents and care-givers, one-on-one discussion with parents, and work in the classroom and child-care setting with children. Mass media is used to effectively disseminate nutrition messages to parents and child-care providers about the importance of helping children to form healthy eating habits early in life. Programs such as HomePlate, Be Active Kids, Out For Lunch and SyberShop (a multimedia CD-ROM for adolescents) help young people adopt healthy eating patterns for a lifetime of good health.
- b. Impact - Programs across North Carolina address the issue of nutrition for children by working with children, caregivers and parents. Multiple strategies have been employed to educate child-care providers and provide them with materials to use in the classroom as they teach young children about the importance of eating right for health. No one has more influence on the diet of young children than the parents. Field faculty work to provide parents with meaningful information about nutrition issues for their child as well as providing skills needed to carry out recommendations for good health. Several highly successful programs continue to expand to serve all North Carolinians with emphasis on underserved populations.

Output Indicators

Parents increase awareness and knowledge of importance of good nutrition for children: 3,124

Parents increase knowledge about good eating habits for children: 2,972

Parents and children participating in food and nutrition activities together: 3,939

Child care providers increase knowledge about the importance of good nutrition for children and the importance of teaching children about nutrition: 3,252

Outcome Indicators

Parents adopt food behaviors consistent with the Dietary Guidelines and the Food Guide Pyramid.: 3,031

Children adopt food behaviors consistent with the Dietary Guidelines and Food Guide Pyramid: 2,722

Child care providers teach children about the importance of a healthy diet based on the Dietary Guidelines and the Food Guide Pyramid: 3,252

- c. Scope of Impact - State specific

Performance Goal #4

Limited resource audiences will adopt behaviors that improve the nutritional adequacy of their diet.

Key Theme: Human Nutrition

- d. The key teaching components include neighborhood groups, preformed groups, one-on-one contacts, volunteers and use of the media. Programs such as the Expanded Food and Nutrition Program, Project Eat Right - Add to Life, Breastfeeding Program, Be Active Kids, Out For Lunch, and Partners In Wellness help limited resource audiences adopt behaviors that improve the nutrition adequacy of their diet.

- e. Impact - Many of the programs carried out in North Carolina give special emphasis to limited resource population. Faculty have secured over 11 million dollars in funds to specifically address this population and provide them with meaningful messages on food, nutrition, food safety and food security. Programs are in place that assist limited resource families in stretching their food dollar while being mindful of recommendations for good health. The program in North Carolina stretches across the lifecycle to include prenatal care, infant feeding, child nutrition, and nutrition for the elderly. Successful strategies for reaching limited resource audiences have been developed and tested and will continue and expand in the coming years.

Output Indicators

Numbers and percent who increase in knowledge of nutrition and diet: 27,681
Numbers of participants in programs such as Food Stamps, WIC free/reduced school meals who increased awareness which lead to improved health: 11,379

Outcome Indicators

Numbers and percent who made dietary improvement: 12,142
Numbers of pregnant women seeking prenatal care: 3,545
Numbers adopting behaviors that reduce low-weight births: 2,461

- c. Scope of Impact - State specific
-

Target Audiences for Performance Goals 1-4

General population above 2 years of age
Other food, nutrition, and health professionals
Teachers
Child-care providers
Parents
Business/industry
4-H leaders, volunteers, and youth
Coaches
Working families
Unemployed families
Young families with children who qualify for food assistance (WIC, Food

Stamps, reduced price or free school lunch)
 Pregnant women
 Pregnant and parenting teenagers
 4-H aged youth
 Elderly
 Individuals (above age 2) with increased risk of chronic disease (such as heart disease, cancer, stroke, and diabetes or conditions (allergies, osteoporosis) that require some special dietary needs) and minorities (generally at a higher risk than rest of population). Limited resource individuals (limited culturally, financially, etc.)
 Work-site groups in business and industry Extension Homemakers
 Individuals referred by physicians for risk-reduction programs.

Internal and External Linkages (for Performance Goals 1-4)

There is limitless opportunity to network, collaborate and form coalitions with others to provide the public with quality nutrition education. Such opportunities include but are not limited to:

- North Carolina Universities and Colleges
- Federal and State Agencies
- Media
- Faith Community
- Child-care Centers and Family Day Care Homes
- Local and regional hospitals
- Physicians
- Boys and Girls Clubs
- Head Start
- Parent and Teacher Organizations
- Family Resource Centers
- After School Programs
- Public Schools
- 4-H Youth Development
- Corporate Partners

FTEs & Program Cost for Goal 3

State FTEs - 7.25	County FTEs- 25.07	Program cost- \$1,380,300
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NCCES state FTEs - 7	County FTEs- 25	Program cost- \$1,296,960
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NC A & T state FTEs -.25	County FTEs -.07	Program cost- \$13,890
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Goal 4. AN AGRICULTURAL SYSTEM WHICH PROTECTS NATURAL RESOURCES AND THE ENVIRONMENT

Overview

Agricultural producers, agribusiness professionals, public officials, agency personnel, special interest groups, and the general public are all concerned about environmental quality in North Carolina. Goal 4 promotes efforts to improve production practices and enhance cooperative and collaborative efforts to protect the environment and preserve natural resources while promoting a strong and diverse agriculture are seeing very positive results.

The performance goals under Goal 4 address animal agriculture, plant agriculture (row crops, horticultural crops, and forestry), and agriculture's interactions with the public and government. Target audiences for these action areas are broad in terms of occupation, age, economic status, and knowledge of agriculture.

Under performance goal 1, livestock and poultry producers will adopt and promote sustainable, economical, and environmentally sound practices to manage water and waste materials for the purpose of improving air and water quality protection. An example of the efforts under this goal comes from Scotland county: "An area Certification Training for Animal Waste System Operators was held in Scotland County. Twenty-two producers and swine industry workers from Cumberland, Hoke, Moore, Richmond, Robeson and Scotland Counties attended. Agents from these counties worked together to provide the training. Pre and post tests were given to assess knowledge gained. The difference between the pre test scores (62%) and the post test scores (82%) indicated a 20% improvement."

During 2000, more than 4,200 land application operators were trained and certified. Almost 175,000 acres of best management practices (BMPs) were adopted on units associated with animal production. Those efforts have reduced soil loss by 129,500 tons per year. The estimated economic value of livestock organic byproducts utilized (nutrients, organic matter, etc.) was almost \$13.2 million. In excess of 81% of producers (7,356 of 9,009) are now utilizing approved waste management plans. Over 400 farms adopted at least one BMP (walking trail, stream crossing, managed stream bank vegetation, or mortality composting) last year.

Performance goal 2 is addressed to field crop producers, nursery and greenhouse growers, turf and landscape professionals, and forestry professionals. This goal seeks adoption and promotion of economically and environmentally sound practices to manage water, soil, nutrients, and pesticides for the purpose of improving water quality protection and management of natural resources. In Johnston county "Farmers and landowners have increased concerns about how production practices on their farm affect the environment. New nutrient management, sediment movement, erosion and buffer requirements contained in the Neuse River Basin Rules served as a catalyst for farmers to adopt strategies to meet nutrient reduction requirements. Over 20,000 acres of Johnston County crop land has been enrolled into Precision Farming Programs offered by local agribusinesses. Grid soil sampling and applying variable rates of fertilizer and lime resulted in savings of over \$280,000 for participants on their fertility program."

1,110 industry meetings and trade shows which promoted environmentally sound agriculture were held in 2000. Agribusinesses sponsored at least 93 environmentally focused programs. During 2000, more than 17,900 pesticide application professionals were certified or recertified. Almost 400,000 tons were saved through reduced soil loss from row crop, horticultural crop, or forested land. Over 5,800 acres of wildlife habitat was established. BMP adoption was very

successful, with over 1,300,000 acres in no-till, 509,000 acres in residue management, 273,000 acres using integrated pest management, and 217,000 acres utilizing improved forestry practices. Over 3,600 farms have established one or more water quality BMPs (field borders, filter strips, permanent wildlife cover, or forestry practices).

