North Carolina

USDA GPRA and Cooperative Extension 3d Program Accomplishment Reports

1998

STATE UNIVERSITY
A&T STATE UNIVERSITY

North Carolina State University and North Carolina A & T State University USDA GPRA and Cooperative Extension 3d 1998 Program Accomplishment Reports

The reports contained herein represent program accomplishments for the five respective Government Performance and Results Act (GPRA) plan as indicated by those respective programs at North Carolina's two Land Grant Universities, N. C. State University and N. C. A & T State University. Extension, Research, and Academic Affairs Programs within the College of Agriculture and Life Sciences at N. C. State University and the School of Agriculture at N. C. A. & T. State University were responsible for developing the GPRA plan and the subsequent accomplishment report for 1998.

The respective GPRA Goals include:

Goal 1: To achieve an agricultural production system that is highly competitive in the global economy.

Goal 2: To provide a safe and secure food and fiber system.

Goal 3: To achieve a healthier, more well-nourished population.

Goal 4: To achieve greater harmony (balance) between agriculture (production activities) and (stewardship and protection of) the environment.

Goal 5: To enhance economic opportunities and the quality of life among families and communities.

Cooperative Extension 3d Programs

In addition to the five goals of GPRA, this report contains accomplishment reports for the Cooperative Extension 3d programs of EFNEP, Water Quality, Integrated Pest Management, Sustainable Agriculture, Pesticide Applicator Training, Pesticide Impact Assessment, RREA, and Food Safety.

NORTH CAROLINA 1998 ANNUAL REPORT:
OVERVIEW

ACCOMPLISHMENT OVERVIEW

GOAL 1 - TO ACHIEVE AN AGRICULTURE PRODUCTION SYSTEM THAT IS HIGHLY COMPETITIVE IN THE GLOBAL ECONOMY

This program assists producers by developing and encouraging the adoption of practices and enterprises that are profitable and enhance competitiveness in the global economy. In recent years, these efforts have broadened to encompass environmentally sound production strategies, and to a lesser degree to consider the social implications of contemporary agricultural systems.

New plant genetic material has been developed that provides resistance to common insect or disease pests of tobacco, peanut, corn, cucumber, and wheat. Other plant materials provide enhanced quality and/or yields of food crops. These developments not only provide the direct benefits just mentioned, but they also broaden the genetic base for continued genetic development. On the farm, our educational programs have documented that 4,100 growers planted genetically engineered crop varieties on 127,000 acres, increasing income by about $2.3 million and saving approximately $.7 million in pesticide costs.

More and more, our programs are focusing on taking a system-wide or integrated view at developing solutions to agricultural problems and opportunities. In accomplishment reports to this goal area, animal waste management research and extension efforts have evaluated ways to control odors and other environmental impacts of animal wastes. Efforts have examined ways to genetically reduce the waste production of pigs through more efficient feed utilization. Other studies have evaluated poultry litter in remediation of petroleum hydrocarbons or other animal wastes as potential soil amendments and as feedstuffs for poultry and aquatic species. In a different vein, integrated pest management programs were reported in use by 4,000 growers on over 600,000 acres with a cost savings estimate of $5 million.

One avenue to being globally competitive is the discovery, commercialization and implementation of new production and processing technology. For example, over the past several years, farmers have almost totally adopted greenhouse production of tobacco transplants, saving on labor and producing higher quality transplants. Just in the past two years, baling of tobacco has rapidly been accepted by growers and warehouses. In other areas, a recent patent from the Southeast Dairy Foods Research Center was commercialized and implemented by a large multinational company. The benefits are realized through the availability of dairy products with higher value, reduction of pathogens, and improved nutrient delivery. Work in Food Science developed a rapid shell egg cooling process that reduces pathogens associated with shell eggs and enhances shelf life; potential impact if fully implemented in the industry would be about $15 million. Over the past 10 years artificial insemination in swine has grown from one percent to 80% now, resulting in more rapid genetic progress in swine herds. Improved nutrition, breeding, facilities, equipment and marketing strategies for livestock, poultry and aquatic species have been promoted in our programs; the estimated economic impact is about $15 million.

Finally, significant efforts were devoted to improving the knowledge of consumers about agriculture and in educating decision makers about policy

issues impacting agriculture, families and rural communities. A number of departments have worked to evaluate various agricultural policy changes or proposals related to the tobacco program, new environmental regulations and other issues facing farmers in transition. The International Trade and Policy Center (NCA&TSU), the Natural Resources Leadership Institute, and the Philip Morris Leadership Development Institute are aimed at training leaders to be active in policy making processes that impact their lives, their businesses and their communities. In the livestock and poultry program areas, 17,000 increased their knowledge about the food supply and quality standards; 28,000 citizens better understand the contributions of animal agriculture to society, and over 2,200 farmers adopted practices and standards to address issues and concerns of the general public (waste management, water quality, food safety, etc.).

GOAL 2 - A SAFE, SECURE FOOD AND FIBER SYSTEM

Applied research and extension programs have focused on applying new technologies to maintain the quality and safety of animal-based food products. The program also established a nationally recognized Food Safety Website to serve as an authoritative resource for accurate food safety information.

Processes were developed that Salmonella enteritidis, an egg-associated foodborne pathogen, could be destroyed in intact shell eggs without significant loss of egg quality or functionality. These pasteurized shell eggs are now being test marketed in the US, with the potential for expansion into the European market.

In response to 1991 federal legislation, shell eggs must be maintained at 45 degrees F to prevent growth of an SE organisms. Studies at NCSU, in collaboration with an industry partner, are indicating that cooling times can be reduced from seven to ten days to a matter of minutes. Application of this technique could significantly reduce the chance of growth of Salmonella and extend the shelf life of eggs.

Over 500 trainees have participated in intensive three-day HACCP trainings for the food processing industry (poultry, meat, seafood, dairy, etc.). In addition to the successes in pasteurization and rapid cooling methods for shell eggs, the same team of specialists has been asked to participate in a project to evaluate new packaging materials to protect shell eggs during transportation. The Food Safety Website is designed to be a gateway to all Internet-based food safety information.

GOAL 3 - A HEALTHY, WELL-NOURISHED POPULATION

To achieve a healthier, more well-nourished population, significant impacts have been made in the past year by North Carolina's Land Grant Universities in the areas of extension, research, and teaching. Extension programs were developed or continued throughout the state targeted to consumer needs and under the guidance of the NC Cooperative Extension System (CES) Advisory Leadership System, the NC Cooperative Extension Major Programs (CEMPs), and in collaboration with the NC Nutrition Network.

The following examples are indicative of the broad scope of achievements made in research, teaching and extension in achieving a healthier, more well-nourished population:

Food Product Research included a study to evaluate the effects of dietary

vitamin E levels on refrigerated and frozen turkey breast meat. Results clearly demonstrated that current vitamin E dietary recommendations are not sufficient to produce the highest quality and nutritious turkey meat products.

A study was conducted to improve the macro mineral nutritional balance of fresh-pack dill cucumber pickles. The nutritional balance was improved without loss of flavor quality.

Two studies on peanuts were concerned with enhancing quality and shelf-life of peanuts and peanut products.

Many ham plants encountered excess "hock" spoilage, which adversely affected their profitability. Modifying the curing procedures is estimated to increase profitability by $450,000.

75,048 participants of CES programming increased awareness of the need to have good nutrition habits; 48,490 participants increased knowledge that promotes health; 35,849 participants increased attitudes and aspirations that are indicative of need for good health; and 20,073 adopted diets consistent with dietary guidelines for good health.

Chronic diseases such as heart disease, cancer, stroke and diabetes are the top leading causes of death. As a result of participating in CES programming, participants at risk for chronic diseases changed behavior to reduce risk. Examples include: 12,032 decreased fat intake; 6,736 decreased sodium intake; 8,042 increased fruit and vegetable intake; 2,895 increased calcium intake; 14,081 adopted positive attitudes; 27,031 gained knowledge and 15,176 increased skills to reduce risk for chronic diseases.

4,637 parents increased awareness and knowledge about good eating habits for children; 2,538 parents and 1,753 children adopted food behaviors consistent with the Dietary Guidelines and Food Guide Pyramid.

15,853 participants increased knowledge in nutrition and diet; 3,222 participants became more aware of available programs such as Food Stamps, AC, and free/reduced school meals. Impacts include: 10,217 participants changed practices that lead to appropriate diets; 1,529 adopted behaviors to seek prenatal care; and 1,556 adopted behaviors that reduce low-weight births.

Over 46,363 participants increased their awareness and knowledge of preventative health behaviors; 13,370 participants adopted recommended health care practices; 2,051 individuals adopted practices to remove safety hazards and 1,761 adopted practices to increase home safety. 17,437 individuals adopted preventative measures including installing ventilation systems, radon, and carbon monoxide tests. 2,490 participants increased awareness of agricultural exposure and other health risks.

At the state level, CES collaborated with the Medical Review Board of NC and the School of Medicine at UNC-CH to train health professionals from across the state, as well as to supply 22 counties with $1,000.00 each to conduct chronic diseases prevention activities, specifically in the area of stroke prevention.

The Family Nutrition Program supported by the USDA Food and Nutrition Service was conducted in 40 counties with a focus on food stamp eligible families with three to five year-old children. "You are really making a difference in the lives of many women and children in our community," reported one agency.

GOAL 4 - TO ACHIEVE GREATER HARMONY BETWEEN AGRICULTURE AND THE ENVIRONMENT

Production of livestock, poultry, agronomic and horticultural crops and forestland represents about 30 % of the state's GNP. These enterprises impact the economy, environment and communities in our state. Over the past several years, considerable agricultural expansion has occurred, particularly with livestock and poultry; at the same time, the rural population has been increasing. As a result, conflict has arisen between farm and non-farm populations and sometimes even between even neighboring farmers over issues related to odors, water quality and other environmental aspects of modern agriculture.

Educational programs, often including collaboration with state environmental agencies and private businesses, have been conducted to equip farmers with the tools to farm in an environmentally sound manner. Programs have focused on farmers knowing about and implementing environment-protecting or enhancing best management practices (BMP's). Conservation BMP's were implemented that reduced soil erosion losses by 300,000 tons. Through education and learning to apply waste management and utilization BMP's, livestock and poultry farmers took advantage of an 25,000 tons of nitrogen from animal and other organic byproducts with an estimated value of about $15 million. Through training about proper use of pesticides and other related crop protection BMP's, it is estimated that growers reduced pesticide use by 100,000 pounds relative to non-BMP based systems, with corresponding reductions in production costs. Overall estimated economic value to this program was estimated at $35 million directly due to reduced costs, improved production and higher net profits. Along with these direct economic impacts, the environmental benefits are much more difficult to value, but estimates were about $85 million.

Specific stories of success indicated significant impacts of this program on farms, to businesses, in families and in communities. Dairy farmers in Long Creek watershed implemented BMP's that helped improve water quality, including a 77% reduction in phosphorus loading. Fraser fir growers initiated soil and tissue sampling data to reduce P2O5 applications by over 27,000 pounds and achieved a reduction in costs and reduced loading of the environment with excess phosphorus. Ornamental nursery operators applied scientific insect problems and applied control measures to improve product quality and increase crop value by $10,000. Education and farmer application of genetically modified crops to obtain improved pest management and reduced pesticide use, resulting in increased profits of $1.3 million in one county. Extension programs targeted at youth taught them the value of agriculture and best management practices to help sustain our farms and farming communities. These programs provide learning opportunities for teacher and students alike.

GOAL 5 - To enhance economic opportunities and the quality of life among families and communities.

The programs designed and managed through The North Carolina Cooperative Extension Service to enhance economic opportunities and the quality of life among the families and communities of our state are extremely productive. Three of the four goals have performance levels above 100% for both: 1) targeted audience involvement and 2) targeted audience involvement and adoption of practice. These indicators of excellence point to an extremely well focused effort to continue to accomplish the objectives of GPRA Goal 5.

EFNEP ACCOMPLISHMENT OVERVIEW

During the past decade, EFNEP in North Carolina has focused on reaching young families who qualify for food assistance programs, and in supporting pregnant and parenting adolescents and youth at risk. These efforts involved increased cooperation with local agencies and greater emphasis on program delivery to groups. There was increased interest in the EFNEP On-Site delivery strategy which allows participants to receive EFNEP instruction while at other agencies to receive services.

To lessen the erosion of funding for EFNEP, a requirement is in place to leverage county funds against the federal funding allocation, before re-opening any EFNEP paraprofessional position. This policy was implemented during FY:97. Other organizational changes include the establishment of eleven multi-county units, with area agents supervising paraprofessionals both in EFNEP and the FNP program. Training of the new area agents and their secretaries was an important priority.

The special projects begun with ES/WIC grant funds (FY:93-95), the In-Home Breastfeeding Support Program, and "Hey, What's Cookin'?" continue to flourish. In FY:97, training, management and resource manuals for breastfeeding support were completed and shared with all other states. The manuals were used also for training when new breastfeeding support programs were initiated in additional sites in North Carolina. Interest in the manuals continued to grow and more than 100 additional copies were sold at cost to interested agencies. Continuation funding for the In-Home Breastfeeding Support program came from WIC, the Governor's Smart Start program, local hospitals, and from private philanthropic foundations.

WATER QUALITY

The North Carolina Cooperative Extension System conducted targeted education programs to address the following water quality issues: 1) animal waste; 2) nutrient management; 3) pesticide management; 4) septic systems; 5) drinking water safety; 6) urban stormwater; 7) stream restoration; and 8) watershed management.

More than 9,000 animal waste management system operators have been trained and certified through CES workshops and continuing education programs. A comprehensive nutrient management training and demonstration program is underway for over 5,000 fertilizer applicators in the Neuse River Basin, and will be expanded to other nutrient sensitive waters of the state.

NCCES faculty trained over 8,000 pesticide applicators on safe and efficient practices as part of the state certification process. The Farm*A*Syst and Home*A*Syst are important educational programs in North Carolina. The environmental assessment worksheets from these programs are being used to educate homeowners about proper septic system and drinking water well protection measures. In addition, a new national training center for land-based waste technologies is being used to train septic system operators throughout the state. A new urban stormwater education program was initiated to assist 15 communities in the Neuse River Basin with mandatory stormwater management programs.

Stream restoration education efforts included 3 workshops and 12 demonstration projects to restore and protect more than 4 miles of degraded streams using natural channel design techniques. Effectiveness of

educational programs in the Neuse River Basin have caused interest and program development in Cape Fear and other river basins. More than 5,000 people participated in 4 conferences and 25 educational meetings in the state's 17 river basins to learn how to better manage their watersheds for sustainable environmental protection.

Renewable Resources Extension Act

Renewable Resources Extension Act provides opportunities for NCCES to address needs of private forest landowners, wood products industries, natural resource managers, educators and youth interested in natural resources. In 1997 extension and non-formal educational programs reached nearly 30,000 people in various aspects of natural resources management.

Programs in wood and forest products manufacturing not increased the knowledge of the economic value and importance of over 1,000 individuals, it most significantly caused the adoption of new manufacturing techniques in 269 commercial wood products firms. Of 850 individuals interested in new and value-added products, 422 adopted one or more recommendations in a short period of time.

Forest Stewardship in North Carolina continues to be an important and effective program in reaching landowners and citizens regarding the importance of multiple benefits and facets of forestland management. Of 4,905 individuals receiving education in this area, 1,435 individuals adopted one or more new production or management techniques within 6 months of completing the program. Additionally, over 22,035 individuals completed non-formal educational programs on ecosystem integrity and biodiversity; 9,820 received education in natural resources decision-making. Of 6,244 individuals participating in public policy issues programs, 1,092 of these were currently actively involved in public policy issues. This response and participation indicate a strong clientele interest in making informed decisions and participating in the process relative to environmental issues.

Public officials are a significant audience for natural resources programs. Over three times as many public officials and community leaders (1,866) participated in educational programs than was expected. This indicates a continuing need for addressing environmental and economic issues faced by small communities and local governments.

The devastation of Hurricane Fran provided the opportunity for one county program to partner with other state and federal agencies to develop meetings and opportunities for landowners affected by the hurricane to manage their renewable resources and what financial, technical, tax and educational resources were available to assist them. Over 149 landowners were assisted by this program which is being used as a model in other counties following hurricanes and other natural disasters.

INTEGRATED PEST MANAGEMENT

Educational programs train and encourage farmers to use IPM practices including:

* pesticide applications based on scouting and thresholds
* pesticide applications based on predictive models
* crop rotations designed to reduce pest pressure or destroy pest establishment and survival
* pest resistant varieties
* early planting

* use of early maturing varieties to avoid pest problems

Programs during 1998 focused on cotton, apples and peanuts. Scouting and pest management schools and on farm demonstrations of IPM methods were used to show farmers the benefits of scouting and determining economic thresholds, to show them the pesticide reduction and cost saving advantages of IPM systems, and to demonstrate the ability of beneficials to help control important crop pests.

Forecasting models of insect and disease pressure are increasingly being used by growers to select and apply pest management strategies. On farm demonstrations were conducted using the degree-day model for tufted apple bud moth. These demonstrations showed that the predictive models can accurately time insecticide treatments and reduce insecticide sprays. In 1998, an average of one insecticide treatment was saved with no difference in quality. Insecticide treatments were eliminated on apples were realized by growers using pheromone traps for codling moths and by collecting and mulching leaf litter. Peanut growers were able to implement a predictive risk index for southern corn rootworm. Using this system, on 33% of fields needed soil insecticide treatment compared to 60% in conventional systems, resulting in significant pesticide reductions. The leafspot advisory for peanuts covers all peanut growing counties; one agribusiness owner observed that all his peanut growers use the leafspot advisory, saving them on average $14 to $25 per acre. Statewide, this represents a cost savings of $2.5 million and significantly less fungicide used.