The intent of performance goal 3 is multi faceted and relates to agriculture's participation in general society. Specifically, it is intended that producers and agribusiness professionals will become knowledgeable of regulations and environmental constraints on production practices; evaluate the impacts of these constraints on their farms; will gain knowledge, awareness, understanding, and skills to develop plans for overcoming barriers that prevent them from realizing the link between informed decision making and the capacity to sustain natural resources; and will become involved in the process by which agriculture and natural resource issues, legislation, rules and regulations are developed. From Bertie County – “Rules and regulations established under Senate Bill 1217 continue to have a big impact on the 90 broiler producers in Bertie County. The producers have been assisted with management plans to help with compliance regulations that include mandatory soil testing, litter testing, liming to soil test, stockpiling buffers, and monitoring of copper and zinc levels in the soil. Assistance was given concerning detailed record keeping to verify agronomic application rates. The impact of the program is an environmentally friendly utilization of poultry litter.”

In 2000, almost 5,050 individuals attended environmental policy seminars and workshops. Multi agency groups delivered more than 230 programs on regulations and environmental constraints. There were at least 530 organized contacts between the agricultural community and special interest groups. As a result of these meetings, over 5,300 individuals indicated that their knowledge of the policy making process had increased. Almost 800 people indicated that their participation in policy making increased. More than 11,100 people stated that they were now more aware of the links between agriculture and the environment.

The programmatic efforts under Goal 4 are targeting producers, agribusiness, youth, municipal and county leaders, environmental groups, news media, financial organizations, and the general public. Our overall intent is to produce a better understanding of the current situation and of the ways and means to accomplish agricultural activities while preserving and improving environmental quality. Notable efforts are occurring in such areas as water quality, animal waste management, soil erosion, recycling, and natural resources management. Results reported in 2000 indicate significant and demonstrable improvements in performance, knowledge, and attitude regarding agriculture and the environment – both in agricultural and non-agricultural communities.

Key Theme - Water Quality

- a. Extension specialists and agents are playing a key role in basin-wide planning efforts which are required for all of North Carolina's 17 river basins. Efforts are focused on protecting both surface and ground water. Extension-initiated educational programs, for producers and the general public, are a key element in reducing nutrient and pesticide contamination in wells and surface supplies of drinking water, in waterways, and in estuaries. Agents and specialists are working with producers and other state and federal agencies to identify

resources that can be used to help improve water quality in our state. Demonstrations, workshops, and public meetings are being used to help producers and others understand the complexities of water quality and how environmental quality and agriculture can coexist.

- b. "...In 2000, eighteen landowners utilized over \$100,000 in State Cost Share Funds to improve water quality in Yancey County. These landowners combined installed 21 livestock watering tanks, 5 one acre each Heavy Use Areas, 2 stock trails for a total of 625 feet, developed 11 springs, and constructed 8,793 feet of livestock exclusion fencing. Water quality in Yancey County continues to improve as a result of this program."
- c. State Specific

Key Theme - Animal Waste Management

- a. Extension personnel are working with swine, dairy, beef, and poultry producers to assure that they are aware of all of the new regulations and requirements for water quality and nutrient management associated with animal production. Phase out of anaerobic lagoons, requirements for alternative waste treatment technologies, waste handling certifications, nutrient management plans, and setback restrictions are just some of the topics that have seen dramatic changes recently and that are having a major impact on the operation of both large and small facilities.
- b. "Farmers who have animal confinement operations, such as dairymen and pig farmers, are required to be certified to apply animal manure to the land. To keep the certification these producers are required to have six (6) hours of credit every three (3) years. For these credits to be most helpful to the producers in the County they were surveyed to see what topics would be most helpful. From this, the County Center provided four (4) hours of education credits in 2000 – "Record Keeping", "Computer Record Keeping" and "Fly & Rodent Control in Confinement Livestock Operations." Record keeping allows producers to keep track of manure applications. Over nine hundred (900) acres in Caldwell County received animal waste as applied by certified Animal waste applicators and since the training zero (0) fly & rodent complaints have been logged."

"Dairy producers struggle to comply with strict environmental regulations. Extension's animal waste operator continuing education program provides direct farm management and record keeping opportunities. Under the guidance of Extension and the local soil and water conservation district, eighteen dairies increased self-responsibility for animal waste management as indicated by annual soil tests, quarterly waste tests, and timely responses to notices of deficiency and timely certification renewals. The result is improved waste application methods and improved water quality."

- c. State Specific

Key Theme - Soil Erosion

- a. Soil erosion continues to be a major concern in North Carolina, since it has both on-site impacts (loss of fertility, gulying, disruption of normal tillage operations) and off-site

impacts (loss of aquatic habitat, pesticide and nutrient pollution, sedimentation in sensitive areas). Extension is working with other state and federal agencies to educate farm and non-farm communities about erosion control and stream bank stabilization. These efforts not only help keep the soil in place, but also improve water quality and recreational opportunities downstream.

- b. “Many individuals perceive agriculture to be the number one polluter of water resources. Strip and no-tillage are one of several tools that can reduce the amounts nutrients entering surface waters. As a result of collaborating with the Soil and Water Conservation District, 10 Ag Cost Share farmers planted 2800 acres of Strip Till and/or No-Till cotton. They prevented 172,000 pounds of Nitrate and 2400 pounds of phosphate from leaving their fields. Soil erosion was reduced by 17,000 tons.”

- c. State Specific

Key Theme - Nutrient Management

- a. Improper application of animal waste, as well as non agronomic application rates of inorganic fertilizers, have led to concerns that agriculture is a major contributor to water quality problems, including *Pfiesteria*, in North Carolina’s rivers and estuaries. Urban sources of nutrients (lawns, golf courses, waste treatment plants) are also of major concern. Extension is involved at all levels in educating producers, land owners, and the general public on how to best manage fertility and prevent unwanted washoff or leaching of fertilizer materials.
- b. “Neuse Basin stakeholders have a top priority of being brought into compliance with new state water quality regulations. Cooperative Extension and other state agencies, as part of their role on the Neuse Basin Oversight Committee, have successfully partnered with local citizens which are affected by the regulations to develop workable nitrogen reduction plans. These plans, which will be implemented over the next 2 years, will achieve an overall 30% reduction in nitrogen contributions from farms, and nurseries, and other agricultural operations.”

“Many lawn care companies and landscapers make mistakes in pesticide and fertilizer application. This pollutes the environment and often puts homeowners and other green industry workers at risk. The Certified Landscape Technician program was implemented in Wake County in cooperation with the NC landscape Association. The program is designed to promote professionalism in the landscape industry and conserve and protect our environment and natural resources. The agent assisted in recruiting 66 landscapers and community college teachers who participated in a review and then took the exam. The agent provided training at the review and judged the exam. The program requires knowledge of the safe use of pesticides, fertilizer spreader calibration, plant identification, planting techniques, irrigation repair, irrigation design, safe use of equipment, and reading a landscape plan. 75% of the participants passed the exam.”

- c. State Specific

FTEs & Program Cost for Goal 4

State FTEs - 34	County FTEs - 68	program cost \$4,579,017
NCCES FTEs -State 33.8	County - 67.9	Program cost- \$4,566,717
NC A & T FTEs - State .2	County - .1	Program cost- \$12,300

Goal 5. ENHANCED ECONOMIC OPPORTUNITY AND QUALITY OF LIFE FOR AMERICANS

Empower people and communities, through research based information and education, to address the economic and social challenges facing youth, families, and communities.

Overview:

North Carolina is a very diverse state in terms of population, industry types, and agricultural commodities produced. The 6.8 million people who live in the state are diverse in terms of racial make-up (Spanish speaking, African-American, and Native American residents), age (infants, youth, working age, and retirement age), and financial well being. North Carolina has a wide variety of industries contributing to the general economy ranging from the fisheries on the coast, to the Christmas tree industry in the mountains, to the furniture manufacturing in the Piedmont, to the farming industry that spans the state. There are large industrial components as well as a rapidly increasing cottage/small business component.