IPM designation for farms is a means used to recognize those farmers who systematically use IPM principles in their operation. This approach to pest management enabled cotton growers to respond in a timely manner to earlier than expected insect problems. Early warning IPM systems alerted consultants and growers. This approach prevented excessive pesticide applications and saved growers in production costs. Although budworms on cotton were at high levels this past season, the IPM emphasis on beneficial insects and allowing the plant to compensate for damage eliminated the need for excessive treatments. Likewise, cotton aphids were widespread and persistent, but only 1% of the crop was treated as growers allowed biological control strategies to work. Grower acceptance of a new budworm threshold indicates they are scouting more, using advisory information, accepting the benefits of biological control approaches, and hastening maturity of the crop to reduce the time it is vulnerable to damage.

PESTICIDE IMPACT ASSESSMENT

The following outcomes occurred from the Pesticide Impact Assessment Program.

1. Development of 22 commodity profiles for submission to EPA documenting estimated pesticide use in production systems, alternative strategies and other information that would identify those carbamates and organophosphates that are critical for agriculture and consumer protection. As of the end of the year, about half of the profiles had been submitted and the remainder are nearing completion.

2. A crop profile database for all profiles developed in the USA was created in conjunction with the Center for Integrated Pest Management. The address is: http://pestdata.ncsu.edu/CropProfiles/

3. Pesticide data reports were submitted for the following crops: strawberries, sweet potato, and peanuts.

4. Information is provided to commodity organizations, research and extension personnel and other people interested in various aspects of pesticide use in crop and livestock systems. Information is provide by direct response, through newsletters, Pesticide Impact Assessment Program websites (http://ipmwww.ncsu.edu/usdanapiap/ and http://ipmwww.ncsu.edu/ncpiap/) and other publications and reports.

SUSTAINABLE AGRICULTURE

Efforts during the year focused on enhancing educators' and farmers' understanding of sustainable agriculture principles and their capacities to share this information with other farmers and people interested in the sustainability of agriculture. Specific outcomes included:

1. Ten farmers with expertise in sustainable agriculture served as trainers for other persons.

2. 65 extension agents received training in sustainability principles, and 35 of them made recommendations of practices that would enhance the sustainability of farms.

3. 65 people completed educational programs on sustainable agriculture, and 50 of them actually implemented practices intended to make their operations more sustainable.

PESTICIDE APPLICATOR TRAINING

North Carolina has in excess of 28,000 private pesticide applicators and 10,800 commercial applicators. In the reporting year, 899 new private applicators were certified, 8,227 private applicators were recertified, and 1,694 new commercial applicators were certified. Commercial applicators were recertified during the year in the following categories: aquatic, public health, forest, right-of-way, regulatory, agricultural animal, ornamental/turf, seed treatment, demonstration and research, agricultural pest, wood treatment, and aerial.

A pesticide spray drift reduction program provided 12 aerial applicators with swath and droplet analysis. Applicators taking the course receive free pattern, drift and droplet analysis, followed by recommended appropriate modification of application equipment or technique to help the applicator reduce or eliminate off-target drift.

Ongoing efforts are underway to revise and update the complete package of training materials to support the PAT program.

FOOD SAFETY AND QUALITY

The goal of this program is to increase consumer awareness, understanding and information regarding food safety and foodborne risks and illnesses. Primary approaches are food handler training, HACCP model development and training for animal products and fruits and vegetables. These programs represent collaborative efforts between the college and Cooperative Extension and other partners, including state, federal and local government agencies, private businesses and non-profit organizations interested in the safety and quality of the food supply and processes to deliver it to consumers.

Twenty-one county teams, comprised of county extension agents and environmental health specialists, were involved in developing and delivering "Serving Safe Food," a 16-hour certification program to local food service managers and food services employees. In 1998, about 420 food workers received this training through extension programs. This training was also conducted by specialists twice for 30 owners, operators or managers of McDonalds restaurants.

Other food handling safety trainings were provided to congregate nutrition site coordinators (108); to two Better Process Control Schools (60); to airborne special forces handling muscle foods in third world countries (91); to school food service workers (80); to "Target Food Safety" participants (41); to state food inspectors (40).

In addition, 18 HACCP workshops provided training for 521 workers in seafood, red meat, poultry and general food products.
Some programs have focused on youth. The Food Safety and Quality Symposium for youth ages 115-17 is aimed to increase their understanding of food related risks and the policy and scientific bases for risk management in food systems. Nineteen youth and one leader participated. Significant knowledge was gained in the course; pretest scores were 25% correct, but posttest scores averaged 85% correct.

The program is also focusing on providing up-to-date, science based information to consumers and other users on food safety issues. The program staff have developed a nationally recognized website (www.ces.ncsu.edu/depts/foodsci/agentinfo/); a train-the-trainer intensive course for 12 extension agents; a four-part food safety update for agents; and a bimonthly newsletter.

FTE ESTIMATES FOR ALL PROGRAMS

Extension FTEs

Year	Professional			Paraprofessional		
	1862	1890	Other	1862	1890	Other
1998	0.0	0.0	0.0	0.0	0.0	0.0
1999	0.0	0.0	0.0	0.0	0.0	0.0
2000	0.0	0.0	0.0	0.0	0.0	0.0
2001	0.0	0.0	0.0	0.0	0.0	0.0

Research SYs Only

Year	Scientist Years					
	1862	1890	Other	1862	1890	Other
1998	0.0	0.0	0.0	0.0	0.0	0.0
1999	0.0	0.0	0.0	0.0	0.0	0.0
2000	0.0	0.0	0.0	0.0	0.0	0.0

2001	0.0	0.0	0.0	0.0	0.0	0.0

Higher Education FTEs

Year	Professional			Paraprofessional		
	1862	1890	Other	1862	1890	Other
1998	0.0	0.0	0.0	0.0	0.0	0.0
1999	0.0	0.0	0.0	0.0	0.0	0.0
2000	0.0	0.0	0.0	0.0	0.0	0.0
2001	0.0	0.0	0.0	0.0	0.0	0.0

CONTACTS

John G. Richardson
Program Delivery & Accountability Leader
Box 7607, 300 Ricks Hall
Dept. of Agricultural & Ext. Education
North Carolina State University
Raleigh, NC 27695
Voice phone: 919-515-2380
Fax phone : 919-515-1965
Electronic mail: john_richardson@ncsu.edu

Eric Young
Assistant Director
N.C. Agricultural Research Service
Box 7643, 100 Patterson
North Carolina State University
Raleigh, NC 27695
Voice phone: 919-515-2717
Fax phone : 919-515-7745
Electronic mail: eric_young@ncsu.edu

NORTH CAROLINA 1998 ANNUAL REPORT:
GOAL 1 - TO ACHIEVE AN AGRICULTURAL PRODUCTION SYSTEM
THAT IS HIGHLY COMPETITIVE IN THE GLOBAL ECONOMY.

GOAL ACCOMPLISHMENT NARRATIVE

North Carolina has a large, diverse and dynamic agricultural sector with a farm gate value of $8.3 billion in 1997, the seventh largest agricultural state in the nation. Sixty or 70 commodities are commercially important, with hogs, broilers and tobacco as the top three when ranked by farm gate vlaue. The problems facing North Carolina agriculture are correspondingly diverse and include new technology, conflicts over natural resource use, and changes in government policies and regulations at the foreign, national, state, and local levels. Priorities are set through a well-developed advisory leadership system that guides extension and applied research program efforts at the county and state levels to meet stakeholder needs.

Increasing the efficiency of animal and crop production and marketing systems is a traditional role of both the 1862 (NCSU) and 1890 (NC A&T SU) institutions in North Carolina. This continuing effort assists producers by developing and encouraging the adoption of practices and enterprises that are profitable and enhance competitiveness in a global economy. In recent years the scope of these efforts has broadened to include research and extension programs to help develop and implement more environmentally sound and socially acceptable farming practices. These activities help minimize the cost of compliance and help farmers remain economically viable in the face of additional costs imposed by new regulations.

Significant progress was made in the most important problem areas and issues described in the plan. Time and space preclude a comprehensive description od all activities and impacts. A brief description of the results of research and extension programs in some of the most significant problem areas follows. Additional information on specific programs can be found in the Success Stories section.

NEW PRODUCTS

The development of new varieties and germplasm with characteristics suited to local conditions is a traditional role of the Land Grant Universities. New crop varieties and germplasm lines released in 1997 include:
- A male-sterile flue-cured tobacco hybrid "NC 72" and a flue-cured cultivar "Oxford 207" that has high resistance to black shank disease.
- Peanut lines "GP-NC WS 7 through 10", with different combinations of resistance to insects, including southern corn rootworm, corn earworm, leafhopper, fall armyworm, and velvet bean caterpillar.
- peanut lines "GP-NC WS 11 through 15", all with resistance to early leaf spot
- Yellow dent corn inbreds "NC310", "NC 332" and "NC334", all with partial resistance to gray leaf spot.
- Yellow flint corn inbred "NC 342" with good grain quality and partial gray leafspot resistance.
- White dent corn inbred "NC 340", a temperate adapted food quality corn of tropical origin with potential to broaden the genetic base of food corn hybrids.
- Yellow dent corn inbred " "NC 338", a temperate adapted line of all-tropical origin with potential to braoden the genetic base of corn hybrids.
- A named winter triticale cultivar with high yielding charateristics.

- Three named rabbit-eye blueberry cultivars.
- Three named root knot nematode resistant cucumber inbreds and three germplasm lines with specific disease resistance.
- Six soft red winter wheat germplasm lines with resistance to blumeria graminis.

The development of new germplasm lines with potentially useful characteritics is one step removed from new commercial varieties.

The Southeast Dairy Foods Research Center, which operates jointly with NCSU and Mississippi State University, received two new patents and filed four new disclosures. One, a phage defence rotation strategy, has been commercialized and implemented by a large multinational company. Center activities focus on the functionality of milk components that affect the quality, flavor and texture of dairy foods, microbial and genetic technologies related to spoilage and safety, and novel biological and thermal processing techniques. These activities create dairy ingredients with higher commercial value, accurate detection methods for the presence of pathogens, and opportunities to improve vitamin delivery.

Extension program efforts in the area of new products or marketing strategies include crops and animals. An estimated 3,000 growers adopted new crops, crop products or marketing strategies which generated $3.9 million in additional income.

INCREASED GLOBAL COMPETITIVENESS

The poultry industry is vertically coordinated and responds quickly to new research-based information. Applied research and extension programs developed at NCSU included new mineral feeding strategies for poultry with a value of $1 million and associated environmental benefits in the form of reduced levels of zinc, copper and manganese in manure. New rapid egg cooling technology was developed with a potential value of $15 million nationwide through improved food safety by reducing the number of pathogens and by increasing shelf life. Faculty in the Department of Poultry Science and the College of Veterinary Medicine also developed a plan for monitoring poultry flocks to achieve early detection of Poult Enteritis Mortality Syndrome and other highly infectious and transmissible diseases.

The swine industry in North Carolina is also increasingly vertically integrated, which creates opportunities for rapid adoption of new research-based knowledge. There are many examples of successful on-farm applied research and extension demonstration efforts. The use of artificial insemination in swine has grown form 1% 10 years ago to 80% now, in large measure as a result of applied research and extension efforts. Work on the effect of alternative sources of fat in swine diets on meat quality has lead to a change in industry feeding practices affecting 8 million hogs in North Carolina alone. Work on mineral supplementation in hog diets has lead to a reduction in feeding levels, with associated cost savings and environmental impacts.

A number of multi disciplinary projects funded through the Animal and Poultry Waste Management Center have implications for the environment and farm profitability and competitiveness. Some of these projects evaluated the efficacy of odor abatement products and made this information available to the industry. Most of the products tested were found to be ineffective and this information has spurred the search for new products and has saved the industry needless expense on products that do not work. Work on swine has shown that the nature of excreta is genetically controlled, including the metabolites present that contribute to odor and the efficiency with

which nutrients are utilized. A commercial scale demonstration has shown that poultry litter enhances the degradation of soil contaminated with petroleum hydrocarbons. Other projects examine opportunities to utilize animal wastes as value added products for soil amendments and feedstuffs for poultry and aquaculture.

Other applied research results include: A solution to an aquaculture feed quality and disease problem that saved fish worth over $770,000; the effective and profitable use of selected by-products in beef cattle rations; an evaluation of the effectiveness of products for the treatment of mycotoxin contaminated feeds for dairy cattle; and an evaluation of dairy bull genetics that has affected the selection criteria used by bull studs.

Tobacco is the single most important crop produced in North Carolina. Research efforts have focused on reduced costs of production and increased export opportunities, with emphasis on the immediate needs of the industry. New sucker control protocols have been developed that have resulted in a 40% reduction in maleic hydrazide residue levels. An increasing number of tobacco transplants are produced in green houses and applied research has evaluated growth media, fertility and clipping frequency alternatives. New varieties of tobacco with lower nicotine and tar and improved flavor and aroma have been developed.

Changes in the peanut price support program legislation created the need to reduce input costs without sacrificing yield or quality. Applied research has produced new recommendations on production practices and runner-type peanuts are being investigated as a means of diversification.

There are more than 2.5 million acres of forages in North Carolina. The environmental benefits of pastoral farming are receiving more emphasis as environmental quality issues increase in importance. Forage systems research includes practical grazing management systems and conservation practices for cattle, goats and sheep. Native grasses have been evaluated for their nutritive value and production potential.

Extension program efforts extend to all major commodities. With some species, programs have focused on problems and opportunities associated with growth and expansion but for others the focus is to restore or sustain profitability. Many of the program elements that provide effective extension education and information transfer involve systems or integrated approaches. Recent examples include integrated pest management (IPM) for row-crop, orchard, organic, and ornamental farms; grazing management schools; multi-disciplinary management education programs for dairy farmers and swine producers; a certified beef producer program that is part of an eight-state effort; and marketing and risk management programs.

Improvements in production practices impact productivity and profitability. For livestock, these include improved nutrition, breeding and marketing practices and improvements in buildings and facilities. The estimated financial impact of these production practice changes is $14.3 million for 1997.

For crop producers, examples of innovative technologies include the introduction of a baling system for marketing tobacco, the adoption of plant varieties developed through bioengineering techniques, and irrigation scheduling programs. Innovations in information dissemination include the development of commodity specific resources accessible through the World Wide Web, including commercial vegetables. Specific impacts include:
- 4,100 growers planted genetically engineered varieties on 127,000 acres, increasing income by an estimated $2.3 million and saving $.7 million in

pesticide costs.
- 4,000 growers adopted IPM practices on 616,000 acres and saved $5 million in reduced pesticide use.
- 2,780 growers implemented other improved practices on 167,000 acres, which resulted in added profits estimated to be over $10 million.

Large confinement livestock operations have come under strict new environmental regulations. In 1997, extension agents were heavily involved in training farmers under a mandated waste operator certification program. Through these efforts, a large percentage of farmers were able to pass required exams and the disruption to farming activities was minimized. Extension personnel were also involved in helping producers develop sound waste management plans that met state regulations. This assistance helped minimize the cost of compliance and helped livestock producers remain economically viable in the face of the additional costs imposed by the regulations.

Concerns of smaller and limited resource farmers were addressed through extension and research programs based at NC A & T State University, including small scale production and marketing programs for producers of vegetables and small ruminants

Not all research projects have immediate application to farm practice and some have implications beyond agriculture into human health. Work by an Animal Scientist on swine genes has created an animal model that can be used as a human research model into blindness caused by retinitis pigmentosa. This opportunity is being pursued through a joint effort at NCSU, Duke University and the Society for the Prevention of Blindness. Work in the Poultry Science Department on glucose absorption in mice has implications for children with Down's Syndrome. There is a collaborative effort with Duke University using poultry as a model for ovarian cancer.

IMPROVED DECISION-MAKING ON PUBLIC POLICY ISSUES

Numerous NCSU faculty members make formal and informal contributions to public policy issues through research, publications, testimony at legislative hearings and committee meetings, and personal contacts with legislators and other decision-makers at the state and federal level. For example, a faculty member in the Department of Agricultural and Resource Economics was actively involved in evaluating the potential impact of the numerous tobacco industry settlement proposals, including testimony before the U.S. House Agriculture Committee. The new International Trade and Policy Center at NC A & T State University made contributions to policy discussions on trade issues.

There are a number of extension programs in the public policy area. NCSU is home to the nationally recognized National Resources Leadership Institute. Graduates of this program have worked with communities to minimize conflict over controversial natural resource issues and help achieve mutually acceptable solutions. Five new area extension agent positions were created, with special funding from the state legislature, to improve the efficiency and effectiveness of agriculture and natural resource policy, specifically in the area of water quality. The efforts of these agents contribute to better informed stakeholders, decision-makers and the general public.

The Phillip Morris Leadership Development Program develops a cadre of knowledgeable young tobacco producers who are capable of participating effectively in public policy debates.

Extension programs in both livestock and crops seek to educate the general public about the importance of commercial agriculture and about environmental and other controversial issues. A better informed public contributes to sounder public policies and choices. An estimated 39,000 citizens became more aware of the benefits of efficient cropping systems, the aims of IPM to reduce pesticide use, the risks and benefits of genetically engineered crops, and global rends and trading practices for crop products. In the livestock area, 17,000 people increased their knowledge about their food supply and food quality standards. 28,000 people gained a better appreciation of the many ways of animal agriculture contributes to their well being. 2,240 farmers adopted practices and standards to address issues and concerns of the general public.

SUCCESS STORIES
1997 North Carolina Cooperative Extension Selected Success Stories.

The following items were selected from a more extensive listing to reflect the diversity of NCCES extension programs and their impacts. Topics are organized under the following headings: Animals, crops, limited resource farming, use of byproducts, and public policy.

ANIMAL PRODUCTION, MANAGEMENT AND MARKETING

Local System: NCSU
NCSU Poultry Science Extension Specialists have led the evaluation of organic sources of trace minerals in comparison with traditional inorganic sources for poultry diets. Organic sources of zinc, copper and manganese are biologically more active and nutritionally more available than inorganic sources. Consequently, poultry feeds containing organic sources of minerals result in lower emission in the feces. Research has also shown that zinc-methionine, a popular organic form of zinc, can improve growth rate, livability, and immune function in poultry. It also enhances macrophage function, the animals first line of defense against pathogens. Several turkey and broiler integrators have used these results to change their nutrition programs to improve general flock health. Over 20% of turkey and broiler producers have adopted the use of zinc-methionine or some other form of zinc in the feed to improve flock health and to reduce carcass downgrading, with estimated savings of over $1 million/yr.

Local System: NCSU
County and area poultry Extension agents and poultry Extension specialists from several NCSU CALS Departments worked with other researchers, integrator personnel and turkey growers to reduce production losses caused by disease exposure. Monitoring and educational programs were developed in order to combat Poult Enteritis and Mortality Syndrome (PEMS) which resulted in growers implementing disease prevention and control measures. Educational efforts focused on "why" biosecurity is important in disease prevention. Monitoring efforts centered on the presence and control of human traffic and pests in and around the poultry facilities. This initiative, along with other changes in production schemes, is credited with reductions in cases of PEMS and other diseases. Four turkey companies were involved and all reported improvements in disease control and bird performance. One company reported medication cost savings of 0.6 cents per pound. With production of over 350 million lbs., that's an annual savings of over $2.1 million.

Local System: NCSU
Based on applied research by NCSU Poultry Science Extension, most NC integrated turkey companies have adopted the practice of feeding higher

levels of vitamin E in turkey poult diets to improve early disease resistance. Preliminary field results indicate that 100 IU of vitamin E/Kg of feed reduces 14-day mortality by approximately 1.5%. This practice has the potential to save the NC turkey industry $1.2 million/yr. Older turkeys fed high dietary levels of vitamin E produced meat with improved water holding capacity and longer shelf life. Therefore, several NC turkey and broiler producers have begun feeding higher levels of vitamin E in their finishing diets to improve meat quality. Although it is difficult to estimate the true economic impact of this change, improved meat quality and shelf-life provides insurance against potential consumer complaints.

Local System: gaston
A farmer requested help with a ration due to a drop in milk and reproductive problems. Based on the history and the appearance of the animals, I suspected mycotoxins. Feed samples were taken and analyzed at the Constable Forage Lab. A high level of one mycotoxin in particular was found: 2487 ppm of DON. The farmer was already feeding a sodium bentonite but cows were still off feed, low on milk and unthrifty looking. I recommended adding buffered propionic acid and activated charcoal to the diet in combination with the bentonite and gave the correct proportions to the farmer. He implemented the recommendations immediately, and within two days was seeing improvement in both feed intake and milk production. Increased milk production of 600 pounds daily occurred with a monetary value of $90 per day, minus $3 per day cost of implementing control measures, for a net gain of $87 per day.

Local System: rowan
Three area dairymen were experiencing problems with herd health and dramatic losses in milk production. All three reported suspicions that their cows were being subjected to low levels of electrical shock thus causing these problems. After Extension on- farm tests were made, stay voltage from the primary source (the power pole) was determined to be the problem. CES contacted the local power companies and networked with them to get this stray voltage properly ground. The result for one of these farms was an immediate increase in milk production of 500 lbs of milk/day, translating into roughly a $2,635/month increase in this farmer's milk check. All 3 dairymen reported significant improvements in overall herd health and decreased cases of intra-mammary infections. As a result, Dairy Herd Improvement Association records reveal increased milk production and decreased somatic cell counts on all 3 farms.

Local System: yadkin
Two dairymen who were experiencing similar problems of lowered milk production, unhealthy cows, and death of three cows. After feed analyses of all feeds and necropsies of the dead animals through the diagnostic lab, we determined they both had feeds which were high in mycotoxins. After working with them on feed rations and making recommendations on practices that could reduce mycotoxin levels in the feeds, they saw an increase in milk production of 4 pounds/cow/day for both herds. This increase in milk production added up to approximately $10,500. Also, the overall health of the cows was much improved.

Local System: yadkin
One farmer and his wife, after attending the DairyWise management education workshops, had to make a very important decision whether to purchase bred heifers to get increased milk production. They went through the decision making methods which were taught in the DairyWise workshops and decided not to purchase additional heifers. Sitting down and going through a detailed decision making process instead of making spur of the moment decision to purchase saved them approximately $45,000.

Local System: rowan
Even the top dairy herds in the state have reproductive management problems. To address these problems in Rowan County, Extension networked with all of the local large-animal veterinarians to have a "Dairy Reproductive Physiology Program". Bovine reproductive tracts were brought in for producers to examine and learn from. Artificial Insemination procedures were reviewed and demonstrated. Forty-eight dairymen and employees attended. As a result, 4 Rowan Dairy Farms that previously relied on bulls for impregnating cows now inseminate artificially. All producers agreed that the immediate impact of not having potentially dangerous animals (bulls) on the farm is negligible compared to the overall increase in genetic pool and eventual milk production of the animals in the long run.

Local System: alamance
With declining cattle prices over the previous three years, stocker cattle producers were having an increasingly difficult time making a profit. A stocker cattle management school was conducted to address issues related to profitability that included nutrition, marketing, business and tax management, grading, and purchasing. 85% of the program participants were experienced stocker operators while 15% were beginners. A pre- and post-test was given to measure the knowledge gained. Post-test scores showed a 25% improvement. Participants were asked to rate the program on a scale of 1 - 10 with 10 being the highest rating of satisfaction. The average rating was 9.2. Participants gained knowledge and skills that will assist them in making a profit. One producer reported the knowledge gained would save him approximately $1000 dollars in feed cost alone.

Local System: wilkes
I coordinated the Wilkes Area Stocker Sale is a cooperative effort involving the CES, N.C. Cattlemen's Association, NCDA and Kilby's Livestock Market. Forty-four cattlemen from Wilkes and six surrounding counties participated. This sale is designed to commingle feeder cattle and group them in large uniform lots in an attempt to command a price premium over other marketing channels such as weekly auctions. This sale returned consignors $25,000 over weekly auction prices. Other lessons this sale demonstrated to cattlemen are genetic selection regarding frame size, muscling, breed and breed combinations as well as nutrition and management practices that the CES addresses in its educational programs.

Local System: sampson
Cattle bring more when sold in truck-load lots. For the last 3 years, the Sampson County Cooperative Extension Service has conducted and promoted such a marketing program. This year 22 loads were sold. These loads averaged approximately 65 head per load with an average weight of 750 pounds per head. When comparing truck-load prices with graded sale prices held during the same time period, truck loads yielded a $3 to $5.75 per 100 weight advantage for the same weight and type of cattle sold at a graded sale. A conservative advantage of $4 per 100 weight is very reasonable. Based on these facts, the 22 loads of cattle brought over $49,000 more than they would have if sold through a graded sale.

Local System: onslow
As a result of participating in the NC Certified Beef Production Program, one small beef producer adopted the practices of vaccinating his entire herd and weaning and bunk-breaking calves prior to sale. He also decided to continue castrating and implanting male calves and de-worming the entire herd. These management practices resulted in increased value of calves sold due to increased weaning weights. Because of his increased knowledge of marketing options, he sold these calves at a graded feeder calf sale rather

than at a weekly auction. This marketing decision resulted in an increased price of $24 per calf compared to sale at a weekly auction. Total monetary value to just one small producer as a result of NCCBP participation was $1,449.

Local System: rowan
Beef cattle production revolves around the ability to use forage in the most efficient manner year round. Working with a local producer, a grazing study was done regarding summer annual forages. The project resulted in savings of $1,250 for the producer. Through the use of creep grazing the producer realized an increased weaning weight on calves worth $450. In addition, information was gained as to forages best suited for Rowan county production under grazing situations.

Local System: catawba
Beef producers can often improve the profitability of their operations by evaluating the cost per pound of feed nutrients and taking advantage of the best feed buy. Six local producers received assistance from Extension in evaluating feeding programs for weaned calves. These producers fed 37 tons of a locally available byproduct (wheat midds) to weaned calves at a saving of $60 per ton ($2,220 total savings) over the cost of a conventional feeding program. These 6 producers saved approximately $3,700 and are now sharing this information with other farmers, who are also evaluating their feeding programs.

Local System: haywood
Beef Producers from Haywood and Western North Carolina traditionally receive less for their feeder calves due to sickness and a higher death loss resulting from selling calves just weaned from their dams. A feeder calf pre-conditioning program including weaning, vaccinating, and feeding for 30 days, was initiated to increase the value of calves marketed. In 1997 seventeen Haywood beef producers participated in two pre-conditioned sales. These sales are sponsored by the Extension Service, the local livestock market, and supported by feed and animal health suppliers. The calves gained an average of 60 additional pounds during the pre-conditioning period and sold at a 5-cent advantage over traditional marketing programs. The additional price bonus and increased gain brought those seventeen farmers approximately $38,180 additional income at a cost of $10,120 for a net return of $28,060 for their effort.

Local System: person
On March 27, 1997 the NCCES-Person County Center conducted an educational meeting with 55 beef cattle producers in attendance. These individuals learned about warm-season grasses and the benefits of them. Eighteen producers planted approximately 2000 acres of warm-season grasses, which allows them to have 45 percent more feed available for their cattle. One producer stated, "This is the best method to renovate old pastures and I have increased my calf weaning weights on one farm by 50 lbs./calf." This producer is also educating surrounding producers to adopt this practice.

Local System: mcdowell

Producers who seeded new varieties of low endophyte fescue 3-4 years back had a problem with thin stands. Reseeding by broadcasting would require 20-30 lbs. of seed per acre. Producers did not have access to a no-till drill that would only require 10-15 lbs per acre. Most producers have farms too small to warrant hiring a custom applicator to interseed. Extension coordinated the pooling of acreage and assisted with arrangements for a custom driller to no-till plant approximately 450 acres of forages for 25

producers at a cost of $16-$20 per acre. Savings in seed cost (@$1.38/lb) equaled $20.70 per acre or a total of $9315. An extension presentation to Farm Bureau resulted in their subsidizing producer-members $10.00/acre on seeding cost, resulting in an additional saving of $4200. A projected increase of 1 ton of hay per improved acre (@$100/ton) means an increase of $45,000/year (450x$100).

Local System: onslow
The 1997 Southeastern NC Hay Directory, a collaborative effort of Agricultural Extension Agents, includes a listing of 32 forage producers in 11 counties with 14,688 tons of hay for sale. 300 copies of this directory were distributed and the Internet version of the publication was accessed 390 times. One producer was contacted by a potential buyer from New York who had seen the directory on the Internet. Another producer reported selling 45 tons of hay within 2 weeks as a result of being listed in the directory. Several producers have adopted the practice of sampling hay for chemical analysis as a result of information in the directory. It has also served as a marketing tool for the Cooperative Extension Service by introducing new audiences to the organization.

Local System: onslow
A livestock/forage producer consulted the Cooperative Extension Service when considering beginning a business enterprise to custom harvest forage as haylage. This method had not been previously practiced in the area. The agent, utilizing Extension Specialists in the Animal Science and Crop Science departments at NCSU, provided current information to help the client in decision-making. He obtained a contract with a large swine integrator to custom bale haylage on all of the company owned farms, and harvested 7,850 bales of haylage in 1997. The client reported the net revenue from haylage production was $1,465 per day as compared to $403 per day for traditional haymaking. The client also reported that information obtained through NCCES had contributed to the success of this enterprise. NCSU, NCCES and the grower are currently involved in a research project that will address practical questions related to haylage production in Southeastern NC.

Local System: lenoir
Goat production is on the rise, both locally and nationally. However, reliable information about goats has traditionally been hard to obtain. Research based information is very scarce compared to other livestock species, and has required extensive searching to find. In response to this unmet need, the Lenoir County Goat Information Links Page was developed for the World Wide Web. With well over 200 links to educational pages, this page provides a centralized location to access production information for all types of goats. Response to this page has been tremendous. In a seven-month period, 5521 hits have been recorded and several e-mail messages received. One web-user writes, "I have been surfing the net for over a year; and much of that time researching goats. This is one of the very best Ag. Web Pages that I have visited. Nice Job! I'm sure, I'll be visiting often."

Local System: chatham
On March 21, 1998 a Sheep and Goat Workshop was held at the Celebrity Dairy in Siler City with 100 producers in attendance. This five-hour workshop consisted of programs concerning nutrition, vaccination and de-worming and forage management. A live animal demonstration was also held. Post evaluation surveys given to those attending indicated the 99% found the workshop to be useful or very useful. Following the workshop, surveys of local agribusiness that sell sheep and goat supplies showed a 120% increase in sales over the same period one year earlier. The agribusiness managers are giving credit for this increase in sales to the Sheep and Goat Workshop.

Local System: pitt
Fingerling hybrid striped bass are reared at three hatcheries in this area. When first hatched, the larval fish are counted prior to sale or when placed in nursery ponds for growth. To date, counting the 3mm long fish has been both difficult and inaccurate. This spring, one hatchery has followed the advice of the extension office and rented an electronic larval counter. This device has been measured to be 98% accurate as opposed to the +/- 35% accuracy using traditional methods. Savings due to accurately measuring larvae will exceed at least $25,000.

Local System: haywood
A Commercial Trout Production Web Site was developed early in 1997. In summary, the web site received 6,684 hits from 1/2/97 - 12/17/97. I received E-mail and phone calls from numerous states and the countries of South Africa, Australia, Mexico, Norway, Chile, and others. Several extension specialists from this and other states have provided compliments and have used the information in the web site. The site is currently receiving 30-40 hits per day and averaged 19.7 hits per day for the year. This has been/is an excellent vehicle to market NCCES and the Commercial Trout Production Program.

CROP PRODUCTION, MANAGEMENT AND MARKETING

Local System: lee
The Cooperative Extension Service participated in the flue-cured tobacco baling project to explore a new marketing method. This project covered the five major tobacco producing states and involved over 200 farmers. In our area, 20 local farmers chose to bale some of their crop. We baled over 1 million pounds of tobacco, which was sold for an average of 10 cents a pound higher than non-baled tobacco generating $100,000 in increased income.

Local System: pitt
How does a tobacco farmer learn to produce tobacco transplants in a new greenhouse?.....by following Extension recommendations. Beginning in December 1996, five Pitt County tobacco producers have been counseled in order to provide the latest research concerning tobacco greenhouse production. Eleven basic practices were recommended and monitored using on-site visits with each of these producers. As a result of this process, sixty-six percent of these practices were incorporated into their operations. These adoptions represent a potential saving of $85,384 to these county producers. Among the recommended practices to these producers were water sampling, proper equipment purchases, and using the recommended seeding date.

Local System: wayne
Wayne County has 6500 acres of tobacco that are being treated with pesticides too soon. By working with three fertilizer dealers we were able to hold three tobacco scouting clinics which 28 producers attended in 3 different communities. They learned about economic thresholds of tobacco insects and how not spraying to quickly can help protect beneficial insects and cut down the number of times that they do need to spray. Cutting out one spraying would reduce the quantity of chemicals they use by 6500 pounds, thus increasing their profit margins and protecting the environment for future generations.

Local System: ashe
Income from Burley Tobacco in Ashe County was $3 million for 1996. This important commodity is threatened by a destructive disease known as metaxyl resistant blue mold. Losses attributable to this disease were $900,000 this

past growing season. A pressing need exists for growers to understand the nature of this disease so necessary control strategies can be implemented. An educational program has helped growers learn how the fungus moves from sources of infected tobacco to susceptible growing areas, how a community approach is essential and how to utilize weather data and early detection to implement preventive controls. Consequently, over 800 growers are more knowledgeable about a Blue Mold Control Plan that utilizes cultural practices, chemical preventive sprays, and early warning forecasting to reduce disease incidence. Growers recognize the need for current information and are using the NCSU Blue Mold website and a toll free hot line to determine spray sequences.

Local System: edgecomb
Tobacco greenhouse operators continue to recognize the importance of sampling their water to determine nutrient status. Sixty-two percent of greenhouse operators sampled their water in 1997 and those growers who detected boron and/or bicarbonate problems saved $60,750 by not having to purchase replacement plants. Both problems can be corrected with little trouble, however undiagnosed problems can result in fewer and less healthy transplants.

Local System: bertie
The Extension response for tobacco blown over by Hurricane Danny included the collaborative efforts of Bertie County officials, North Carolina Department of Agriculture, NC Department of Correction and the many growers affected. Prompted by growers' requests, calls were made and resulted in 8 prison inmate labor crews from Green and Pasquotank Counties. Approximately two thousand acres were affected among twenty-two growers. Labor savings to local growers amounted to more than $13,000. Additional savings were realized from tobacco that would not have been harvested.

Local System: caswell
Caswell County Producers have had an increasing problem with Black Shank. In 1996 I put out a test plot with a procedure using Black Shank resistant variety. I had a tour with 30 producers coming to observe. From this test we had 15 producers that switched varieties to a Black Shank resistant one. The number of acres affected was 425. These producers were averaging a 10 percent incidence in disease - in 1997 they had none. They had a 10 percent increase in yield and income in 1997. This amounted to a $255 increase per acre in income.