The diverse population described above face many social and economic challenges. Some of these challenges stem from the fact the world now functions in a global economy rather than the local economy that was the situation in the past. Consequently, there is a real need for citizens of North Carolina to understand the interrelationships between what happens in the economies of other countries and how that might affect our economy. Some of the challenges are due to the increased cost of living that has forced the “second spouse” to enter the work place. This puts more stress on the family unit as well as creating a real need for improved child care, and more child care providers. Other challenges occur as a result of North Carolina becoming a prime “retirement state” as well as experiencing an aging population of its own. Some challenges are the result of a society that is three to five generations removed from actual production agriculture, and this has resulted in a society that is less understanding and less appreciative of production agriculture. An impending major change in the tobacco industry is causing a large amount of economic uncertainty and emotional stress for many farm families. Still other challenges are the result of citizens’ growing concern for a quality environment which has led to

increased regulatory legislation. These and other social and economic challenges put North Carolina youth, families, and communities at risk.

The youth, families, and communities of North Carolina are at risk of failing to reach their fullest potential because they face the economic and social challenges characterized above. Improved understanding of the economic and social issues that exist today, and the necessary leadership skills to face and meet these challenges is at the foundation of the Extension educational program in North Carolina. North Carolina Cooperative Extension has designed and is delivering an inclusive educational program to the diverse audiences outlined above which improve the likelihood that they will reach their full potential. Continual evaluation of existing programs will insure that all facets of the citizenry will be reached with our educational programs and that the programs meet the needs of the diverse clientele.

North Carolina Cooperative Extension's state and county unit based professionals made major impacts in the year 2000 in five "key theme" program areas: child care, 4-H Youth Development, family resource management, aging/estate planning/retirement planning, and community development.

Key Theme - Child Care

- a. Sixty-eight county Extension units submitted 82 reports of efforts to insure the child care professionals in North Carolina will provide safe, nurturing, appropriate programs for children. Thirty-nine county Extension units submitted 43 reports of efforts to increase the amount of quality child care as a result of improved collaboration among county agencies, increased resource development and the education of business leaders, court officials, school and private.
- b. Impacts:
Fifty-five thousand, three hundred and fifty-seven children in quality child care demonstrated improvement in social-emotional, cognitive, and physical development as reported by parents, providers, and school personnel. Twenty-five thousand, eight hundred and sixty-three hours of training were provided to 3,610 school-age care providers. Two thousand, six hundred and eighty-five of those reported an increase in knowledge, attitude, and skill. Forty-one thousand and forty hours of training was provided for 8,109 center care professionals. Six thousand, three hundred and thirty-eight reported increases. Ten thousand, two hundred and seventy-three hours of training was provided to 2,885 family child care providers. Two thousand and twenty-one reported increases. One thousand, four hundred and sixty-eight volunteers worked 21,619 hours at a value of \$216,190. The value of the program to society is \$5,491,454.

Three thousand, eight hundred and twenty-nine new child care slots were created, and 97 new centers/homes were brought on-line as a result of Extension efforts. Three thousand, seven hundred and eighty-six current providers increased knowledge. Extension managed \$1,448,737 while generating an additional \$794,138 through partnerships.

Key Theme - Youth Development 4-H

- a. Ninety Extension units submitted 111 reports on long-term support systems to develop competent youth. Sixty-one county Extension units submitted 66 reports to support youth involved in targeted knowledge transfer development activities which will demonstrate improved academic performance.
- b. Impacts:
Youth demonstrated increased life skill capacity in the following numbers: self-confident - 58,479; making decisions - 35,671; communication - 39,408; managing relationships - 31,197. Seventeen thousand, two hundred fourteen families were actively involved in 4-H through 1,466 4-H clubs. Two hundred forty-one thousand, one hundred fifty-six youth participated in all forms of 4-H.

One thousand, eight hundred and fifty-four school teachers increased their knowledge. Thirteen thousand, seven hundred and three students experience some change in academic performance, while 5,107 show great improvement. Seven thousand and seventeen demonstrated some improvement in homework completion while 4,519 show great improvement. The quality of homework showed some change for 7,131 students, while 4,194 had great improvement. Thirteen thousand, seven hundred and twelve students showed some change in science grades, while 6,812 had great improvement. School systems reported a savings of \$144,865 as a result of using 4-H school enrichment materials.

Key Theme - Aging / Estate Planning / Retirement Planning

- a. Thirty-two county Extension units submitted reports on efforts to accomplish the following objective, "Participants in aging issues programs will increase awareness, gain knowledge, change attitudes, develop skills, and adopt practices and behaviors to help make their later years more financially secure to include, but not limited to, financial planning, estate planning for individuals and family owned businesses, preparing for dependency, retirement planning, and consumer fraud against the elderly.
- b. Impacts:
Two thousand, seven hundred and thirty-nine participants improved financial status through adoption of consumer and financial management practices. A total of \$332,151 in increased saving and/or retirement contributions were generated. Seven hundred estate plans were developed and implemented. Seven hundred and two plans for possible future incompetency / dependency were developed.

Key Theme -- Community Development

- a. Thirty different counties of the 101 in North Carolina reported organized efforts in to increase citizens' awareness of economic trends affecting local economics; to increase special audiences skills to participate in the community development process, and to have citizens use economic development concepts to implement policies promoting sustainable economic

development. Eleven of these counties reported efforts to encourage the development of home based business plans, to encourage new business starts, and to encourage participation in community economic development programs.

b. Impacts:

Fifteen Hundred Twenty One persons attended conferences where they received information concerning economic conditions and economic trends for their local communities. Twenty Four counties reported that due to efforts to increase awareness of opportunities, and improved skills of special audiences; 772 persons participated in local public hearings, 266 participated in the voting process, and 214 joined the local labor force; 527 citizens attended conferences to increase their skills and abilities to use economic development concepts to implement policies to promote sustainable economic development in their local communities. Ten new businesses were attracted to their counties as a result of this educational effort. Eleven counties reported over 560 persons attended workshops where they gained knowledge of collaborative and cooperative marketing and how to construct marketing and business plans. As a result there were 16 new business start-ups with an estimated payroll of \$79,600 and there was reported that 13 small and home base businesses developed business plans. The value to the local communities that was reported by these 30 counties was \$5.4 million.

Citizens from varying socio-economic levels gained knowledge and skills that facilitated their participation in community problem solving and in local decision-making. Local citizens (1955) improved their problem solving skills with 610 taking action and participating in the community/public policy process as a result of the training they received. A number of community issues (214) were addressed. O of those was resolved successful, local communities were spared \$136,692.00 in cost.

Key Theme -- Community Development

a. Limited resource and other non-traditional participants (5745) were involved in leadership training. The participants identified community problems and took steps to solve them.

b. Impacts:

Their actions resulted in 583 problems being resolved or projects completed to address the problems. To continue finding solutions to problems, these individuals formed 227 community organizations.

Many volunteers increased their capacity to lead and contribute valuable service to others. Those increasing knowledge they could pass on to others totaled 25,288. A number of these volunteers became part of volunteer management systems (733) where their advanced skills were used to facilitate the accomplishment of community projects or build skills in youth and adults that enhanced their personal development.

Key Theme -- Family Resource Management

a. Thirty-four counties reported that they conducted programs to increase individuals' and families' knowledge of and ability to implement financial planning techniques, and to adopt best management practices that would enable them to meet their changing needs and

responsibilities over their life cycle. These 34 counties also reported that they focused programming efforts toward the limited resource individual and family audience. These efforts were intended to increase their awareness and knowledge of money management practices, to change their attitudes towards developing and using money management plans, and to have them adopt decision-making practices that would help them achieve their family financial goals. Twenty county extension units reported efforts to increase the awareness, knowledge, and skills of individuals and families to adopt best management practices to extend or increase their current incomes to meet their changing needs.

b. Impacts:

While the number of persons who actually increased their knowledge of the value of financial planning numbered 3982, the number who actually demonstrated success in the planning process was 1631. An additional 1188 persons reported ongoing success in implementing goal setting, family budgeting, and record keeping. There was an additional 664 persons who actually developed and implemented a "life cycle plan." These thirty-four counties reported that as a result of conducting best management financial planning educational programs, 946 persons reported improving their financial status. These persons reported that they had collectively reduced debt by an estimated \$108,889, and had increased their savings/investments by \$400,385.