Local System: duplin
The Duplin County Extension Center cooperated with the Magnolia Partners in Agriculture Project to improve agricultural sustainability in Magnolia. During 1997, the Duplin County Extension Center conducted a tobacco scouting project in the Magnolia. $7,600 in grant funds were obtained to finance the project. 500 acres of tobacco were monitored on a weekly schedule for 15 weeks. Growers were notified weekly of pest levels in their tobacco fields and were educated on when to make remedial pesticide applications based on economic thresholds. All participating growers were able to avoid insecticide applications for budworms early in the season. This saved an average of $15.50 per acre on 500 acres of tobacco. The value of the service plus the insecticide savings alone have a value of $15,350. Growers indicated additional benefits of the project from such as disease maps, weed maps, and increased yields from timely management.

Local System: vance
Two farmers grew tobacco organically for a niche market for the first time in 1997. A severe aphid population developed on their crop and the organic pesticide options were very limited. Cooperative Extension designed a

replicated test to evaluate the existing organically approved pesticides for aphid control. Extension applied the pesticides in the test and within 24 hours the growers knew the pesticides were ineffective. Cooperative Extension advised the growers to top the tobacco earlier than normal to remove the succulent growth where the aphids were concentrated. After topping, aphid numbers rapidly dropped to negligible levels. The growers avoided unnecessary pesticide applications, saving $1450. Their average yield was 2600 pounds per acre which is a better than average for tobacco.

Local System: haywood
Many tobacco barns are in a state of disrepair or not in the control of tobacco producers, creating a lack of available curing space for the Haywood County burley crop. Temporary post-row curing structures have been promoted as an economical alternative for those farmers wanting to increase production or those with limited curing space available. Farm Bureau and the Extension Service certified 15 Haywood producers who applied for a $500 grant from the Philip Morris Tobacco Company to build temporary curing structures during 1997, bringing $7,500 in grant money to Haywood. 45 other producers have built temporary structures in 1997 or recent years taking the temporary curing capacity to approximately 150 acres. Utilizing these structures saves about 50 percent in labor costs during hanging and let down for classing, for an additional cost saving of $28,800 for 1997.

Local System: wayne
Using newsletters, radio spots, newspaper articles, field visits, phone calls, and dealer contacts, Extension informed Wayne County cotton producers of scouting results and insect pheromone count data collected by three volunteers throughout the summer. As a result, local cotton producers sprayed for bollworms one time less than expected, saving approximately $144,000, and applied 900 fewer pounds of insecticide.

Local System: martin
Crop year 1997 saw an unusually cool spring. Cotton was 2-3 weeks behind normal development. In situations like this, Pix growth regulator can speed up fruiting and increase yields. Workshops were held at several locations in the county. 47 producers attended who accounted for probably 10,000 acres of cotton. One farmer who attended a workshop and used this practice averaged over 900 pounds of cotton. He also picks other farmers cotton and attested to the fact that some nearby farmers whom he knew did not use Pix in this timely fashion averaged around 600 pounds of cotton per acre. This yield difference is worth at least $180 per acre.

Local System: northampton
In July of 1997, local extension agents and university specialists gathered with 24 local producers in Mike Belch's farm workshop to discuss the current fluctuation in the cotton market and strategies for ensuring a good price when the cotton was harvested months later. Producers learned about hedging, basis, futures, and options. As cotton prices fell to 67 cents in the fall, Greg Taylor wore a quiet smile. Following the July meeting, Greg had booked nearly half his crop at 77 cents. On approximately 100 bales of cotton, a 10-cent difference in price represented a savings of $10,000!

Local System: northampton
An unusually cool and dry spring resulted in stunted cotton growth in Northampton County, limiting the plants' ability to grow out of the damage caused by thrips, aphids, and spider mites. In addition to advising numerous cotton producers on how to deal with these conditions, David Fogarty established a test plot to evaluate the effectiveness of 5 treatments on the unusually severe aphid attack. The test results provided producers with the information needed to best combat the infestation. 800 acres treated on the

basis of these results saved producers an estimated $6400.

Local System: bertie
Problems with wind and sand injury on cotton in the spring has resulted in educational programs on reduced tillage farming methods. Acres under reduced tillage have increased from 500 to 20,000 in 1997. Most farmers are strip tilling, using hooded sprayers and never cultivating the cotton. Educational programs and farm visits have assisted farmers in equipment selection adjustments, along with herbicide selection and rates. Results have been the use of less herbicides, reduced tillage trips, savings on land preparation time in the spring, reduced cultivations, better weed control, increase in organic matter and better stands with no wind damage. All these have resulted in a $487,500 savings to Bertie County farmers.

Local System: chowan
Peanut Pod Blasting to determine maturity for optimum harvest date is a valuable educational program for peanut farmers. Six opportunities were made available to use equipment to run tests and 32 growers from 4 counties ran 86 samples representing 1100 acres of peanuts. Surveys have shown that information provided has affected digging date by at least one day. This years adverse weather has increased that to up to 10 days. Using an average of 3 days for improvement in harvest and the fact that peanut yields can decrease 100 pounds for each day away from optimum harvest date, this program increased peanut income $115,500.

Local System: bertie
An irrigation scheduling program, EXNUT, is being developed for Virginia type peanuts in Bertie County through cooperation with the National Peanut Research Lab in Dawson, Georgia. The program was run on 25 fields and irrigation recommendations made three times weekly over a period of forty-five days after planting to two weeks before digging. Average yield per acre on the 25 fields was 4,251 pounds per acre. The expected county average yield in 1997 will be 2600 pounds per acre for a difference of 1651 pounds. Farmers contribute the scheduling program for at least a 400-pound increase per acre. Impact of the scheduling program on 1431.2 acres irrigated is $183,193.

Local System: bertie
Early detection of Sclerotinia Blight is very critical because the disease spreads rapidly if not controlled. Farmers were informed when conditions were conducive for disease development through newsletter and answer machine. Early detection and control measures saved farmers $375,000.

Local System: bertie
Determining peanut maturity and the correct time to dig is a very vital production decision. Research has shown the amount of Heat Units required for specific varieties to have mature peanuts. An Envirocaster was operated during the year to monitor Heat Units. Accumulation of Heat Units was very low in 1997 because of a cold spring and cooler than normal growing season. To help farmers determine the maturity of the crop and recommend digging dates, workshops were set-up at three agribusiness locations. Approximately 200 field samples were pod blasted to determine maturity using the Hull Scrape Method. Most peanuts needed two more additional weeks than normal for optimum maturity. Increased profits by delayed digging as a result of the workshops amounted to $45,000.

Local System: bertie
Extensive research continues in the county for control of CBR disease on peanuts. A new variety of peanuts, NC-12C, has been tested and released to farmers. The variety has moderate control of CBR that yields 300 lbs. per

acre and grades two cents per pound more than the traditional CBR variety, NC-10C. In 1997, acres of NC-12C increased by 5,000 acres. Impact of this new variety is $30,000 to Bertie County producers.

Local System: halifax
Peanut farmers are searching for ways to save production costs. One of the biggest savings for some of our farmers who have begun growing runner varieties of peanuts is in seed costs and gypsum (calcium) cost. Research shows that additional gypsum is not needed for runner peanuts. By showing growers how to determine calcium levels in the soil by utilizing a soil test formula approximately 2000 acres of runner peanuts were not given additional calcium. This represents a saving of about $30 per acre or $60,000 for these growers. Growers were also shown that the seeding rate could be cut by 20 lb. per acre because seed size is smaller, saving an additional $16/acre or $32,000.

Local System: johnston
Farmers, agribusiness, and the Feed Grains Advisory Committee indicated that a New Technology Workshop was needed in order to understand benefits and opportunities of planting genetically engineered crops. A Biotechnology workshop was held which specifically dealt with how to boost efficiency and increase profits by using new technology, determining the value of new technology, safety of biotechnology, and moving biotechnology from the laboratory to the marketplace. As a result, 700 producers used genetically engineered cotton and soybeans as part of their IPM program to reduce pesticide use, protect the environment, and as a strategy to reduce hard to control weeds and insects on over 40 percent of Johnston County's acreage. The high yielding, genetically engineered varieties reduced production costs 10 percent and increased profitability $1.3 million. One agribusiness has begun implementing a precision farming program and hired an additional full time employee.

Local System: bertie
The acceptance of Round-up Ready Soybeans by producers has had a great impact on the number of herbicide applications to soybeans. Applied over the top Round-up has allowed the reclamation of land that had been abandoned due to sicklepod and other hard to control weeds. The elimination of just one herbicide application per acre saves growers $41. Bertie County has approximately 12,129 acres of soybeans with about 33% affected by this weed. There is the potential to gross $164,000 from this practice.

Local System: bladen
In response to several growers' requests, I showed farmers how to evaluate the worm pressure in a number of soybean fields. This in field training of the growers in IPM saved an estimated 2000 bushels of soybeans. At seven dollars per bushel, this means $14,000 additional income in 1997. This does not take into account the additional income in years to come that the growers will make due to the skill and confidence they gained from the in field training.

Local System: iredell
On-farm demonstrations were conducted in Iredell County in 1997 with wheat, corn and soybeans through a cooperative effort involving local producers, seed company representatives and grower associations. Variety selection was the main criterion for the demonstrations although recommended cultural practices were also emphasized. An on farm tour was conducted as well as the data was presented in grower meetings. Based on sales information from seed company representatives the information gained from these local demonstrations has been very influential in the adoption of some of the leading varieties. These test increased income by $2.3 million when the

yield differences were estimated using a 10 percent adoption rate, which is very realistic.

Local System: wilkes
The Wilkes Corn Hybrid on farm test was used to evaluate 17 hybrids from 7 seed companies for grain, silage and silage feed value. This information is used by area corn growers to assist them in making hybrid selection decisions for the coming year. Surveys of farmers and farm supply stores show 85% of country growers utilize this information in making management decisions which greatly impact profitability.

Local System: rowan
Commercial vegetable production requires highly developed management skills to be competitive in the market place, with quick access to pertinent information such as tissue and soil analysis and information on cultural practices. 95% of commercial producers have computers, but none knew how to access the World Wide Web for information. In many cases, information delivered by mail is too slow. Networking with the NCDA Agronomic Division and a local internet access company, the Extension Service coordinated a workshop explaining the efficiency and usefulness of the Web for commercial vegetable producers. As a result of the workshop, five growers out of twelve producers regularly access the Web. Interest has spread and six producers requested a repeat the workshop in the fall of 97.

Local System: henderson
The greenhouse industry in the county is growing steadily and occasionally one runs into a new grower. In one such case a young Asian-American man with 30,000 poinsettias was visited. This crop was the first he had ever grown of anything. The plants were chlorotic showing a distinct nutritional deficiency rendering them un-saleable. With less than a month to market time, a mailed-in tissue analysis was too slow to help him. It was suggested that the deficiency could be Magnesium because he had not applied this micronutrient. After he applied Epsom Salts (Magnesium Sulfate) at the recommended rate for two weeks the plants had regained their color and were marketable! This was a difference of being able to sell 30,000 plants at $2.30 each ($69,000) or dumping the entire crop. His face was all smiles at our next visit!

Local System: columbus
Don Gilbert of Carolina Hydroponic,Inc. has successfully linked up his $100,000 operation to a major chain store buyer in N.C. and is presently supplying quality tomatoes to several high volume stores in the Wilmington area. Mr. Gilbert credits Milton Parker, Area Ext. Agent with greatly assisting him with the market contact. "My market is now firmly in place to supply 5 Wilmington stores with fresh winter Greenhouse tomatoes" states Mr. Gilbert. "I was able thanks to Mr. Parker to receive $1.50 per lb." adds Gilbert.

Local System: bertie
Thirty-one greenhouses in Bertie County require water sampling and media compatibility determination. Greenhouse transplant producers benefit from water sampling so that nutrient levels are maintained throughout the growth period. Adjustments to transplant solution saved those growers the expense of purchasing plants for their total acres and six other buyers. Sampling revealed the need for micronutrients that were added and saved this expense to 9 producers, estimated to be worth $97,200.

Local System: caldwell
Ornamental nursery growers in the foothills are growing 35 new species of conifers. Some growers planting these new conifer species have had little

exposure to the vast array of potential pest problems. An IPM grant in the amount of $7,275 was obtained by the NCCES agent for the purpose of developing an IPM program and manual for conifer species. 250 nurserymen and their employees were provided with a manual and trained on implementing an IPM program designed for identifying and controlling disease, insect and mite pests with minimal chemical inputs. 44 growers adopting this program saved $660,000 in chemical costs and reduced the input of chemical active ingredients into the environment by 2,640 pounds. Through this program, growers have an increased awareness in the judicious use of pesticides and an alternative pest management approach for the ornamental nursery crops industry.

Local System: henderson
Apple growers and other farmers are extremely dependant on weather for growing their crops. Many growers requested information concerning up-to-date local weather information. Because of this need, Extension contacted Paul Speranza, a local private weather forecaster, about giving local daily agriculture weather forecasts. Sponsors pay Paul $160 per month. We contracted with 8 companies to sponsor Paul's services starting in April through November '97. His information includes 3-day forecasts for precipitation, wind, soil temperature, cooling degree days, high and low temperature and any chance of frost, freeze, hail or other extreme weather conditions. On average we receive 260 calls per week requesting timely information. This pilot program has been very beneficial to our growers in helping them to plan their work around weather conditions.

Local System: henderson
In 1997, 18 volunteers were trained during a 40-hour course as Master Pomologists. The program extended the resources of the Extension Service tremendously. Master Pomologists are used as technicians to maintain the Henderson County Apple Variety Block. They help in tree pruning, tree training, collecting bloom dates, harvesting fruit, collect post-harvest data related to fruit quality and storability. Students from time to time conducted apple training sessions for county residents. Approximately 650 volunteer hours had been given back to the North Carolina Cooperative Extension Service - Henderson County Center as of June 18, 1997.

Local System: wilkes
Ten apple growers participated in an apple pest alert system that involved an automated calling system when pest infestations were found. These growers were alerted to two fire blight infections, three scab infections and three codling moth infestations. As a result these growers were able to pinpoint pesticide spray applications to more efficiently use pesticide sprays.

Local System: alleghan
As a result of the Christmas Tree IPM Program in Alleghany & Ashe Counties, a Crop Scouting Service has been established and is beginning its second season. The service is scouting 270 fields, about 500 acres. This season, the service detected a new pest to Fraser Fir in Ashe and Alleghany and the early detection gave Extension the opportunity to alert and educate growers, thus reducing the economic loss.

Local System: surry
In spring of 1997 3 acres of contract medicinal herbs were planted in Surry County. Contract prices of up to $2,600 per acre per year for up to 4 years will be received by these producers. The herbs grown were Valarian, Echinacea, and Goldenseal. These herbs will be harvested for their root crop up to 4 years from now. Additionally a greenhouse operator was contracted to grow dandelions as transplants. These were shipped to other planting sites in the state. Production of medicinal herbs offers tremendous alternative

opportunities for Surry County, where tobacco acreage predominates as a field grown crop.

Local System: lee
There has been increased interest in the production of fruits and vegetables and selling them in the retail market. This interest is from tobacco farmers and others who have small acreage and want to make it profitable. 96 farmers attended two area vegetable production meetings and learned about marketing opportunities, disease control, trickle irrigation, cantaloupe, watermelon, and specialty crop production. An alternative agriculture demonstration was planted and included an onion trial, a lettuce trial, and a specialty crops demonstration including lettuce, chinese cabbage, broccoli, cauliflower, onions, cabbage and honeydews. Prior to harvest, 44 farmers attended a tour to learn more about growing these specialty crops, record keeping, selling on the internet, running a pick-your-own operation, growing strawberries, and greenhouse production. As a result of these efforts, 70 farmers have expanded their operations to include fruits and vegetables. This increase in production is worth over $1 million.

Local System: lee
There are 20 area strawberry growers. Frost, spider mites and diseases cause the biggest reduction in yield once plants have been successfully transplanted. Fifteen of these growers followed Extension's recommendations in terms of when to frost/freeze protect their crop and when to apply the needed fungicides and miticides. They increased their yield by an average of 10,000 pounds, generating over $150,000 dollars in income.

Local System: columbus
Strawberry producer who grows on black plastic with drip irrigation & fertilization program had excellent crop. Wondered if he could follow with another crop. The NCCES Ag. Technician and the cooperator checked on different crops and decided pumpkins might be best. After killing off berries, cooperator seeded pumpkins the first of June with plant tissue analysis and followed recommended exact fertilization. By Halloween he had a field full of the finest pumpkins you ever saw. By double cropping, the farmer made $7,000 more dollars on the same black plastic from the berries with very little expense.

Local System: chatham
With assistance of the Chatham County Extension Center, 28 local farmers have developed a new farmers' market in the town of Pittsboro. Apparently, the timing was right, as there was a good turnout of growers, as well as customers. Many growers are reporting sales at the Pittsboro market that exceed there sales at other established markets in the area. The market is enjoying strong support from the community, as indicated by letters and favorable comments from both the town and county managers and participation in the market by one of the county commissioners. Estimated gross sales for the market in the first twelve weeks is approximately $40,000.

Local System: lenoir
NC State University Research has shown that there are substantial marketable yield advantages to using micropropagated, virus indexed, superior clones as the source of your Foundation Seed. After an intensive extension educational program, encompassing the development of an ongoing grower seed demonstration, growers seem convinced that this is the way to go. There are approximately 2250 acres of sweetpotatoes in the five county area. Sixty-five percent of are the Beauregard variety and of these 48% are of superior clone, micropropagated origin. This has resulted in substantially more 49000 bushels more marketable potatoes or about $400,000 more income. The results are reaching state-wide.