There were 5231 persons in the limited resource audience who increased their awareness and knowledge about money management and the decision making process. 2028 reported that they actually developed written financial goals. 1654 reported that they developed money management plans, and 1072 reported that they had actually attained their goals. In addition, 1199 people in this audience reported that they had saved an estimated \$70,500 and had reallocated an additional \$38,500 to meet family needs. 806 person indicated that they had reduced their debt by over \$73,000.

Twenty counties reported that their efforts to educate individuals and families about the benefits of best management financial practices, and the techniques of how to implement these practices to extend and increase their current income reached 4891 people and resulted in 1945 persons actually extending their income by over \$175,200. There was also 1093 individuals who demonstrated appropriate decisions making regarding their employment situation and increased their income by an estimated \$365,411. Another 641 individuals indicated that they improved their self-employment situation after participating in these educational efforts by an estimated \$64,558.

FTEs & Program Cost for Goal 5

State FTEs - 22.06	County - 151.67	Program cost \$6,449,029
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NCCES FTEs -State 21	County - 150	Program cost- \$6,352,609
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NC A & T FTEs - State 1.06	County - 1.67	Program cost- \$96,420
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B. Stakeholder Input Process

An ongoing system of securing stakeholder input in program planning, implementing, and quality assessment has and continues to be a primary commitment for North Carolina Cooperative Extension. An Advisory Leadership System is functional in each of the 100 counties in North Carolina. The system includes an Advisory Council and many specialized committees. The Advisory Council represents geographic, cultural and economic diversity within communities of the county. Its function is to provide overall programmatic review, conduct environmental scans and needs assessment for program direction, and help market extension. The specialized committees provide specific program input for individual commodities, issues and ongoing program needs. Membership on both the council and the specialized committees represents the diversity of the respective county population to include under-served populations. While the advisory council will meet quarterly, the specialized committees will meet at least annually to discuss accomplishments and needs still to be addressed. This system is monitored administratively to assure that stakeholders provide such program input and actions.

At the state level, a Statewide Advisory Council provides programmatic inputs, review and guidance for the overall program functions of the North Carolina Cooperative Extension Service at N.C. State University. This group meets quarterly as well as for other special meetings to meet organizational review and input needs. This Council is made up of influential individuals who represent a broad scope of the diverse population in North Carolina and who have distinguished themselves as respected and responsible knowledgeable leaders who can provide local perspectives into a statewide organization. In addition to being an integral part of the overall State Advisory Council, the Extension Program at NC A&T SU is also guided by a cadre of citizens who make up the Strategic Planning Council. The Strategic Planning Council includes community leaders, agribusiness persons, teaching faculty, cooperative extension team members and individuals representing non-governmental organizations.

The Strategic Planning Council meets three times a year as a group. Networking and collaboration between the State Advisory Council and the Strategic Planning Council is facilitated by two members who serve on both Councils. Members of each Council periodically meet jointly.

With these organized groups functioning as a planned emphasis on significant stakeholder input into program direction, a planned and proactive process is operational that assures that programs are reviewed and overall needs assessed on a continuous basis, but no less than once every two years, with greater frequency encouraged. However, with the functioning of the respective advisory groups on a much more frequent basis, stakeholder inputs are producing a continuous process of program review and adjustments as local needs change.

To further assure appropriate, inclusive, and adequate stakeholder input, an environmental scan was implemented in each of the state's 100 counties to assure that sufficient inputs be provided with a scope of representation needed for effective program priority-setting. This environmental scan

surveys county residents, the total advisory system, commodity groups, other clientele, and volunteers.

Each of the 101 county administrative units (100 counties and Cherokee Indian Reservation) of Cooperative Extension in NC completed an environmental scan in the spring of 2000. A total of 4,898 individuals served on scan teams and included representatives from Extension staffs, advisory leadership members, specialized Extension committee members, clientele, volunteers, commodity group members, local decision makers, and other government agency members.

Data were collected from 20,720 individuals in assessing the needs, issues, trends/emerging issues. Groups supplying data included: county residents, environmental groups, local decision makers, local government agencies, commodity groups, volunteers, clientele, advisory leadership members, and Extension staffs.

County environmental scan teams used twelve major techniques to collect data in their respective areas. Major techniques included: focus groups, committee meetings, nominal groups, community forums, mailed questionnaires, personal interviews, existing information, previously administered surveys, available data from other agencies, group meetings, civic club meetings, and environmental group meetings.

Information collected through the environmental scans was used in the review of on-going Extension programs. Scan data were the bases for adding, deleting, and modifying current programs.

C. Program Review Process

The Long Range Plan Steering Committee, with members representing NCSU and NC A&TSU, is the primary merit review group for the POW. Additionally, the co-chairs of each of 20 state plan teams are merit reviewers. The state program leaders and the assistant administrator for state programs also serve as reviewers. The other merit review group is the POW goal chairs. Collectively, these individuals provide a significant internal merit review of programs taking into consideration the needs and expectations expressed in the stakeholder input process. There has been no significant changes in this plan since the initial AREERA 5 year plan was submitted.

D. Evaluation of the Success of Multi and Joint Activities

Multistate:

For fiscal year 2000, NCCES had documented multistate activities using Smith-Lever B & C funds amounting to \$156,223. This funding level exceeded the originally planned expenditure of \$106,075 by \$50,148. Altogether, the 2000 plan indicated 12 activities. The plan indicated an additional two activities to begin in 2001, making a total of 14.

While NCCES conducts a vast number of multistate collaborative programs, the numbers of activities that could be identified as the multistate requirements were released in 2000 showed that these were the only activities that met all the AREERA requirements at that time. During the 2000 fiscal year, two or those originally planned activities failed to meet the AREERA requirements. However, two additional activities were identified, with one producing results in 2000 while the other will produce reportable results for 2001, with both becoming a part of the NCCES plan. The two other activities planned to begin in 2001 are on target, with financial goals also on target to meet the plan. Unfortunately, the difficulties associated with the Orchard Floor Management Program as indicated in the following report will preclude that program from continuing as a part of the NCCES multistate plan. Loss of the personnel associated with this activity coupled with severe budget shortfalls has resulted in hiring freezes which will prevent the refilling of this position with personnel using Smith-Lever funds for the foreseeable future.

Efforts continue to identify additional multistate activities which are meeting or plan to meet the AREERA requirements. Such activities will be subsequently added to the plan and reported upon as appropriate. The key point is that NCCES has significant multistate activities underway on a continuous basis which strive to meet the needs of clients in a most efficient and effective manner. Some of these programs are partnerships with only one other state, while others are with a vast number of states. Utilization of scarce resources by pooling expertise and conducting Extension programs across state lines is a continuing part of the NCCES mission and continuing opportunities shall be sought and subsequently reported.

Evaluation of the multistate activities is an ongoing function of program leaders and other administrators of NCCES and other states, as well as by users and cooperators with whom the multistate activities are focused upon. Such evaluations as to the utility of current activities and expansion of such activities shall be a continuous function of NCCES.

Integrated:

Altogether, NCCES and NCARS fund more than 100 integrated Research- Extension projects. Of those projects, 27 have Smith-Lever B & C funding allocated for all or part of the Extension funding. For fiscal year 2000, these B & C funds amounted to \$832,460. This funding level exceeded the originally planned expenditure of \$747,785 by \$84,675.

While the integrated projects have a greater focus on Goals 1 and 4, some projects are reported under Goals 2 and 5 as well. All of these projects represent goals to achieve scientific breakthroughs for production efficiencies, environmental protection, life enhancement, stronger communities, and alternative uses of products to achieve a greater contribution to the economic, environmental and quality of life benefits to society.

These integrated programs strive to gain new and improved technological advancements that can be communicated and applied to meet the needs of the population as a whole as well as for those individuals and organizations who adopt the new advancements.

These integrated projects have been developed using stakeholders inputs and are evaluated to assure that all programs represent the needs of the people of the state in protecting its environment, increasing its economic well being and enhancing the society in which the state's population lives. Needs assessments and stakeholder involvement helps to establish priority

projects for funding. Efforts are made to address the needs of all of the state's citizens, with these programs effectively communicated via Extension programs to under-served and other citizens of the state who can utilize the findings for enhancement of the quality of their lives.