Local System: NCSU
There is a great need to increase the competitiveness and profitability of North Carolina's forest products industry. Extension programs focused on educational and technical assistance to North Carolina forest products manufacturers resulted in one sawmill operation making modifications to their dispatch system. The results reported by this one mill indicated a production gain of 10,000 board feet of lumber per day or increased income of $300,000 per year. While the entire wood products industry is served by Wood Products Extension, this one example is indicative of the many impacts accruing as a result of useful educational opportunities being provided in a timely and inclusive manner.

Local System: NCSU
The lack of adequate markets for North Carolina's forest products, especially low quality hardwoods, is the primary barrier to good, long term management of the state's forests. Extension programs focused on educational and technical assistance to North Carolina forest products manufacturers resulted in the location of a hardwood chip facility and export terminal in Eastern North Carolina during 1989. In 1997, this company was contacted to determine its economic impact. To date, approximately 4.2 million tons of wood fiber have been exported to the international market with an estimated F.O.B. value of $400,000,000. Until this market was developed, the product was essentially a "throw-away" by-product for the North Carolina logging industry. This $15,000,000 investment has also led to the creation of an estimated 400 new jobs.

Local System: fletcher
We conducted a "Greenwise" management education program in Blowing Rock. This is a 3-day intensive management program for Nursery producers. One of the largest christmas tree producers was in attendance. After the meeting he made several comments about how useful the training had been. One is that he had no direction in his life until this training. The personal mission statement session had changed his total perspective. He was now placing emphasis on relationships instead of tasks and was putting his first things first in his live. He measured some efficiency factors before the meeting. His efficiency is now increased 35%. He says he is being more effective instead of efficient.

Local System: jones
Special rules in preparing a farm tax return create a challenge to tax preparers who are unfamiliar with farm tax regulations. Two Farm Tax Workshops were held, with help from NCSU Economic Specialists, primarily for tax preparers who have farm clients. Of the 61 people who attended, 47 were farm tax preparers. The number of farm tax returns they and/or their firms normally did each year is conservatively numbered at 4300. Participants expressed appreciation for the workshop in helping them avoid farm tax pitfalls, and indicated interest in extending the workshop to a full day.
Local System: warren
A total of 72 local farmers and agribusiness people participated in four pesticide re-certification programs offered locally by Cooperative Extension. As a result of their participation local farmers and agribusiness people report a reduction of an average of one application of pesticides, resulting in a savings of approximately $190,000 countywide. The county landfill has also reported a saving of about $14,400 as a result of fewer pesticide containers being recycled.

Local System: johnston
How much fertilizer is needed and how much money can be saved by taking soil samples? Increasing concerns about water quality, new regulations, and

increasing profitability prompted 20 percent more farmers to take soil samples and nematode assays this year. The number of samples was extremely low last year, so an intensive one-month Soil Sampling Promotion was conducted in cooperation with 43 local fertilizer dealers, 80 Agribusiness members, and NCDA. The result was 1877 soil samples and 225 nematode assays were taken during the promotion. Local dealers estimate that growers saved over $500,000 in fertilizer cost and yield reductions by selecting varieties suited to reduce damaging nematodes a result of taking soil samples.

BY-PRODUCT USE

Local System: caldwell
The Caldwell Extension Center has worked closely with the city of Lenoir in utilizing the municipal sludge as a lime source for farmers. The material if used properly will supply farmers with a lime equivalent material free of charge. Through educational programs and a on-farm test, 25 farmers have applied this material to 500 acres of land saving them $20/acre in liming cost. The total saving for the farmers is approximately $10,000.

Local System: harnett
One textile mill in Harnett County generates 2,600 bales of cotton waste annually. The waste was going directly to the landfill, taking valuable space and costing $30/ton for disposal. From research at NCSU the company learned that the waste could be used as cattle feed. The material has about the same nutrient content as hay grown in the area and the mill gives the bales to local producers. This program saves valuable landfill space, saves the farmers $39,000 in hay costs, saves the mill $19,500 in landfill charges, and provides an environmentally sound disposal method. This self-sufficient program with a total economic impact of $58,000 is a perfect example of how research based information provided by the NCCES makes a difference in peoples' lives.

Local System: craven
After the storms of 1996, many farmers were financially strapped for the 1997 crop year. At the request of two of our farmers, I gave them special attention for the 1997 crop year beginning with soil sampling in fall of 1996, variety selection, nutrient management plans, weeds, insect, and disease control. For liming requirements we used wood ash, saving them $16,000. During the growing season I made regular visits to the farms to advise the producers as to what type of management to use. As a result, even with a dry season both producers indicated they increased their net production returns by 25%.

LIMITED RESOURCE FARMERS

Local System: martin
Improved net profit is essential for the Limited Resource Grower to remain in business. Cooperative Extension in conjunction with a local firm that designs and sells drip-irrigation systems network together to get 5 small farmers established in plasticulture production on a trial scale. These growers networked together to buy the plastic, drip tape, and rent the machine to put the plots in. They split the cost among themselves and exchange labor. They put in approx. 1 acre each. The results were added income for each participant of $2500 and potential future expansion in plasticulture.

Local System: ashe
Horticulture crop producers need opportunities for marketing crops to consumers. The Ashe County Farmers Market, initiated by Extension and co-sponsored with the Ashe County Chamber of Commerce, provides access to an open retail market for farmers, gardeners, and craftsmen who have locally grown produce and items made in the home. Marketing farm products directly to consumers minimizes the channel of distribution, reduces handling, and increases profits to small farmers. 39 vendors participated in the farmers market this year. A frequent seller at the market indicated average sales of approximately $350 for the two-day period each week that the market operates.

Local System: caldwell
Traditionally, greenhouse growers have relied solely on pesticides to manage disease, insect and mite problems. Many small and part-time growers have lost crops and potential profits due to improper pest identification, poor timing of sprays and improper selection of appropriate control methods. A grant in the amount of $5,000 was obtained by the NCCES agent for the purpose of developing a program and manual to train these growers on how to implement an IPM program as a holistic approach to managing greenhouse pests. 85 growers were trained on greenhouse IPM and 15 small growers have integrated IPM into their pest management program. Results include: improved returns through chemical savings; an increased awareness of the judicious use of chemicals; a lessened potential for pesticide resistance in pests; an enhanced familiarity with IPM scouting techniques; and a quality product demanding premium prices.

Local System: robeson
Bonnie and Burnice Blanks rely upon the NCCES to help solve everyday problems. They have attended numerous Extension sponsored education events. Their goals are to improve the overall condition of their farm operation by increasing profits and decreasing expenses. They have planted 29 varieties of vegetables, including: okra, cabbage, watermelons, peas, collards, pumpkins, sweet potatoes, irish potatoes and turnips. In April, Bonnie was named third runner-up for the 1997 Small Farmer of the Year Award during North Carolina Small Farm Week Activities at NC A&T State University. Their efforts have begun to payoff because they are more efficient and profitable now than they were two years ago.

Local System: columbus
Jeff McPherson of Robeson County has implemented an overall small farm business and marketing plan for 8 acres. Jeff attended the 1996 Fruit and Vegetable Expo in Greensboro and put several ideas into action. Some 15 different horticultural crops are being grown with the use of drip irrigation and plasticulture. A small roadside stand has been installed and is being operated under the "honor system". Jeff is using double cropping as a means to increase his net income. In just 6 months he has generated significant income from early sweet corn and squash. Jeff expects to gross $20,000 during 1997.Jeff plans to market 100% of his produce locally. 8 acres is under fully automated drip system.

Local System: columbus
Bobby Williams, Columbus County's participant in the Ways to Grow program, showed how persistence works. Bobby Williams has done well with his strawberry project on black plastic with drip irrigation and overhead for frost protection. Bobby's farm produces strawberries that are real sweet. They seem to taste a little better than other growers and his customers just keep coming back. Bobby grossed over $13,000 this year; being a super year. At the Chadbourn strawberry festival this year Bobby had the Number 1, first place flat of strawberries which sold for $1,500 with Bobby getting $900.

Local System: richmond
Over the last few years, the wild honeybee population in Richmond County has been drastically reduced due to mite infestations. Many of the commercial vegetable and fruit producers in the county must now rely on domesticated honeybees for crop pollination. In an effort to boost the number of beekeepers in Richmond County, the Richmond County Extension Center hosted a free Beginner Bee-keeping Course in the fall of 1997. The course was highly successful with average attendance of 30 for each of the four classes. Many of those attending had no previous beekeeping experience and now plan to start their own apiary in the spring. A participant from the 1996 beginner bee-keeping course has built his apiary and can now rent hives to local producers.

Local System: person
A NCCES and Person County Beekeepers Association Field Day was conducted on September 27, 1997 in Person County as a result from several incoming telephone calls and demands from beekeepers about problems faced with controlling two types of insect mites. Approximately 30 people gained hands-on learning experiences with hive observation, mite identification, healthy brood management, and overall honeybee management. Participants estimated that they would save approximately $250 per participants per year, or a total saving of $7500.

PUBLIC POLICY

Local System: duplin
Area poultry farmers, company representatives and third party applicators attending a total of 7 Extension sponsored meetings united in an organized effort to address their concerns with the initial interpretation of SB 1217 as it related to poultry dry litter systems. As a direct result of this organized effort and addressing the Inter-Agency Committee, the interpretation of this bill was changed and/or amended. This positive change will impact the entire poultry industry utilizing dry litter systems.

Local System: vance
The North Carolina Cooperative Extension Service taught over 800 school age youth and teachers in Vance and Warren Counties about agriculture and the environment. Participants learned the relationship between agricultural practices and water quality as well as the impact that they have on water quality and the environment in their daily life. Educational efforts were also made with 5 County officials and 150 non-farm public about policies and information about benefits of waste management. These efforts were accomplished by environmental field days, field trips, classroom visits and at meetings. According to surveys received at meetings, 94 percent indicated that they learned new concepts or gained a better understanding about the waste regulations or waste management. 88 percent said that they would be able to apply the information learned.

OBJECTIVES, PERFORMANCE GOALS, AND INDICATORS

OBJECTIVE 1
To produce new and value-added agricultural products and commodities.

PERFORMANCE GOAL 1
To annually increase the research and knowledge-base available from CSREES partners and cooperators on new and value-added commodities and products in U.S. agriculture.

INDICATOR 1

In the Plan, describe significant research underway or proposed that will result in new and value-added commodities and products in U.S. agriculture. In the Report, describe the most significant research completed during the report year in this area and its impact.

DATA COLLECTION METHODOLOGY

PERFORMANCE GOAL 2
To annually increase agricultural producer awareness, understanding, and information regarding the production of new and value-added commodities and products in U.S. agriculture in which CSREES partners and cooperators play and active research, education, or extension role.

INDICATOR 1
The total number of persons completing non-formal education programs on production of new and value-added commodities and products and the number of these persons who actually adopt one or more recommended practices or technologies within six months after completing one or more of these programs.

Year	# completing non-formal educ. progs.		# adopting practice or technologies	
Baseline	0		0	
	Target	Actual	Target	Actual
1998	0	0	2500	2030
1999	0	0	2500	0
2000	0	0	2500	0
2001	0	0	2500	0

DATA COLLECTION METHODOLOGY

OBJECTIVE 2
To increase the global competitiveness of the U.S. agricultural production system.

PERFORMANCE GOAL 1
To annually increase the research and knowledge-base available from CSREES partners and cooperators on improving the productivity and global competitiveness of the U.S. agricultural production system.

INDICATOR 1
In the Plan, describe significant research underway or proposed that will result in improvements in the productivity and global competitiveness of the U.S. agricultural production system. In the Report, describe the most significant research completed during the report year in this area and its impact.

DATA COLLECTION METHODOLOGY

PERFORMANCE GOAL 2
To increase agricultural producer awareness, understanding, and information on improving the

productivity and global competitiveness of the U.S. agricultural production system in which CSREES partners and cooperators play and active research, education, or extension role.

INDICATOR 1

The total number of persons completing non-formal education programs to improve the productivity and global competitiveness of the U.S. agricultural production system and the number of these persons who actually adopt one or more new production techniques or strategies within six months of completing one or more of these programs.

Year	# completing non-formal educ. progs.		# adopting new techniques, etc.	
Baseline	0		0	
	Target	Actual	Target	Actual
1998	0	0	28080	50370
1999	0	0	28080	0
2000	0	0	28080	0
2001	0	0	28080	0

DATA COLLECTION METHODOLOGY

OBJECTIVE 3

To recruit and educate a diverse set of individuals for careers as future scientists, professionals, and leaders who are well-trained in agricultural sciences.

PERFORMANCE GOAL 1

To strengthen the capacity of higher education institutions to develop future scientists, professionals, and leaders in agricultural production sciences and related disciplines who will more effectively contribute to the productivity and global competitiveness of the U.S. agricultural production system.

INDICATOR 1

The total number students enrolled in formal courses in agricultural production sciences that utilize modern educational strategies, distance learning technologies, and educational or internship experiences in real world learning environments.

Year	# of students in formal courses	
Baseline	7669	
	Target	Actual
1998	7746	7746
1999	7823	0
2000	7901	0

2001	7980	0

DATA COLLECTION METHODOLOGY

OBJECTIVE 4
To improve decision-making on public policies related to the productivity and global competitiveness of the U.S. agricultural production system.

PERFORMANCE GOAL 1
To annually increase the research and knowledge-base available from CSREES partners and cooperators on public policy issues affecting the productivity and global competitiveness of the U.S. agricultural production system.

INDICATOR 1
In the Plan, describe significant research underway or proposed on public policy issues affecting the productivity and global competitiveness of the U.S. agricultural production system. In the Report describe the most significant research completed during the report year in this area and its impact.

DATA COLLECTION METHODOLOGY

PERFORMANCE GOAL 2
To annually increase the effectiveness of constituent and citizen participation on public policy issues affecting the productivity and global competitiveness of the U.S. agricultural production system.

INDICATOR 1
The total number of persons annually completing non-formal education programs on topics related to public policy issues affecting the productivity and global competitiveness of the U.S. agricultural production system and the number of those persons who make use of such knowledge within six months of completing one or more of these programs.

Year	# completing non-formal educ. progs.		# utilizing information	
Baseline	0		0	
	Target	Actual	Target	Actual
1998	0	0	12980	2759
1999	0	0	12980	0
2000	0	0	12980	0
2001	0	0	12980	0

DATA COLLECTION METHODOLOGY

OTHER STATE SPECIFIC OBJECTIVES AND INDICATORS

PROGRAM COST

Extension

Year	Federal	State	Local	Other
1998	3084000	6052000	1435000	0
1999	0	0	0	0
2000	0	0	0	0
2001	0	0	0	0

Research

Year	Federal	State	Local	Other
1998	10790000	31740000	0	8240000
1999	0	0	0	0
2000	0	0	0	0
2001	0	0	0	0

Higher Education

Year	Federal	State	Local	Other
1998	0	4230000	0	0
1999	0	0	0	0
2000	0	0	0	0
2001	0	0	0	0

FTE COMMITMENT

Extension FTEs

Year	Professional			Paraprofessional		
	1862	1890	Other	1862	1890	Other
1998	133.0	3.9	0.0	17.0	6.0	0.0
1999	0.0	0.0	0.0	0.0	0.0	0.0
2000	0.0	0.0	0.0	0.0	0.0	0.0
2001	0.0	0.0	0.0	0.0	0.0	0.0

Research SYs Only

Year	Scientist Years					
	1862	1890	Other	1862	1890	Other
1998	135.0	0.0	0.0	0.0	0.0	0.0
1999	0.0	0.0	0.0	0.0	0.0	0.0
2000	0.0	0.0	0.0	0.0	0.0	0.0
2001	0.0	0.0	0.0	0.0	0.0	0.0

Higher Education FTEs

Year	Professional			Paraprofessional		
	1862	1890	Other	1862	1890	Other
1998	50.5	0.0	0.0	0.0	0.0	0.0
1999	0.0	0.0	0.0	0.0	0.0	0.0
2000	0.0	0.0	0.0	0.0	0.0	0.0
2001	0.0	0.0	0.0	0.0	0.0	0.0

VOLUNTEER PARTICIPATION

Extension

Year	# of Volunteers
1998	1050
1999	0
2000	0
2001	0

Research

Year	# of Volunteers
1998	0
1999	0
2000	0
2001	0

Higher Education

Year	# of Volunteers

1998	0
1999	0
2000	0
2001	0

ADDITIONAL COMMENTS

PROGRAM CONTACTS

Geoffrey A Benson
Associate Professor
Agricultural and Resource Economics
232-J Nelson Hall
Box 8109, NCSU
Raleigh, NC 27695
Voice phone: 919-515-5184
Fax phone : 919-515-6268
Electronic mail: Geoff_Benson@ncsu.edu

NORTH CAROLINA 1998 ANNUAL REPORT:
GOAL 2 - A SAFE, SECURE FOOD AND FIBER SYSTEM.

GOAL ACCOMPLISHMENT NARRATIVE
During the past year significant impacts have been made in the area of food safety,by all functions (extension, research and teaching) of North Carolina's Land Grant Universities.The following examples are indicative of the scope of accomplishments achieved.

Work has been initiated in the area of milk protein allergenicity of different milk proteins and milk proteins from different animal speices. Effects of processing and separation technologies on milk allergenicity were investigated, with the goal of producing low allergy, high nutrition dairy products. It is anticipated that these studies will also provide a model for testing the potential allergenicity, and thus assure safety, of foreign proteins that could be introduced into human food through biotechnology. These studies are important since estimates place 2 to 10% of U.S. children having a milk allergy and thus on restricted diets that put them at greater risk for rickets, fractures, or osteoporosis in later life.