E. MultiState Extension Activities

North Carolina Cooperative Extension Service AREERA 2000 Multistate Activities Report
(Smith-Lever B & C funded)

Goal 1. AN AGRICULTURAL SYSTEM THAT IS HIGHLY COMPETITIVE IN THE GLOBAL ECONOMY

Program 1.

SERA-IEG
Competivness and Sustainability of the Southern Dairy Industry

Amount funded: 0

Report: This project continues as a viable multi-state Extension program. However, its funding was from sources other than Smith-Lever B & C funds for 2000. Plans are to readjust funding so that appropriate B & C funds support this project in the Southern region for 2001 and later. SERA-IEG states are VA, NC, SC, GA, FL, KY, TN, AR, AL, MS, LA, TX, & OK

Program 2.

Regional Orchard Floor Management Program

Serves the educational needs of growers in the North Carolina, South Carolina and Georgia mountain region.

Amount funded: 0

Report: This project continues as a viable multi-state Extension program. However, due to personnel losses, no B & C funds were allocated to this program for 2000. Future funding for this multi-state project is under review based on personnel and funding availability.

Program 3.

Southern Region Small Fruit Center

Specialized assistance provided to small fruit growers in North Carolina, South Carolina, Georgia, Virginia, and Arkansas.

Amount funded: 0				
2000	2001	2002	2003	2004
0	\$27,500	\$28,800	\$30,500	\$32,000

Report: This ongoing multistate project is planned to be restructured in 2001, to be partially supported by B & C funds for 2001 and succeeding years

Program 4.

Pork Industry Handbook

A consortium of states involved in developing an informational handbook for pork producers across the country.

Amount funded: \$10,108

Report: The Pork Industry Handbook (PIH) and CD-Rom is a national continuing educational effort on all phases of pork production. The PIH is a multidisciplinary project with over 80 authors and reviewers that include animal scientists, veterinarians, ag engineers, ag economists and pork producers from 45 states. It is currently estimated that 99% of all the hogs produced in the United states come from production units that utilize some or all of the PIH fact sheets. In addition, the PIH is used as a textbook in over 100 college courses on pork production at nearly 70 colleges and universities in the U.S. States that have representatives directing the program through the PIH Advisory Committee include: North Carolina, Indiana, Nebraska, Illinois, Oklahoma, Iowa, Michigan, North Dakota, Ohio, Missouri, Georgia and Kansas.

Program 5.

Regional Vegetable Guide

This program involves the development and maintenance of an up-to-date technical and educational guide for commercial growers in North Carolina, South Carolina, Alabama and Mississippi.

Amount Funded: \$16,660

Report: Coordinated efforts for a regional (NC, SC, GA, AL, MS) vegetable production guide pest management supplement for 25 major vegetables and assisted with planning and conduct of a SE regional meetings of all Ext. Vegetable Specialists to develop production recommendations.

Program 6.

SARE Professional Development Program

The SARE Professional Development Program involves growers and faculty from NC, MS, AR, FL, LA, TN for preparing traditional providers for delivery of sustainable agriculture

Information.

Amount funded: \$15,927

Report: The outcome of this program should improve collaboration among stakeholders-especially among traditional information providers (CES, NRCS) and non traditional sources of sustainable agriculture information, identify ways to familiarize agents with the depth and breadth of sustainable agriculture materials available, and identify the means for making those materials more readily accessible through creative use of web-based electronic resources.

Program 7.

Pork Production Curriculum Project

Course curriculums are being developed and implemented for all phases of pork production that are designed to address the basics of day-to-day management activities. The basic management principles are similar no matter what type of facility the grower may be using or how large or small the size of the unit. The intended audience for these curriculums is the group of people who work in the production of any type, size or kind size of pork production operation. The student may be an employee in contract production or an owner-operator. States participating include: North Carolina, Ohio, Minnesota, Tennessee, Alabama, Nebraska, Indiana, Iowa, Illinois, Maryland, Washington, South Dakota, Kansas, Georgia, Kentucky, Virginia and Pennsylvania.

Amount Funded, 2000: 0

Funding planned for 2001: \$20,000

Report:

The Breeding and Gestation Herd Management Course has been developed and pilot tested at NCSU based on the national Breeding and Gestation Herd Management Curriculum. Producers from North Carolina, 16 additional states (AK, AR, CA, FL, GA, IA, ID, IN, IL, MI, MN, MO, NE, NH, OH, OK), Ecuador, Colombia and the Philippines participated. In survey results at the completion of the course 100% of the participants agreed that Breeding and Gestation Herd Management provided him or her with an opportunity to improve their job skills. When asked about their improvement of knowledge on 14 key concepts the average responses ranged from 2.0 to 2.5 for every concept where 1 is Strongly Agree and 5 is Strongly Disagree. Furthermore 46% of the completing students indicated that they planned to make changes in their breeding and gestation barn practices based on information they learned in Breeding and Gestation Herd Management.

Goal 2.A SAFE AND SECURE FOOD AND FIBER SYSTEM

Program 1.

The Poultry Food System: A Farm to Table Model"

The primary objective of the project is to improve consumer safety, consumer acceptance and the commercial profitability of poultry meat and eggs by improving or reducing critical problems associated with the quality of poultry meat and eggs, specifically color, flavor, or texture of the product, and the safety of poultry meat and eggs, specifically colonization, contamination, and subsequent pathogen growth. Twelve states involved.

Amount funded: 0

Funding planned:

2000	2001	2002	2003	2004
0	\$42,900	\$45,100	\$46,900	\$48,800

Report: This project is planned to be implemented in 2001 and succeeding years.

Goal 3. A HEALTHY, WELL-NOURISHED POPULATION

Program 1.

Partners in Wellness

Nutrition education for the elderly, a program involving North Carolina and Georgia in a collaborative arrangement for program development and implementation.

Amount funded: \$36,340

Report:

NCCES is collaborating with the University of Georgia at Athens in program development, implementation and evaluation of impact, appropriateness for the audience and process evaluation. Georgia has initiated three modules of PIW in 24 sites.

We are also collaborating with Michigan in program development, implementation, and evaluation of impact, appropriateness for the audience and evaluation of impact. Michigan is planning to develop an additional module based on the feedback we provided them. We are also collaborating with Kansas State U. in that we are providing curriculum of PIW in which they have adapted it into newsletters to be distributed throughout their state.

Selected outcomes include:

There was a significant increase in PIW participants in: stage of change for fruit and vegetable consumption ($p < 0.05$); in improved diet to prevent chronic disease ($p < 0.01$); in self efficacy for ability to dine with others; and in the use of the Food Guide Pyramid to help plan meals ($p < 0.05$).

A train-the-trainer program was developed and delivered to determine if using Congregate Nutrition Site (CNS) managers in a train-the-trainer program would be an effective method of delivering nutrition education to CNS participants and if it would increase the manager's self efficacy. Outcomes included positive self-efficacy changes in CNS managers in their ability to educate others ($p < 0.05$) and behavior changes in participants in using a grocery list to shop ($p < 0.05$) and comparing prices of food items while shopping ($p < 0.05$).

Partnerships were fostered across state lines as other state universities requested to collaborate with PIW and to deliver the program or a component of the program in their states. These included Georgia at the University of Georgia, Michigan at Michigan State University, Kansas at Kansas State University and Pennsylvania at Penn State University. Consultations through conference calls and meetings (in North Carolina, Georgia, and South Carolina) were held with the North Carolina PIW staff. The PIW curriculum was shared with each of these partners.

Program 2.

Elderly Extension Core Group

A program focusing on planning curricula, program delivery means and expertise in elderly nutrition programs. The states of North Carolina, Florida, Kansas, Missouri, Ohio and Virginia participate.

Amount funded: \$3,700

Report:

NCCES faculty chair the Elderly Nutrition Education (ENE) Coordinating core group composed of members from Florida International U., St. Louis U., K -State U., the USDA Center for Nutrition Promotion and Policy, Texas (retired Extension nutritionist) and the Ohio State University. Our goals are to support and advance the understanding, research base and promotion of nutrition education for the older adult audience. This group's efforts are increasing the awareness level of other professionals concerning the nutritional needs of older adults. Nutrition education materials (HELP: The Healthy Eating for Life Program), have been developed and tested in Kansas, North Carolina and Ohio. These HELP materials were revised and disseminated across the U.S. Extension Service. We also conducted a symposium at the annual meeting of SNE that drew over 80 participants from across the country and internationally and was marketed on the web. This past year we co-authored 7 research papers concerning nutrition education and older adults, we are guest editors for special issues of two prestigious journals, the Journal for Nutrition Education for the Elderly and the Journal of Nutrition Education, we introduced a resolution at the Society for Nutrition Education (SNE) in support of elderly issues, During 2000 we not only presented papers at national meetings including SNE and the Southern Gerontological Society but also submitted and were accepted to present at two conferences in 2001, The First Joint Conference of the American Society on Aging and the National Council on Aging; and the Southern Gerontological Society annual meeting.

Goal 4. AN AGRICULTURAL SYSTEM WHICH PROTECTS NATURAL RESOURCES AND THE ENVIRONMENT

Program 1.

Regional Forestry position

A consortium of all Southern Region states for forestry program leadership and coordinative efforts in linking programs from each state to more effectively streamline the flow of information across the region

Amount funded: \$12,721

Report:

This position has facilitated the implementation of communication among the various states in the Southern Region, assisted with the development of regional NREM programming presence and recognition, instrumental in the creation of a national organization representing natural resources extension programs. These efforts have created better collaborations and understanding among diverse program areas, including enhanced partnership for states with the US Forest Service.

Program 2.

Environmental Protection Agency liaison Specialist

A consortium of 8 Southern states for coordinating Extension programs with EPA and other federal agencies relating to the environment.

Amount funded: \$4,750

Report:

This position has served as an information broker for directors and program leaders on water quality and other related environmental issues. There has been promotion of training and other conference opportunity which enhances each states ability to collaborate on water quality issues and communicate with EPA.

Goal 5. ENHANCED ECONOMIC OPPORTUNITY AND QUALITY OF LIFE FOR AMERICANS

Program 1.

Southern Rural Development Center

Programs focus on fostering the economic and community development in the rural South.

Amount funded: \$1,857

Report:

The Southern Rural Development Center has greatly enhanced the capability and effectiveness of Cooperative Extension in the Southern Region as a whole by coordinating and facilitating conferences and meetings. They have also met effective programming goals by facilitating CRD and ANR program leaders in the implementation of a regional conference on building quality communities - the first of its kind for Cooperative Extension. The overviews, white papers and other publications from the SRDC are effective educational items that draw on the expertise of various states and subsequently shared with the other states in the region. The regional community development institute has prepared and equipped extension faculty to do effective community development programming at the local level.

Program 2.

School Age Child Care

A multistate program dealing with the educational needs of school age youth

Amount Funded: \$24,508

Report:

The Extension Cares Initiative Management Team is building an infrastructure to support states who decide to work on this initiative. The May 2000 Roll-Out Conference was the first step to building this infrastructure. The three program committees, Early Childhood, School-Age Care, and Teens in Out of School Time, are developing strategies to work with states that developed plans of work at the conference. The Evaluation committee is building a web-based system to help states report their impact data and allow states and national folks to access data for reporting purposes. A Technology committee is developing innovative strategies the Management Team can use to support states and fully implement the Initiative work.

Under-served and under represented populations are targeted. Impacts will be documented once states implement and evaluate their state plans.

All states and territories are involved except AS, GU (Univ. of Guam), MC (College of Micronesia), MT, ND, PR (Univ. of Puerto Rico), RI, and VI.

Program 3.

4-H Volunteer Leadership Development Forum

A multisate program designed to train more effective leaders for youth programs.

Amount funded: \$21,572

Report:

The Southern Region 4-H Leader Forum is an annual event which boasts attendance by more than 700 volunteers and 4-H staff members from 13 southern states and territories (Virginia, North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, Texas, Oklahoma, Arkansas, Kansas, Kentucky, Tennessee, Puerto Rico and the Virgin Islands). The primary purpose of the regional 4-H volunteer forums is to increase the capacity of volunteer and salaried staff to contribute to the achievement of the mission of 4-H Youth Development Education and the Cooperative Extension System as a whole. It is expected that participants will increase their understanding of the 4-H mission, gain new ideas and perspectives related to youth development education, expand their horizons and increase their effectiveness and competence, share their learning experiences with others throughout the region, develop a stronger commitment to the 4-H program, and enjoy the experience of interacting and exchanging ideas with those from states, territories and provinces.

Program 4.

CYFERNet-Parent/Family Editorial Board

A board to guide the programs and activities of children, youth and families programs at 25 universities. The Board includes persons from 8 states.

Amount Funded: \$8,080

Report:

As a member of the National Parent-Family Editorial Team, we have been working hard to mine the cooperative extension resources of states. These have been catalogued and compiled for a new database to be introduced in March, 2001. This was the initial goal of the team. These materials will be made broadly available through the INTERNET and in particular to CYFAR project leaders who are serving under-served and under represented populations through community educational programs. In particular, we have identified publications on family issues for low literacy audiences and Spanish speaking audiences.

It is expected that access to these peer-reviewed educational materials and the accompanying training will enhance educational programs to families in communities. Through the CYFAR reporting structure, the outcomes and impacts of these efforts will be documented and shared in the coming year.

The states directly involved in this program are:

North Carolina, Arkansas, New York, Vermont, Florida, Illinois, Idaho and Maine.

Summary:

Total Extension Multistate Programs: 16

Total Smith Lever B & C funding planned: \$106,075

Total Smith Lever B & C funding allocated to 14 programs for FY 2000: \$156,223

**U.S. Department of Agriculture
 Cooperative State Research, Education, and Extension Service
 Supplement to the 5-Year Plan of Work
 Multistate Extension Activities and Integrated Activities
 (Attach Brief Summaries)**

Institution N.C. Cooperative Extension Service
 State North Carolina

Check one: Multistate Extension Activities
 Integrated Activities (Hatch Act Funds)
 Integrated Activities (Smith-Lever Act Funds)

Actual Expenditures

<u>Title of Planned Program/Activity</u>	<u>FY 2000</u>	<u>FY2001</u>	<u>FY2002</u>
<u>Goal 1. A highly competitive</u>	<u>42,695</u>	<u> </u>	<u> </u>
<u>Agricultural System</u>	<u> </u>	<u> </u>	<u> </u>
<u>Goal 2. A safe and secure food</u>	<u>0</u>	<u> </u>	<u> </u>
<u>and fiber system</u>	<u> </u>	<u> </u>	<u> </u>
<u>Goal 3. A healthy, well-nourished</u>	<u>40,040</u>	<u> </u>	<u> </u>
<u>population</u>	<u> </u>	<u> </u>	<u> </u>
<u>Goal 4. An Agricultural system</u>	<u>17,471</u>	<u> </u>	<u> </u>
<u>protecting natural resources and</u>	<u> </u>	<u> </u>	<u> </u>
<u>the environment</u>	<u> </u>	<u> </u>	<u> </u>
<u>Goal 5. Enhanced economic</u>	<u>56,017</u>	<u> </u>	<u> </u>
<u>opportunity of quality of life</u>	<u> </u>	<u> </u>	<u> </u>
Total	<u>156,223</u>	<u> </u>	<u> </u>
<u>Certified by Jon F. Ort</u>	<u>3/5/2001</u>		
Director	Date		

Form CSREES-REPT (2/00)

E. Integrated Research and Extension Activities

The following is the project/program names and brief descriptions of the NCCES Integrated Extension-Research programs, broken out by the respective Goal

**GOAL 1. AN AGRICULTURAL SYSTEM THAT IS HIGHLY COMPETITIVE
IN THE GLOBAL ECONOMY**

<i>Integrated Project</i>	<i>Project #</i>
Disease management for vegetables	5960
Ecology and management of European corn	0205
Weed management in turfgrass and forages	6453
Mycotoxins/effects on dairy cattle	6348
Production and management strategies to improve soybean seed quality	5399
Genetic improvement in pork production systems & understanding genotype by environmental interaction	6496
Contribution of lipids to the flavor of foods	6326
Nutrient cycling in vegetable cropping systems	6380
Plant establishment for vegetable production	6187
Economics administration	5142

Project 5960

Issue: Disease Management: Several plant diseases have the potential to cause serious defoliation and fruit rots on North Carolina's 21 million dollar fresh-market tomato crop.