Grade A shell eggs and foods containing raw eggs have been implicated in 20% of the salmonellosis outbreaks in the U.S. To reduce this threat, a study was initiated to develop a heating process for killing Salmonella enteritidis (SE), an egg-associated foodborne pathogne responsible for 380 outbreaks in the U.S. between 1985 and 1991 and involving 13,056 illnesses and 70 deaths, from intact shell eggs. The findings demonstated that SE could be destroyed in intact shell eggs without significant loss of egg quality of functionality by using a low temperature (57-58 C) water bath immersion heat treatment last 50 to 75 minutes. The information gained from these studies will have direct application and benefit for the food service industry and consumers. For example, foods typically prepared using raw eggs (e.g., Caesar salad dressing, hollandaise sauce, etc.) and egg products prepared using inadequate cooking procedures ("Sunny-Side" frying, ssoft poaching, etc.) can be safely prepared without the threat of SE by using these heat-treated shell eggs. Based on these studies, pasteurized sshell eggs are now being test marketed by U.S. egg processor with potential for expansion into the European market where SE outbreaks are more frequent.

In 1991 Federal legislation was passed requiring all shell eggs to be kept at an ambient temperature of 45F or below after processing to prevent the growth of any potential Salmonella organisims that may be present within the shell and shell membrane structure. Although passed in 1995, USDA regulations stemming from this legislation have not been adopted to date because no commercial method currently exists for rapidly cooling eggs within the mandated regulatory time constraints. Studies at North Carolina State University in cooperation with an industry partner began investigating rapid cooling using cryogenic carbon dioxide. Preliminary findings indicate that cooling times can be reduced from 7 to 10 days to 2 to 6 minutes! Rapid cooling of eggs is anticipated to significantly inhibit the growth of Salmonella within shell eggs and thus reduce salmonellosis outbreaks associated with shell egg consumption. Moreover, eggs cooled with cryogenic carbon dioxide had an extended shelf life in excess of two weeks beyond eggs cooled in a conventional manner.

SUCCESS STORIES
Extension faculty have taken a leadership role in providing Hazard Analysis and Critical Control Point (HACCP) training programs to various segments of the food processing industry (e.g., poultyr, meat, seafood, dariy, etc.). Over 500 participants have participated in the intensive three-day format.

HACCP has been mandated by USDA for meat and poultry processors, and by FDA for seafoods, Implementation of HACCP is proving to be complex, thus it is vital to the industry, and utlimately consumers, that food processors receive training from extension professionals competent in HACCP and the sciences associated with food safety.

Collabortive efforts among specialists in Food Science and Poultry Science have resulted in a technology innovation to rapidly cool eggs. The technology greatly reduces the time needed to chill eggs to 45F, and as a result has signicantly food safety and regulatory implications. Also, as a resulty of the success of the Food Science and Poultry Science collaboration, the team has been asked to participate in a project to evaluate new packaging materials to protect shell eggs during transportation.

The Food Safety Website, developed by specialist in the Department of Food Science, was ranked "Among The Best", by Tufts University, as an authoritative resource for finding accurate food safety information on the Internet. "Among The Best" ratings are only awarded to Websites that serve as outstandig resources and maintain a high level of integrity in reporting. The system was designed to be a gateway to all of the food safety information on the Internet. This recognition acknowledges the North Carolina Cooperative Extension Service as a leader in the electronic food safety and nutrition information arena.

OBJECTIVES, PERFORMANCE GOALS, AND INDICATORS

OBJECTIVE 1

To improve access to an affordable, healthful, and culturally relevant food supply.

PERFORMANCE GOAL 1

To annually increase the research and knowledge-base available from CSREES partners and cooperators on food accessibility and affordability.

INDICATOR 1

In the Plan, describe significant research underway or proposed on food accessibility and affordability. In the Report, describe the most significant research completed during the report year in this area and its impact.

DATA COLLECTION METHODOLOGY

PERFORMANCE GOAL 2

To annually increase consumer awareness, understanding, and information on food accessibility and affordability in which CSREES partners and cooperators plan an active research, education, or extension role.

INDICATOR 1

The total number of persons completing non-formal consumer education programs on food access and food affordability, the total number of these persons who plan to adopt one or more recommended practices after completing one or more of these programs, and the total number of these persons who actually adopt one or more recommended practices within six months after completing one or more of these programs.

Year	# of persons completing programs	# who plan to adopt recommended pract.	# who actuall adopt practic
Baseline	0	0	0

	Target	Actual	Target	Actual	Target	Actu
1998	0	4397	0	0	25	4397
1999	4000	0	0	0	25	
2000	4000	0	0	0	25	
2001	4500	0	0	0	25	

DATA COLLECTION METHODOLOGY
North Carolina Extension Reporting System

PERFORMANCE GOAL 3
To increase the effectiveness of constituent and citizen participation on public policy issues affecting food security (i.e., food access, affordability, and recovery).

INDICATOR 1
The total number of persons completing non-formal education programs on public policy issues affecting food security (i.e., food access, affordability, and recovery), the total number of these persons that plan to become actively involved in such issues, and the total number of these persons who actually become actively involved on such issues within six months after completing one or more of these programs.

Year	# of persons completing programs	# who plan to be actively involved	# who actually become involve
Baseline	0	0	0

	Target	Actual	Target	Actual	Target	Actu
1998	0	0	0	0	0	
1999	0	0	0	0	0	
2000	0	0	0	0	0	
2001	0	0	0	0	0	

DATA COLLECTION METHODOLOGY

OBJECTIVE 2
To improve food safety by controlling or eliminating food-borne risks.

PERFORMANCE GOAL 1
To annually increase the research and knowledge-base available from CSREES partners and cooperators on food safety and food borne risks and illnesses.

INDICATOR 1
In the Plan, describe significant research underway or proposed on food safety and/or food borne risks and illnesses. In the Report, describe the most significant research completed during the report year in this area and its impact.

DATA COLLECTION METHODOLOGY

PERFORMANCE GOAL 2
To annually increase consumer awareness, understanding, and information regarding food safety and food borne risks and illnesses in which CSREES partners and cooperators play an active research, education, or extension role.

INDICATOR 1
The total number of persons completing non-formal, consumer education programs on food safety and/or food borne risks and illnesses, the total number of these persons who plan to adopt one or more recommended food safety behaviors or practices, and the total number of these persons who actually adopt one or more recommended food safety behaviors or practices within six months after completing one or more of these programs.

Year	# of persons completing programs		# who plan to adopt recommended behav.		# who actually adopt behavio	
Baseline	0		0		50186	
	Target	Actual	Target	Actual	Target	Acti
1998	0	0	0	0	37500	40500
1999	0	0	0	0	37500	
2000	0	0	0	0	40000	
2001	0	0	0	0	40000	

DATA COLLECTION METHODOLOGY

INDICATOR 2
The total number of individuals completing food handler certification programs conducted by CSREES partners and cooperators on an annual basis.

Year	# of persons completing programs	
Baseline	0	
	Target	Actual
1998	0	3109
1999	0	0
2000	0	0
2001	0	0

DATA COLLECTION METHODOLOGY
CALS Annual Report including efforts of North Carolina A&T and the College of Veterinary Medicine.

INDICATOR 3
The total number of facilities (or sites) meeting HACCP standards for food handling and the management of risks associated with food borne illnesses.

Year	# of facilities meeting HACCP stds.	
Baseline	0	
	Target	Actual
1998	70	350
1999	90	0
2000	110	0
2001	130	0

DATA COLLECTION METHODOLOGY
Information obtained from the NC Department of Environment Health and Natural Resources; NC Department of Agriculture; United States Department of Agriculture; and the United States Food and Drug Administration.

PERFORMANCE GOAL 3
To strengthen the capacity of higher education institutions to develop future scientists, professionals, and leaders in food sciences who will more effectively contribute to a greater understanding of food safety, including food borne risks and illnesses.

INDICATOR 1
The total number of students enrolled in formal courses in food sciences that use modern educational strategies, distance learning technologies, and educational or internship experiences in real world learning environments.

Year	# of students in formal courses	
Baseline	651	
	Target	Actual
1998	657	657
1999	664	0
2000	670	0
2001	677	0

DATA COLLECTION METHODOLOGY

OTHER STATE SPECIFIC OBJECTIVES AND INDICATORS

PROGRAM COST

Extension

Year	Federal	State	Local	Other
1998	380000	810000	140000	0
1999	387000	834000	144200	0
2000	389000	850000	146000	0
2001	391000	870000	147000	0

Research

Year	Federal	State	Local	Other
1998	575000	120000	0	510000
1999	600000	150000	0	550000
2000	600000	150000	0	550000
2001	600000	150000	0	550000

Higher Education

Year	Federal	State	Local	Other
1998	0	520000	0	0
1999	0	535000	0	0
2000	0	545000	0	0
2001	0	560000	0	0

FTE COMMITMENT

Extension FTEs

Year	Professional			Paraprofessional		
	1862	1890	Other	1862	1890	Other
1998	16.8	0.0	0.0	0.0	0.0	0.0
1999	16.2	0.0	0.0	0.0	0.0	0.0
2000	16.2	0.0	0.0	0.0	0.0	0.0
2001	16.2	0.0	0.0	0.0	0.0	0.0

Research SYs Only

Year	Scientist Years					
	1862	1890	Other	1862	1890	Other
1998	8.0	0.0	0.0	0.0	0.0	0.0
1999	8.0	0.0	0.0	0.0	0.0	0.0
2000	8.0	0.0	0.0	0.0	0.0	0.0
2001	8.0	0.0	0.0	0.0	0.0	0.0

Higher Education FTEs

Year	Professional			Paraprofessional		
	1862	1890	Other	1862	1890	Other
1998	6.5	0.0	0.0	0.0	0.0	0.0
1999	6.5	0.0	0.0	0.0	0.0	0.0
2000	6.5	0.0	0.0	0.0	0.0	0.0
2001	6.5	0.0	0.0	0.0	0.0	0.0

VOLUNTEER PARTICIPATION

Extension

Year	# of Volunteers
1998	450
1999	450
2000	500
2001	500

Research

Year	# of Volunteers
1998	25
1999	25
2000	25
2001	25

Higher Education

Year	# of Volunteers
1998	85
1999	85
2000	90
2001	90

ADDITIONAL COMMENTS

PROGRAM CONTACTS

Donn R Ward
Associate Dept. Head & Extension Leader
Food Science
100 Schaub Hall
North Carolina State University
Raleigh, NC 27695
Voice phone: 919-515-2951
Fax phone : 919-515-4694
Electronic mail: Donn_Ward@ncsu.edu

NORTH CAROLINA 1998 ANNUAL REPORT:
GOAL 3 - A HEALTHY, WELL-NOURISHED POPULATION.

GOAL ACCOMPLISHMENT NARRATIVE

To achieve a healthier, more well-nourished population significant impacts have been made in the past year by North Carolina's Land Grant Universities in the areas of extension, research, and teaching. Research was continued concerning plant and animal food industry areas so that consumers were offered improved products. Courses were taught to build the nutrition research community as well as to equip the students themselves as consumers. Extension programs were developed or continued throughout the state targeted to consumer needs and under the guidance of the well-developed NC Cooperative Extension System (CES) Advisory Leadership System, the NC Cooperative Extension Major Programs (CEMPs), and in collaboration with the NC Nutrition Network.

North Carolina has a large and diverse population with higher age-adjusted morbidity and mortality rates (cases per 100,000 population) in all causes (653) including diseases of the heart (197), cerebrovascular diseases (32.7), cancer (164.2), and diabetes mellitus (14.2) in comparison to national averages (627, 190.3, 26.8, 156.4, and 12.4 respectively). Because increasing numbers of North Carolinians live on fixed incomes and in poverty, these limited resource audiences (including the elderly and mothers with young children) were specifically targeted with educational programming. North Carolina is one of the fastest growing states in the nation in the number of citizens over the age of 65. Also, many women are entering the work force for the first time as part of the "Work First" program.

The following examples are indicative of the broad scope of significant achievements that have been made in research, teaching and extension in achieving a healthier, more well-nourished population:

FOOD PRODUCT RESEARCH AREAS:

A study was undertaken to evaluate the effects of varying dietary vitamin E levels on the oxidative stability, flavor, color, and volatile profiles of refrigerated and frozen turkey breast meat. The findings clearly showed that the susceptibility of the meat to lipid oxidation and off flavor development was inversely related to increasing vitamin E levels in the diet. Furthermore, higher dietary vitamin E levels also produced more acceptable turkey meat flavors and improved the overall color of the breast meat. These results clearly demonstrated that the current vitamin E dietary recommendations of the National Research Council for turkeys are not sufficient to produce the highest quality and nutritious turkey meat products.

Four cultivars of blueberries (Powderblue, Croatan, Homebell, and Reveille) were processed in a continuing study to produce a good quality juice with high juice yields. An effective pressing technique was developed in preliminary studies and used on all cultivars. While sensory ratings of all blueberry juices were favorable (rated good to excellent), Reveille and Powderblue were consistently ranked the highest in color, flavor and overall sensory quality.

A study was conducted to improve the macro mineral nutritional balance of fresh-pack dill cucumber pickles. The nutritional balance was improved without loss of flavor quality. Calcium, magnesium, and potassium contents of pickles were increased and the sodium content reduced, resulting in a more nutritionally balanced product.

Preliminary studies have shown that carbon dioxide cooling can be effective in rapidly cooling eggs to 7 degrees C, which results in a significantly reduced microbial load and growth during storage. In addition, carbon dioxide treatment provided and increased shelf life of greater than two weeks and for low quality eggs, increased the grade from A to AA. This grade enhancement alone has an estimated value of $15 million dollars annually. This does not include the potential to export shell eggs worldwide due to the increase in shelf life.

Two studies on peanuts were concerned with enhancing quality and shelf-life of peanuts and peanut products. In the first study, a relationship between increasing volatile lipid oxidation products and deteriorating flavor quality was established for roasted peanuts. The results of the study indicated that peanuts roasted at higher temperatures have a higher rate of lipid oxidation in storage. To maintain the lowest level of flavor defects due to lipid oxidation reaction in peanuts during storage, they should be roasted at temperatures toward the lower end of those tested in this study. In the second study, peanuts were cured to 5-8% moisture and held for 6 days before dry roasting and evaluated over 8 weeks at 30 C. Sensory analysis, oil stability index, PV and hexanal concentration indicated correlation between improved shelf-life and lower moisture content at roasting, suggesting seed moisture content at roasting may affect shelf-life more than moisture-related changes prior to roasting. Runner and Spanish peanuts, oil roasted in high oleic oil, had less shelf-life improvement than Virginia peanuts.

Excess "hock" spoilage was encountered by many ham plants, which adversely affected their profitability. A major portion of the spoilage was associated with increased lean in the ham due to improved genetics. Studies have shown that as the number of hams stacked on one another increased during the curing phase there was a concomitant increase in salt content in the finished product. These findings were applied resulting in decreased "hock"spoilage for four different companies. The impact of modifying the curing procedures is estimated to increase profitability in the industry by $450,000.

Research was done on the relationship between fat removal and substitute addition on flavor characteristics of development of new low-fat products. Flavor release was found to be influenced by protein concentration and flavor "chemistry". Polar compounds which are more likely retained by water phase are not influenced by protein concentration whereas non-polar compounds appear to be. In gel systems, flavor release is influenced by gel structure and gel structure appears to be the primary factor influencing water-holding capacity. Gels with increased water-holding capacity have reduced flavor release. Research was also conducted on the production potential of enzymatically derived cheese flavors designed to improve low-fat cheese products. Correlations of the analytical and sensory data are being performed to relate end products to aroma and flavor characteristics. These findings will enhance the industry's knowledge related to types of enzymes responsible for cheese flavor production and compounds.

EXTENSION AREAS:

The North Carolina Cooperative Extension Service provides educational programs to help North Carolinians improve the quality of their lives. North Carolina State University and North Carolina A & T State University deliver a coordinated extension educational program available to all the people within our state. In 1997 the North Carolina Cooperative Extension

Service completed the second year of its long range plan, Foundations For The Future. This plan consists of twenty Cooperative Extension Major Programs (CEMPs) that, within the context of Extension's mission, address priority needs of the state's citizens. Of the 20 CEMPs the ones that address the issues relative to achieving a healthier, more well-nourished population include: Aging with Gusto! (CEMP #1); Family and Consumer Economics (CEMP #8); Family and Parent Education (CEMP #9); Food Safety and Quality (CEMP # 11); Health and Human Safety (CEMP #12); and Nutrition and Wellness (CEMP #16). Extension's educational programs were planned and implemented in collaboration with the state's citizens and the Cooperative Extension Advisory Leadership System. Through the many programs such as Aging with Gusto! (for older adults), Healthy Eating for Life Program (for older adults), Out for Lunch (for mothers and young children) and Expanded Food and Nutrition Education Program, EFNEP, (for mothers and young children) people have gained knowledge and developed skills in meal planning, wise use of their food dollar, food safety, and time management related to food preparation. These skills are enabling them to feed themselves and their families healthier meals and delay or prevent chronic diseases.

The following represents the vast array of impacts and achievements that Extension Programs had on the people of North Carolina in 1997 and that were reported under the Cooperative Extension Major Programs.

Promoting a Healthier Diet:
General food and nutrition information is needed by all people and at all stages of the life cycle. Programming in this area equipped individuals with tools needed to evaluate their own diets and make changes as necessary. Consumers learned how to use the Dietary Guidelines for Americans, Nutrition Facts Label, and the Food Guide Pyramid to guide them in their food choices. Consumers learned where to find reliable sources of food and nutrition information and distinguish truth from nutrition quackery. Specific results include: 75,048 participants of CNS programming increased awareness of the need to have good nutrition habits; 48,490 participants increased knowledge that promotes health; 35,849 participants increased attitudes and aspirations that are indicative of need for good health; and 20,073 adopted diets consistent with dietary guidelines for good health.

Diet and Chronic Diseases:
Chronic diseases such as heart disease, cancer, stroke and diabetes are the top leading causes of death. CES educational programming gave participants the knowledge and skills to make healthful behavior changes to lower their blood cholesterol levels, blood pressure levels, weight, and increase their exercise and healthful food consumption patterns. As a result of participating in CES programming participants at risk for chronic diseases changed behavior to reduce risk. Examples include: 12,032 decreased fat intake; 6,736 decreased sodium intake; 8,042 increased fruit and vegetable intake; 2,895 increased calcium intake; 14,081 adopted positive attitudes and aspirations for improved health; 27,031 gained knowledge concerning how to reduce risk for chronic disease and 15,176 increased skills to reduce risk for chronic diseases. Bio markers that were measured on a few of the participants include the following changes: 723 participants decreased their high blood cholesterol; 663 participants decreased their high blood pressure; 292 decreased their high blood sugar; and 1,000 decreased excess body weight.

Diet and Parents and Children:
No time is more important than childhood to promote healthy eating practices. 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. The CES has helped individuals and families make informed decisions about their children's nutritional needs. Accomplishments include: 4,637 parents increased awareness and knowledge of importance of good nutrition for children; 3,878 parents increased knowledge about good eating habits for children; and 2,625 parents and children participated in food and nutrition activities together. Impacts include the 2,538 parents and 1,753 children adopting food behaviors consistent with the Dietary Guidelines and Food Guide Pyramid.

Diet and Limited Resource Audiences:
Many young families receiving food stamps do not make wise consumer choices to purchase the most nutritious foods for their families. Typically, their food selection and preparation skills are limited which further limits their ability to feed their families well. CES programming targeted this audience to help them gain self efficacy by giving them the knowledge and skills to feed their families well. Examples of the accomplishments include: 15,853 participants increased knowledge in nutrition and diet; 3,222 participants became more aware of available programs such as Food Stamps, AC, and free/reduced school meals. Impacts include 10,217 participants changed practices that lead to appropriate diets; 1,529 adopted behaviors to seek prenatal care; and 1,556 adopted behaviors that reduce low-weight births.

Health and Human Safety:
Health and human safety were pressing public concerns at the individual, family, and community levels. As a result of extensive programming in broad areas a healthy well nourished population was enhanced as shown by the following: over 46,363 participants increased their awareness and knowledge of preventative health behaviors such as eating properly, exercise, and safety in the home; 13,370 participants adopted recommended health care practices such as dietary intake; 2,051 individuals adopted practices to remove safety hazards in the home and 1761 adopted practices to increase home safety. 17,437 individuals adopted preventative measures including installing ventilation systems, radon, and carbon monoxide tests. 2490 participants were reported to have increased awareness of agricultural (chemical) exposure and other agriculturally related health risks. 2,068 participants increased their awareness and use of personal protective equipment. Sixteen strategic partnerships/coalitions have been formed for improving health statuses and 11 community health assessments have been conducted. Ten lay health advisors projects, immunization campaigns or early detection programs have been established to improve health status of citizens.

Cooperative Extension Major Programs (CEMPs) Efforts: All the 1997 county and state efforts in promoting a healthier diet in general, in the area of diet and chronic diseases (promoting health and nutrition, and preventing disease), in promoting a healthier diet with parents, and the limited resource audience were led and/or supported by the Nutrition and Wellness CEMP. In support of a healthy well nourished population and in reaching out to an under-served audience, members of the CES Nutrition and Wellness CEMP also developed, printed and distributed to all 101 CES county centers and held the in-service training for a packaged program, titled A Man's Guide To Basic Culinary Art, targeted to men who do not know how to purchase, prepare, and store food but find themselves needing these skills and knowledge. This program consisted of a 199 page leader's guide and 85 page participant manual. It was implemented in a variety of counties and numerous men developed the knowledge and skills to prepare healthy and safe foods for themselves and families. Another under served group that was

targeted for education was the growing Hispanic audience. By developing seven Hispanic displays to be located in each o the seven CES districts for county use with migrant and "settled out" Hispanic audiences we provided ready access to the Food Guide Pyramid and other nutrition information in a culturally sensitive manner. In the Aging with Gusto! CEMP programs were designed to help people age with gusto by teaching them how to achieve optimum financial, physical, and mental well-being in their later years. Older adults learned how to prepare for and cope with problems related to finances, legal issues, nutrition, health, care giving, housing, and self-care, all issues that support and bring about a healthy well nourished population. In the Health and Human Safety CEMP the Extension Service developed community-based programs to enable individuals and communities to address health and safety needs in the areas of healthy lifestyles, home safety and crime prevention, agricultural health and safety, and community capacity building. The three CEMPs mentioned above collaborated to conduct the Active For Life distance agent training. The program is a professionally designed intervention developed by WVU Extension in consultation with a physical therapist and MD. It is a low- to moderate-intensity strengthening and flexibility exercise program for older adults which can be done lying down, seated, or standing.

Agent Training:
Numerous agent trainings were given over the year. An example of one is shown here. Consumers need help in accessing the risks and benefits involved in evaluating the increasing number of over-the-counter and prescription drugs and dietary supplements and in understanding the new labeling for dietary supplements. Therefore, an in-service education program was developed and conducted to equip the agents to deal with these issues in their counties. Priority was placed on increasing knowledge about the known effects of selected herbals, vitamins and supplements. Specific topics covered included antioxidants, folate, chromium picolinate and supplements used by athletes. We looked at alternative medicine and how "remedies" have been used historically and currently in homeopathic medicine. The pros and cons of using various ones were discussed. Seventy one agents, three specialists and 1 retired specialist participated in the training which was titled: "Pills, Potions, and Powders." A variety of materials were also handed out to be used in the counties in programming with the citizens. Results of county programs will be presented in future reports.

SUCCESS STORIES

At the state level CES collaborated with the Medical Review Board of NC and the School of Medicine at UNC-CH to train health professionals (including Extension Educators) from across the state as well as to supply 22 counties with $1000.00 each to conduct chronic diseaseprevention activities, specifically in the area of stroke prevention. Stroke, the third leading cause of death, is so prevalent in NC that we are listed as part of the Stroke Belt. Counties were encouraged to collaborate with their local health departments, hospitals, senior resource center and others, as available. Examples of the stroke prevention efforts include the following health fair where 75 adults were screened for total cholesterol, HDL, LDL, atrial fibrilation and blood pressure. Ten individuals were diagnosed with high blood pressure that did not know that they had it and 19 had very high cholesterol levels. Follow-up showed that all followed the referral to see their doctors for further help. Education programming, available to all, helped over 100 participants lower risk (lower weight, lose inches, lower blood cholesterol, lower blood pressure, stop smoking and eat more healthful meals). With an estimated $100,000 saved per patient per year if cardiovascular disease is avoided there is a potential savings of over

$10,000,000.

Specific examples of the impact of the educational programming include: One participant who has improved her eating habits so much that she has been taken off her high blood pressure medicine. She received the motivation and enthusiasm from being part of the group. She lost a total of 15 pounds and is excited about her health, how she feels and how she looks. Another participant lowered her cholesterol from 308 to 262 in just two months by using the information she learned in the classes. Another who had already experienced a mini stroke, lowered her cholesterol from 223 to 135. She was ecstatic to receive a personal congratulatory phone call from her doctor. One man improved so much over 11 months of working on his diet and lifestyle that his cholesterol lowered from 260 to 180, he lost 25 pounds, and his physicians are not longer talking about surgery. Another man even commented, "I think you have probably saved my life."

The Family Nutrition Program supported by the USDA Food and Nutrition Service was conducted in 40 counties with a focus on food stamp eligible families with three to five year-old children. One agent's comment after finishing the 4 sessions was, "Family Nutrition Program participants have 'hands on' learning experiences-the ultimate transfer of education. Many of the participants do not want the sessions to end. We now have the challenge to provide more for an audience that we formerly thought was hard to reach. Participants' enthusiasm is seen by one pregnant mother who began the class one month from delivery, delivered on the Tuesday before the last class and came to the last class (graduation) with her 3-day old son. Volunteers in the pre-three room cared for the baby while the mother completed the last session. Family Nutrition participants have been hired as EFNEP program assistants while others come back as volunteers. In a letter with $1436 of support from The United Way for a county, the grantor stated, 'You are really making a difference in the lives of many women and children in our community'.

Data from one county's graduates showed 95% making positive dietary changes in food group servings, 95% improving other dietary practices, 75% improving one or more food resource management practices, and 75% adopting one or more food safety practices. One class composed of 20 young Hispanic mothers and their children resulted in the children learning English names for fruits and vegetables and tasting different fruits and vegetables.

Noonliting Weight Control series taught basics of weight control and development of life-long healthful eating habits. In one class 1 7 individuals completing the 1 5 week series lost an average of 8-1/2 pounds each. A participant stated, 'I came to Noonliting because of a problem with my spine which causes a great deal of pain in my legs. My Spine Specialists told me that I must lose weight to help relieve this pain. I could not have lost this weight without Noonliting. I needed both the nutrition education and the group encouragement. I've lost 21 pounds. Noonliting taught me that I needed to make a lifestyle change and I did'. Another participant reported that prior to participating in Noonliting that she was fatigued and had an overall unhealthy lifestyle. After losing 20 pounds her blood pressure and cholesterol level were lower, and she had increased her activity level. Her doctor complimented her on lifestyle changes and said, 'Whatever it is you're doing, keep it up!'

Noonliting began in one county in 1988. To date 1,160 individuals have participated with a 69% completion rate, which is excellent for weight control programs. Over 8,1 56 pounds have been lost and over 8,000 miles walked. Volunteers and the health department now collaborate with extension on teaching classes.

Nutrition Program Assistants are working with children in day care centers and homes as well as day care providers and individual families and groups. Children are learning to try new foods, the importance of washing hands and how and why it is important to eat healthy. One child even got his mother to enroll in the program. Day care providers are pleased to receive educational credit for taking the classes. Participants are learning the importance of good nutrition and are making dietary changes. Pregnant teens and new moms are learning the importance of good nutrition, how to prepare nutritious meals and how to economize by preparing food instead of buying fast food.

Thirty Head Start parents received nutrition education through programs provided by the FCS agent. Child Development newsletters were sent to 250 parents of preschool parents through child care centers and the health department. These have had a very positive impact evidenced by the positive feedback from child care providers and parents. Seventy children were taught to identify foods, their place in the Food Guide Pyramid and the number of servings they should be eating each day for optimal nutritional health.

EFNEP Program Assistants worked with 123 homemakers, of which 35 graduated. Pre and post tests indicate that of the graduates 97% improved at least 1 food resource management practice; 97% improved at least 1 nutrition practice; and 91% improved at least 1 food safety practice. Also, 46% experienced other benefits as indicated by improvement in their other family needs (health, money management, parenting, etc) being met. As a result of EFNEP, these families have healthier children which means lower medical costs as well as cost savings at the grocery store.

Counties reporting evaluation results for the low income audience, in general, indicated an improvement in food resource management practices for 75% to 97% of participants; an improvement in nutrition practices of 88% to 97%; and 50% to 91% of participants reported improved food safety practices.

Seniors are another audience of CES. The senior nutrition hot lunch program brings participants together in a pleasant atmosphere for nutritious meals. It also provides an opportunity for social interaction and for educational sessions. In one county 272 seniors in county hot lunch programs assessed their fiber, fat and fluid intake as part of the FCS class. 259 increased knowledge and 184 indicated a change in attitude that would promote a healthier diet. In a second round of Cooking with Pizzazz! taught to seniors in another county hot lunch series 47 seniors took part in the classes and food demonstrations. In the final evaluation 55% of them stated that they had been trying to eat more fruits and vegetables and 21% had actually eaten 5 or more servings the day before the evaluation.

Stroke screening for senior citizens showed that 12 percent of the participants were at high risk for stroke. The Framingham Heart Study protocol was used to determine those people at high, moderate, and low risk. Thirty percent of the participants were referred to a doctor. The warning signs of stroke were explained to all of the participants during the exit interview.

OBJECTIVES, PERFORMANCE GOALS, AND INDICATORS

OBJECTIVE 1

To optimize the health of consumers by improving the quality of diets, the quality of food, and the number of food choices.

PERFORMANCE GOAL 1

To annually increase the research and knowledge-base available from CSREES partners and cooperators on human nutrition, and family and

consumer sciences.

INDICATOR 1

In the Plan, describe significant research underway or proposed on human nutrition, and family and consumer sciences. In the Report, describe the most significant research completed during the report year in this area and its impact.

DATA COLLECTION METHODOLOGY

PERFORMANCE GOAL 2

To annually reduce the health risk factors through non-formal educational programs to improve dietary habits and physical exercise practices in which CSREES partners and cooperators play an active research, education, or extension role.

INDICATOR 1

The total number of persons completing non-formal nutrition education programs on better management of health risk factors (e.g., obesity, hypertension, etc.), the total number of these persons who plan to adopt one or more recommended nutrition practices to reduce health risks, and the total number of these persons who actually adopt one or more recommended nutrition practices to reduce health risks within six months of completing one or more of these programs.

Year	# of persons completing programs		# who plan to adopt practices		# who actually adopt practice	
Baseline	23000		0		12500	
	Target	Actual	Target	Actual	Target	Acti
1998	24000	27031	0	0	13000	12032
1999	25000	0	0	0	13500	
2000	26000	0	0	0	14000	
2001	27000	0	0	0	14500	

DATA COLLECTION METHODOLOGY

PERFORMANCE GOAL 3

To annually increase consumer awareness, understanding, and information on dietary guidance and appropriate nutrition practices in which CSREES partners and cooperators play an active research, education, or extension role.

INDICATOR 1

The total number of persons completing non-formal nutrition education programs that provide dietary guidance to consumers, the total number of these persons who plan to adopt one or more recommended Dietary Guidelines, and the total number of these persons who actually adopt one or more recommended Dietary Guidelines within six months after completing one or more of these programs.

Year	# of persons completing programs	# who plan to adopt recommendations	# who actually adopt recommend
Baseline	65000	0	25000

	Target	Actual	Target	Actual	Target	Actu
1998	66000	75048	0	0	25500	20073
1999	67000	0	0	0	26000	
2000	68000	0	0	0	26500	
2001	69000	0	0	0	27000	

DATA COLLECTION METHODOLOGY

PERFORMANCE GOAL 4
To strengthen the capacity of higher education institutions to develop future scientists, professionals, and leaders in human nutrition, and family and consumer sciences who will more effectively contribute to understanding issues related to human nutrition, and family and consumer sciences.

INDICATOR 1
The total number of students completing formal courses in human nutrition, and family and consumer sciences that utilize modern educational strategies, distance learning technologies, and educational or internship experiences in real world learning environments.

Year	# of students in formal courses
Baseline	1023

	Target	Actual
1998	1033	1033
1999	1043	0
2000	1053	0
2001	1064	0

DATA COLLECTION METHODOLOGY

OBJECTIVE 2
To promote health, safety, and access to quality health care.

PERFORMANCE GOAL 1
To annually increase the research and knowledge-base made available by CSREES partners and cooperators on health sciences and health promotion.

INDICATOR 1
In the Plan, describe significant research underway or proposed on health sciences and health promotion. In the Report, describe the most significant research completed during the report year in this area

and its impact.

DATA COLLECTION METHODOLOGY

PERFORMANCE GOAL 2
To annually improve individual and family health status through non-formal health education and promotion programs in which CSREES partners and cooperators play an active research, education, or extension role.

INDICATOR 1
The total number of persons completing non-formal education programs on health promotion, the total number of these persons who plan to adopt one or more recommended practices, and the total number of these persons who actually adopt one or more recommended practices within six months after completing one or more of these programs.

Year	# of persons completing programs		# who plan to adopt practices		# who actually adopt practice	
Baseline	30000		0		1761	
	Target	Actual	Target	Actual	Target	Actu
1998	31000	46363	0	0	2000	13370
1999	32000	0	0	0	2300	
2000	33000	0	0	0	2400	
2001	34000	0	0	0	2500	

DATA COLLECTION METHODOLOGY

INDICATOR 2
The total number of persons completing non-formal education programs on topics related to health promotion who meet or exceed published standards and targets established in "Healthy People 2000".

Year	# who meet or exceed standards	
Baseline	0	
	Target	Actual
1998	0	0
1999	0	0
2000	0	0
2001	0	0

DATA COLLECTION METHODOLOGY

PERFORMANCE GOAL 3
To annually increase the level of individual and family

safety (or reduce risk levels) from accidents in the homes, schools, workplaces, and communities.

INDICATOR 1

The total number of persons completing non-formal education programs on home and workplace safety and risk reduction, the total number of these persons who plan to adopt one or more recommended practices, and the number who actually adopt one or more recommended practices within six months after completing one or more of these programs.

Year	# of persons completing programs		# who plan to adopt practices		# who actually adopt practice	
Baseline	5000		0		1897	
	Target	Actual	Target	Actual	Target	Actu
1998	5000	17437	0	0	1500	2051
1999	5000	0	0	0	1500	
2000	5000	0	0	0	1500	
2001	5000	0	0	0	1500	

DATA COLLECTION METHODOLOGY

PERFORMANCE GOAL 4

To strengthen the capacity of higher education institutions to develop future scientists, professionals, and leaders in health sciences who will more effectively contribute to understanding issues related to health sciences and related disciplines.

INDICATOR 1

The total number of students completing formal courses in health sciences that utilize modern educational strategies, distance learning technologies, and educational or internship experiences in real world learning environments.