Researchers developed and tested tomato fungicide usage strategies which alternate the use of strobilurin compounds, eg., Quadris, with traditional fungicides applied at extended spray intervals.

Tomato growers report that use of the spray program developed by this research provides better disease control and that their harvest period is now longer because of improved disease control.

Project 0205

Issue: Although insecticides have provided great benefit they have also had serious secondary effects (e.g. environmental, toxicity to off-target species. Transgenically altered plants can now more fully realize a long recognized, environmentally friendly approach for evading pests.

A collaborative group endeavored to come to a consensus on an insect resistance management policy and to develop a publication. It was necessary to collaborate with a diverse group of scientists (e.g. population genetics scientists, computer modelers, field entomologists, etc.). Issues were debated and ideas voted upon. The group developed a consensus for resistance management plans and the publication was written and published. Perhaps the most important impact is a heightened commitment to insect resistance management and a shared idea that all parties need to work together to accomplish the desired goal of preserving this valued technology.

Project 6453

Issue: Annual bluegrass continues to be the most troublesome pest for highly maintained turfgrasses. This is especially true on golf courses and particularly on putting greens. Research on the effects of PGRs on bentgrass lateral recovery from simulated injury has shown up to a 35% delay in recovery with certain PGR treatments whereas others have slightly increased recovery.

While this research is just beginning, new recommendations have already been developed for the 331,000 acres of managed roadside turf in NC.

Project 6348

Issue: Dairy producers must optimize the feeding program by properly utilizing farm-produced feeds, by improving silage production for greater yields and quality, by formulating rations that use ingredient analyses to supply the cow's nutrient needs at a minimal cost, by controlling the feeding procedures, and by controlling mycotoxins through a multifaceted approach in the field, in storage and in the ration.

Research continues to refine feeding and nutrition recommendations as dairy cows improve genetically. Feed testing for nutrient content and for mycotoxins has been made available to N.C. dairymen through the North Carolina Feed Testing Program at low costs. North Carolina continues to be in the forefront for research and extension activities on mycotoxin effects on dairy cattle.

Production responses to therapy have resulted in increases of 2 to 8 lb of milk/cow daily plus improvements in health and reproduction. Based on sampling and survey data, these programs may impact the profitability of North Carolina's dairy producers by \$15 million annually.

Project 5399

Issue: Many of NC's production practices must be critically reviewed and changed if we find we cannot consistently deliver high quality seed.

The objective of the seed extension/research program has been to enhance soybean seed quality through improved production and storage practices.

Educational efforts in the form of meetings, workshops, and publications have communicated to seed growers the importance making good management decisions and the consequences of making bad ones. Following our recommendations will result in increased seed quality, will allow seed growers to meet company standards, and will allow soybean producers to reduce seed input costs. Information generated from the on-farm early planting date study demonstrated that yield and quality can suffer if soybeans are planted in April or if early (group III) varieties are planted.

Project 6496

Issue: Genetic selection is a primary driver in advancing the swine industry by improving

productivity, reducing cost of production and meeting consumer demand.

A genetic advisory committee comprised of individuals from seven universities (NC, IA, IN, MI, NE, GA and TN) was formed to develop a comprehensive genetic evaluation system for the Yorkshire, Duroc, Hampshire and Landrace breeds of swine.

The average genetic improvement over all four pure breeds (Duroc, Yorkshire, Landrace and Hampshire) for days to market and backfat depth was a reduction of 2.7 days and 4.5 mm, respectively. While kg of lean, number of pigs born alive and 21 day litter weights have been genetically increased by 1.36 kg, .25 pigs, and 1.3 kg, respectively. This is an economic improvement of over \$9.00 per pig.

Project 6380

Issue: Nutrient cycling in vegetable cropping systems

Continued studies on uses of various types of compost to enhance soil microbe development.

The use of reactor treated composted swine waste and controlled micro biotic compost improved crop growth and yield in the first year. We will continue this evaluation while reducing fertilizer additions with the aim of elimination of inorganic fertilizer sources in 5 years.

Project 6326

Issue: Contribution of lipids to the flavor of foods

Evaluated the influence of production steps on off-flavor in whey protein and demonstrated the impact of proteolytic and lipolytic enzymes from cultures on off-flavor.

Evaluated the impact of cheese flavor concentrates on the flavor of reduced-fat cheese.

Subsequent scholarly papers have been developed for dissemination of results.

Project 6187

Issue: Plant establishment for vegetable production.

During the early and mid-1990s, much of the inferior yields and quality obtained by growers who produced Beauregard in North Carolina was due to inferior planting stock. Seed stock is one of the most critical components in the success or failure of a planting operation.

Superior Beauregard clone/hill selections have been made, starting in 1994. In addition, virus and other diseases have been eliminated from the superior selections using tissue culture techniques with the establishment of the Micropropagation Unit at North Carolina State University. Virus tested Beauregard clones have been evaluated in several field tests for several years in several locations to select clones with the best yields and quality.

With the availability of virus tested, superior sweetpotato planting stock of several clones, the best sweet potato planting stock in the United States is available to North Carolina commercial sweet potato growers. Four Beauregard superior clones were available as of fall, 1998, while one Hernandez clone was made available early in 2000. Over one-half of the acreage in North Carolina was derived from these improved, virus tested, micropropagated clones in 2000.

GOAL 2

A SAFE AND SECURE FOOD AND FIBER SYSTEM

A comparison of tournaments and payment schemes in poultry contacts

6527

Improvement of thermal processes for foods; Aseptic processing and packaging studies	0836
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Project 6527

Issue: A comparison of tournaments and payment schemes in poultry contacts.

The first phase of the research program “Economic Effects of Regulating Broiler Contracts” has been completed. A scholarly article entitled “Regulating Broiler Contracts: Tournaments versus Fixed Performance Standards” is accepted for publication in the American Journal of Agricultural Economics.

Project 0836

Issue: Improvement of thermal processes for foods; Aseptic processing and packaging studies.

Work continues on multiple magnetic ID tagging for particle residence time characterization in multiphase aseptic systems. Recent efforts focus on thermal characterization of particle cold spot on-line real-time. On-line real-time package seal integrity testing studies continues, as well as system development work for color recognition of maturity profiling of field crops-web based. Scholarly articles have been produced for contribution to the scientific body of knowledge.

GOAL 4 AN AGRICULTURAL SYSTEM WHICH PROTECTS NATURAL RESOURCES AND THE ENVIRONMENT	
Environmental nursery crop production	6224
Influence of water management; Restoration of converted wetlands	6427 9611
Integrated vegetation management in non-cropland	6305
Animal waste management	6423
Animal waste management processes to enhance treatment & use to reduce environmental impacts	6423
Plant nutrition programs for mountain crops	6558

Economics of reducing pollution; Waste treatment of swine	6443 9676
Soil fertility evaluation and nitrogen management of tidewater region soils	6458
Interior environment and energy use in poultry and livestock facilities	0291
Weed management for small fruits and vegetables	6327
Using tomato crops for recovering Bio-resources from swine waste	5885
Utilizing nitrogen by-products in beef cattle	5852

Project 6224

Issue: Ornamental nurseries that produce nursery crops in containers may use as much as 13,500 gallons of water per acre per day during the growing season.

Irrigation scheduling is the process of determining when to irrigate and how much to apply. The goal of irrigation scheduling is to control the water status of the crop to achieve a targeted level of plant performance.

Plant growth increased 57% when irrigation was applied in the P.M. compared to early morning irrigation.

Increasing plant growth 57% and 69% by scheduling irrigation throughout the day rather than the traditional early morning irrigation practices, could have dramatic impact on reducing time to produce crops, thus maximizing growth.

Project 6427

Issue: Agricultural drainage is a potential non-point source of pollution to the receiving rivers and streams, particularly those drained from lands used for animal waste disposal.

The transport of wastewater nutrients from land application fields was evaluated in a 3-year field study.

Poorly scheduled irrigations onto already wet fields resulted in more drainage transport in one event than occurred during extended periods when irrigation was properly scheduled onto dry fields. These observations suggest that irrigation scheduling and proper management were far more important to water quality than remedial actions such as controlled drainage or vegetative buffers.

Project 9611

Issue: The effect of riparian buffer vegetation type and width on groundwater quality in the

Middle Coastal Plain has not been well evaluated. This study was conducted to compare the effect of riparian buffer vegetation type and width on shallow groundwater quality in this region of North Carolina.

Implementation of riparian buffers without knowledge of the hydrology of the site may lead to minimal water quality benefits.

Project 6305

Issue: Develop improved management practices for invasive weeds growing in aquatic and terrestrial noncropland habitats. Seed germination and seedling viability testing indicated that the invasive woody species, princess tree (*Paulownia tomentosa*) potentially could be spread from seeds contained in immature fruits and moved about on mowing and earth moving equipment. Our initial research has shown that a small percentage of even very immature seeds will germinate and form viable seedlings. This suggests that special care should be taken during trimming and removal of these trees to prevent spreading to other areas. This information ultimately may change the management practices used for this species by utility companies and by the NC Dept. of Transportation and their contractors.

Project 6423

Issue: Continuing professional development opportunities provide professionals working with engineering issues in livestock waste management to be more competent in the services they are able to offer. In-service training workshops help agricultural agency representatives, agribusiness vendors, consultants, and regulatory personnel to better serve operators of animal waste systems, land application equipment, irrigation systems, production unit support systems, and waste treatment units.

A total of 250 participants successfully completed the recertification workshops receiving one hour of continuing education credit. They are now better equipped to help animal waste system operators reduce water consumption reducing water demand, reducing rate of lagoon liquid accumulation, and generating less wastewater to be irrigated and land applied.

Project 6423

Issue: Almost all agricultural sectors and many other municipal and industrial sectors use land application of production by-products and animal manure as an environmentally acceptable ways to recover the resources available while managing the waste stream.

During the 2000 training program over 7,350 operator contact hours were conducted at programs at or sponsored by the Training Center to fulfill the continuing education requirements for animal waste, spray irrigation, and residuals land application operators, as well as professional engineers, professional soil scientists and sanitarians. Additionally, 2,187 operator contact hours were conducted during other programs coordinated by NCCES field faculty.

Project 6558

Issue: Excessive height growth is a problem with many vegetable and ornamental species in a float system of plant production. Experiments have been conducted to solve the height control problems with tomato.

This project has identified species that can be produced in the float system, and has begun to solve height control problems. Float production of these species could lower production costs, and could utilize empty seedling greenhouses.

Project 6458

Issue: Runoff of nitrogen, phosphorus, and sediments from fields in the Tidewater region contribute to water quality degradation in the Albemarle-Pamlico Estuarine System. NCSU scientists have collaborated with producers to develop fertilizer response curves and strategies for precision management, water control, and reduced tillage to optimize returns and reduce runoff. The ongoing education of farmers and county agents can enhance voluntary adoption of best management practices needed to achieve nutrient reduction goals for runoff into rivers.

This would be a substantial N reduction, since the entire annual contribution of fertilizer N to the Albemarle-Pamlico Estuarine System has been estimated at 3 million pounds of N.

Projects 6443 & 9676

Issue: Economics of reducing pollution; Waste treatment of swine
Economic studies of the farm level impacts of transgenic crops and a study of the economics of swine waste management technologies are underway and nearing completion.

Project 0291

Issue: Interior environment and energy use in poultry and livestock facilities.
This project is focusing on quantifying odor, dust, and gases generated and emitted a greenhouse. The importance of these measurements are that as swine waste is utilized in this manner ammonia volatilization may occur and significant dust and odor may be generated. Building ventilation requirements will be based on these measurements. In addition, if high particulate levels are present or certain toxic compounds such as hydrogen sulfide, then an odor control system may need to be designed to clean the indoor air and potentially the exhaust air. Data collection continues.

Project 6327

Issue: Weeds continue to be one of the worst pests in vegetable crops. Pigweed, specifically Palmer Amaranth, is spreading across crop land in North Carolina. Because of the development of better scouting procedures and control programs, Palmer amaranth will have less impact on vegetable crops in North Carolina. Use of chemical controls that were developed will save \$20 to \$40 per acre of hand labor required to remove this weed from sweetpotato fields. In addition, 15 to 20% increases in yield and quality will be realized on fields infested with Palmer Amaranth from use of these control programs. Greenhouse studies also determined that most of the currently labeled herbicides are not effective in controlling Palmer amaranth.

Project 5885

Issue: Using tomato crops for recovering Bio-resources from swine waste. The project is currently on-going. Work continues in construction of these facilities. We are scheduled to perform odor, gas, and particulate analysis of air samples collected within the greenhouses and exhausted from the greenhouses once they are operating.

5852

Issue: Utilizing nitrogen by-products in beef cattle. The project, utilizing nitrogen by-products in beef cattle was completed in 2000. Its findings produced information to indicate that certain bio-solids do not produce positive nutritional opportunities for beef cattle feeding.

**GOAL 5
ENHANCED ECONOMIC OPPORTUNITY AND QUALITY OF LIFE FOR
AMERICANS**

Estimating impacts of community development options	6237
Commodities, consumers, and communities	0185
Youth and careers	6841

Project 6237

Issue: The overall objective of WECO (Watershed Education for Communities and Local Officials) is to improve water quality in the White Oak River through education of citizens and government officials who live and work in the watershed. Citizen educational programs have been implemented that generate support for improving water quality in the White Oak river, thus protecting the fishery and tourism resources dependent upon it. Additional funding has been obtained for implementation of BMPs.

Project 0185

Issue: Capacity building is a systematic approach to assisting organizations to play a major part in the regeneration of their communities

Social and economic data have been provided and analyses have been conducted with a wide variety of public and private organizations. Communities have investigated their strengths and weaknesses through a strategic planning process.

To address both community issues and problems in the service delivery system, many agencies are reworking their organization thought and practice to emphasize interagency cooperation, coordination and collaboration. Education, health and social services agencies are beginning to recognize that only by working together can they provide services that are integrated rather than fragmented, multi-dimensional rather than one-dimensional, and continuous rather than sporadic.

Project 6841

Issue: Career decision making. The program offers advanced instruction in youth career development coupled with hands-on research experience studying factors that affect youth careers including family, education and labor force issues. Youth

and Careers research focuses on critical career development issues. For example the project is studying rural high school students in North Carolina to determine how parents influence their sons' and daughters' career plans.

We present continuing education workshops for career counselors in high schools throughout the U S and abroad. To date, we have trained more than 4,000 counselors to use the program. We have written books and articles on youth and careers that are used widely in university classrooms

Summary:

Total Extension-Research Integrated Projects: 27

Total Smith Lever B & C funding \$747,785

Total Smith Lever B & C funding allocated to the 27 projects for FY 2000: \$832,460

**U.S. Department of Agriculture
 Cooperative State Research, Education, and Extension Service
 Supplement to the 5-Year Plan of Work
 Multistate Extension Activities and Integrated Activities
 (Attach Brief Summaries)**

Institution N.C. Cooperative Extension Service
 State North Carolina

Check one: Multistate Extension Activities
 Integrated Activities (Hatch Act Funds)
 Integrated Activities (Smith-Lever Act Funds)

Actual Expenditures

Title of Planned Program/Activity	FY 2000
<u>Goal 1. A highly competitive Agricultural System</u>	<u>337,491</u>
<u>Goal 2. A safe and secure food and fiber system</u>	<u>30,893</u>
<u>Goal 3. A healthy, well-nourished population</u>	<u>0</u>
<u>Goal 4. An Agricultural system protecting natural resources and the environment</u>	<u>382,620</u>
<u>Goal 5. Enhanced economic opportunity of quality of life</u>	<u>81,456</u>
Total	<u>\$832,460</u>

Certified by Jon F. Ort 3/5/2001

 Director Date