Year	# of students in formal courses
Baseline	4969

	Target	Actual
1998	5019	5019
1999	5069	0
2000	5120	0
2001	5171	0

DATA COLLECTION METHODOLOGY

PERFORMANCE GOAL 5

To annually increase the availability of health

education programs to communities in which CSREES partners and cooperators play an active research, education, or extension role.

INDICATOR 1

The total number communities participating in health community decision-making education programs, and the number of these communities that implement cost effective health care services, improve the availability or access to health care services, or improve the quality of health care facilities to serve economically and culturally diverse members of the community.

Year	# of communities participating		# implementing or improving services	
Baseline	900		112	
	Target	Actual	Target	Actual
1998	900	16	120	11
1999	900	0	120	0
2000	900	0	120	0
2001	900	0	120	0

DATA COLLECTION METHODOLOGY

INDICATOR 2

The total number of community-wide health events in communities implementing health community decision making education programs.

Year	# of community-wide health events	
Baseline	0	
	Target	Actual
1998	0	10
1999	0	0
2000	0	0
2001	0	0

DATA COLLECTION METHODOLOGY

PERFORMANCE GOAL 6

To annually increase the effectiveness of constituent and citizen participation on public policy issues affecting health community decision-making.

INDICATOR 1

The total number of persons completing non-formal education programs on public policy issues affecting health community decision-making, the total number of these persons who plan to become actively involved in

one or more public policy issues, and the total number of these persons who actually become actively involved in one or more public policy issues within six months after completing one or more of these programs.

Year	# of persons completing programs		# who plan to become involved		# who actually become involve	
Baseline	0		0		0	
	Target	Actual	Target	Actual	Target	Actu
1998	0	0	0	0	0	
1999	0	0	0	0	0	
2000	0	0	0	0	0	
2001	0	0	0	0	0	

DATA COLLECTION METHODOLOGY

OTHER STATE SPECIFIC OBJECTIVES AND INDICATORS

PROGRAM COST

Extension

Year	Federal	State	Local	Other
1998	2295000	5310000	1304000	0
1999	0	0	0	0
2000	0	0	0	0
2001	0	0	0	0

Research

Year	Federal	State	Local	Other
1998	190000	745000	0	65000
1999	0	0	0	0
2000	0	0	0	0
2001	0	0	0	0

Higher Education

Year	Federal	State	Local	Other
1998	0	245000	0	0

1999	0	0	0	0
2000	0	0	0	0
2001	0	0	0	0

FTE COMMITMENT

Extension FTEs

Year	Professional			Paraprofessional		
	1862	1890	Other	1862	1890	Other
1998	92.0	3.0	0.0	115.0	0.0	0.0
1999	0.0	0.0	0.0	0.0	0.0	0.0
2000	0.0	0.0	0.0	0.0	0.0	0.0
2001	0.0	0.0	0.0	0.0	0.0	0.0

Research SYs Only

Year	Scientist Years					
	1862	1890	Other	1862	1890	Other
1998	6.0	0.0	0.0	0.0	0.0	0.0
1999	0.0	0.0	0.0	0.0	0.0	0.0
2000	0.0	0.0	0.0	0.0	0.0	0.0
2001	0.0	0.0	0.0	0.0	0.0	0.0

Higher Education FTEs

Year	Professional			Paraprofessional		
	1862	1890	Other	1862	1890	Other
1998	3.0	0.0	0.0	0.0	0.0	0.0
1999	0.0	0.0	0.0	0.0	0.0	0.0
2000	0.0	0.0	0.0	0.0	0.0	0.0
2001	0.0	0.0	0.0	0.0	0.0	0.0

VOLUNTEER PARTICIPATION

Extension

Year	# of Volunteers

Year	
1998	6420
1999	0
2000	0
2001	0

Research

Year	# of Volunteers
1998	0
1999	0
2000	0
2001	0

Higher Education

Year	# of Volunteers
1998	0
1999	0
2000	0
2001	0

ADDITIONAL COMMENTS

PROGRAM CONTACTS

Jacquelyn W. McClelland
Assistant Prof. & Food & Nutrition Spec.
PO Box 7605
NCSU
Raleigh, NC 27695
Voice phone: 919/515-9148
Fax phone : 919/515-2786
Electronic mail: jmcclell@amaroq.ncsu.edu

NORTH CAROLINA 1998 ANNUAL REPORT:
GOAL 4 - TO ACHIEVE GREATER HARMONY (BALANCE) BETWEEN AGRICULTURE AND THE ENVIRONMENT.

GOAL ACCOMPLISHMENT NARRATIVE
Goal 4 Narrative

Production of livestock, poultry, and agronomic, horticultural, and forestry crops is economically, socially and environmentally important to the citizens of North carolina. Roughly 30 percent of the states GNP is derived from on farm production or value added to farm products. While agriculture remains the single largest source of income, the active farm population continues to decline; yet, there is constant migration from urban to rural areas resulting in a growing rural population. Increasing livestock and poultry production combined with migration of non-farm population into agricultural production areas has resulted in much conflict between livestock producers and no farm residents. There is much concern about nuisant odor and pollution of surface and ground water from mismanaged manure products.

The N.C. Division of Water Quality estimates that 28 percent of the 37,657 miles of freshwater streams and rivers are impaired with nonpoint source pollution accounting for over 75 percent of the impaired mileage. Loss of riparian buffers adjacent to streams is a major factor affecting stream water quality and are an important resource for buffering valuable aquatic resources from the potential negative impacts of nearby agricultural land uses. In order for agricultural producers to comply with environmental regulations and maintain economic productivity, many management and structural practices must be implemented. Development of new technologies and education is needed for producers, agribusiness, and agricultural service agencies to make sound decisions that protect the environment and maintain productivity through adoption of sound practices that manage water, waste, soil, nutrients and pesticides.

Agriculture and the Environment customers were provided information and training to allow them to assess local issues and achieve a balance between economic viability and environmentally friendly agricultural productivity. Implementation of conservation BMPs reduced soil erosion losses by approximately 300,000 tons. Nearly 1,000 land application operators were trained and certified bringing the total number of operators certified over the past 18 months to over 5,000. Just over 1800 (60 percent) of the liquid waste management systems have been certified. An additional 200 poultry producers adopted dry liter waste management plans. Collectively, proper waste management resulted in the utilization of nearly 25,000 tons of nitrogen derived from animal waste and other organic by-products with an estimated fertilizer nutrient value of nearly 15 million dollars.

Extension faculty conducted over 100 industry meetings and trade shows promoting environmentally sound agriculture, with over 3000 agribusiness professionals participating. In addition, there were nearly 200 environmental educational programs sponsored by agribusiness. During the year, roughly 200 companies produced literature promoting the use of BMPs and environmentally sound production. In addition, 90 environmental products and equipment were marketed for use in agricultural pollution control. Approximately 12,000 individuals were trained and recertified as registered landscape professionals and pesticide applicators. These trained professionals working with local producers implemented pesticide BMPs such as integrated pest management, scouting and biological control methods on over one million acres resulting in a reduction of pesticide use of over

100,000 pounds compared to conventional practices. More than 1500 publications, reports and interactions were generated. Jointly more than 200 multiagency educational programs have been delivered. One hundred thirty seven multiagency coalitions were initiated and more than 190 collaborative projects implemented.

Collectively, the agriculture and environmental programs resulted in an estimated 35 million dollars in direct benefits to customers and 85 million dollars to North Carolina citizens through advertment of negative environmental impacts.

SUCCESS STORIES
EXAMPLE SUCCESS STORIES

Success Story 1. "Forty-six Gaston, Lincoln, Catawba, and Cleveland County dairy producers have completed waste operator training and 100% of the producers in Lincoln and Catawba have completed their certified nutrient management plans with the remainder nearly complete. Six farms installed cow mattresses to reduce the solids going to waste storage ponds. Three dairies along Long Creek have cooperated in a project to improve water quality in the creek by adopting such practices as excluding livestock from streams, and constructing environmentally sound heavy use areas and stream crossings. Results of stream testing since 1993 indicate a 77% reduction in phosphorous levels with current levels at the lowest value the analysis method can accurately measure."

Success Story 2. "A significant need existed among the Fraser fir growers in Jackson and Swain counties to decrease their application rates of phosphorous due to high levels of P205 in the soil. Traditionally growers have applied Diammonium phosphate(18-46-0) year after year as a source of nitrogen and phosphorous for their trees without soil sampling throughout the rotation. Education efforts were made in meetings, newsletters and one on one visits to take soil and tissue samples for proper nutrient management on their farms. As a result over 27,200 lbs of P205 was reduced in soil application saving the participating growers .75 cents per bag using 34-0-0 as opposed to 18-46-0. Their trees are healthier with better vigor, color, density and uniformity increasing their grading standard and thus their sale price. In addition any potential environment damage due to the excess of P205 was eliminated."

Success Story 3. "One hundred landscape maintenance personnel from 6 counties learned integrated pest management techniques at the Pitt County Trufgrass Workshop. Insect, disease, and weed management. Those attending also learn how to operate mowers and string trimmers safely. Participants were evaluated to determine those in the industry using soil testing, IPM, slow release fertilizers, and certifications. One participant said, "this was a very informative meeting....ranks at the top as far as effectiveness...best I have been to in years."

Success Story 4. "A Lincoln County liner nursery experienced two especially challenging pest problems (fungus gnats and broad mites) that posed a significant threat to their profitability. A combined effort of the local agent, Plant Disease and Insect Clinic, and the entomology specialist at N.C. State led to the accurate identification of these problems and appropriate control recommendations. The nurseryman instituted control measures which made these problems more manageable and reduced the level of economic loss. It is estimated that by using the control recommendations for broad mites, the nurseryman was able to achieve $10,000 in sales over what he would have realized had the recommendations not been followed. The

knowledge he has gained this year will lead to reduced losses from these pests in the future."

Success Story 5. "Farmers, agribusinesses, and the Feed Grains Advisory Committee indicated that a New Technology Workshop was needed in order to understand benefits and opportunities of planting genetically engineered crops. A Biotechnology workshop was held which specifically dealt with how to boost efficiency and increase profits by using new technology, determining the value of new technology, safety of biotechnology, and moving biotechnology from the laboratory to the marketplace. As a result, 700 producers used genetically engineered cotton and soybeans as part of their IPM program to reduce pesticide use, protect the environment, and as a strategy to reduce hard to control weeds and insects on over 40 percent of Johnston County's acreage. The high yielding, genetically engineered varieties reduced production costs 10 percent and increased profitability $1.3 million. One agribusiness has begun implementing a precision farming program and hired an additional full time employee".

Success Story 6. "Eleven hundred 4th grade students and teachers, gained an appreciation of the importance of agriculture in the two Ag. Awareness Field Day held in 1997. A change in the scheduling of the event in the school year necessitated holding the event twice in 1997. Participants received workbooks with information and worksheets a week prior to the event. At the event students attended eight 15 min. sessions dealing with various agricultural topics. An essay contest on "Why Agric. is Important" was also held with the event. 18 winners received $50 savings bonds. The essay contest provided $900.00 in prizes to the students. Activities and program materials of this nature generally cost about $10.00 per student at petting farms. The total direct value to our school system for this program in 1997 comes to $11,400.00. Considering over 4000 students have participated in the past 8 years, this represents a $40,000.00 savings to our schools since it's inception."

Success Story 7. "The North Carolina Cooperative Extension Service taught over 800 school age youth and teachers in Vance and Warren Counties about agriculture and the environment. Participants learned the relationship between agricultural practices and water quality as well as the impact that they have on water quality and the environment in their daily life. Educational efforts were also made with 5 County officials and 150 non-farm public about policies and information about benefits of waste management. These efforts were accomplished by environmental field days, field trips, the classroom and at meetings. According to surveys received at meetings, 94 percent indicated that they learned new concepts or gained a better understanding about the waste regulations or waste management. 88 percent said that they would be able to apply the information learned."

OBJECTIVES, PERFORMANCE GOALS, AND INDICATORS

OBJECTIVE 1

To develop, transfer, and promote the adoption of efficient and sustainable agricultural, forestry, and other resource conservation policies, programs, technologies, and practices that ensure ecosystems achieve a sustainable balance of agricultural activities and biodiversity.

PERFORMANCE GOAL 1

To annually increase the research and knowledge-base available from CSREES partners and cooperators on environmental sciences and agriculture, including conserving, maintaining, and protecting ecosystem integrity and biodiversity.

INDICATOR 1

In the Plan, describe significant research underway or proposed on environmental sciences and related topics. In the Report, describe the most significant research completed during the report year in this area and its impact.

DATA COLLECTION METHODOLOGY

PERFORMANCE GOAL 2

To annually increase agricultural producer awareness, understanding, and information regarding the adoption of agricultural production practices that sustain and/or protect ecosystem integrity and biodiversity in which CSREES partners and cooperators play an active research, education, and extension role.

INDICATOR 1

The total number of persons completing non-formal education program on sustaining and protecting ecosystem biodiversity while improving the productivity of the U.S. agricultural production system, the total number of these persons who plan to adopt one or more recommended practices, and the total number of these persons who actually adopt one or more recommended practices within six months after completing one or more of these programs.

Year	# of persons completing programs		# who plan to adopt practices		# who actual adopt practi	
Baseline	200000		0		50000	
	Target	Actual	Target	Actual	Target	Ac
1998	30000	61785	0	0	10000	24893
1999	30000	0	0	0	10000	
2000	30000	0	0	0	10000	

2001	30000	0	0	0	10000

DATA COLLECTION METHODOLOGY

PERFORMANCE GOAL 3
To strengthen the capacity of higher education institutions to develop future scientists, professionals, and leaders in environmental sciences and related disciplines who will more effectively contribute to the development of agricultural production practices that sustain and/or protect ecosystems and bring into greater balance agricultural production activities and biodiversity needs of the surrounding ecosystem.

INDICATOR 1
The total number of students enrolled in formal courses in environmental sciences, and the number that utilize modern educational strategies, distance learning technologies, and educational or internship experiences in real world learning environments.

Year	# of students in formal courses	
Baseline	3119	
	Target	Actual
1998	3150	0
1999	3181	0
2000	3212	0
2001	3244	0

DATA COLLECTION METHODOLOGY

OBJECTIVE 2
To develop, transfer, and promote adoption of efficient and sustainable agricultural, forestry, and other resource policies, programs, technologies, and practices that protect, sustain, and enhance water, soil and air resources.

PERFORMANCE GOAL 1
To annually increase producer adoption of agricultural production practices that conserve and/or protect surface and groundwater supplies on or adjacent to agricultural production sites or land uses.

INDICATOR 1
The total number of persons completing non-formal education programs on sustaining and/or protecting the quantity and quality of surface water and ground water supplies, the total number of these persons who plan to adopt one or more water management practices, and the total number of these persons who actually adopt one or more water management practices within six months after completing one or more of these programs.

Year	# of persons	# who plan to adopt	# who actual

	completing programs		practices		adopt practice	
Baseline	200000		0		50000	
	Target	Actual	Target	Actual	Target	Actu
1998	23000	41534	0	0	7500	18189
1999	23000	0	0	0	7500	
2000	23000	0	0	0	7500	
2001	23000	0	0	0	7500	

DATA COLLECTION METHODOLOGY

PERFORMANCE GOAL 2
To annually increase producer adoption of agricultural production "best practices" that conserve, protect, and/or enhance the soil resources on or adjacent to agricultural production sites or land uses.

INDICATOR 1
The total number of persons completing non-formal education programs on conserving, sustaining, and/or protecting soil resources, the total number of these persons who plan to adopt one or more soil conservation practices, and the total number of these persons who actually adopt one or more soil conservation practices within six months of completing one or more non-formal education programs.

Year	# of persons completing programs		# who plan to adopt practices		# who actually adopt practice	
Baseline	200000		0		50000	
	Target	Actual	Target	Actual	Target	Actu
1998	21500	58198	0	0	5000	14965
1999	21500	0	0	0	5000	
2000	21500	0	0	0	5000	
2001	21500	0	0	0	5000	

DATA COLLECTION METHODOLOGY

PERFORMANCE GOAL 3
To annually increase the research and knowledge-base available from CSREES partners and cooperators on agricultural practices that protect, sustain, and enhance water, soil, and air resources.

INDICATOR 1
In the Plan, describe significant research underway or proposed on agricultural technologies and practices that protect, sustain, and/or enhance water, soil, and air resources. In the Report, describe the most significant research completed during the report year in this area and its impact.

DATA COLLECTION METHODOLOGY

OBJECTIVE 3
To improve decisionmaking on public policies related to agriculture and the environment.

PERFORMANCE GOAL 1
To annually increase the research and knowledge-base available from CSREES partners and cooperators on public policy issues affecting agricultural production, the environment, and ecosystem integrity and biodiversity.

INDICATOR 1
In the Plan, describe significant research underway or proposed on public policy issues affecting agricultural production, the environment, and ecosystem integrity and biodiversity. In the Report, describe the most significant research completed during the report year in this area and its impact.

DATA COLLECTION METHODOLOGY

PERFORMANCE GOAL 2
To annually increase the effectiveness of constituent and citizen participation on public policy issues affecting agricultural production, the environment, and ecosystem integrity and biodiversity.

INDICATOR 1
The total number of persons completing non-formal education programs on public policy issues affecting agricultural production and ecosystem integrity and biodiversity, the total number of these persons who plan to become actively involved in one or more public policy issues, and the total number of these persons who actually become actively involved in one or more public policy issues within six months after completing one or more of these programs.

Year	# of persons completing programs		# who plan to become involved		# who actuall become involv	
Baseline	2000000		0		500000	
	Target	Actual	Target	Actual	Target	Act
1998	50000	54824	0	0	2000	3642
1999	50000	0	0	0	2000	
2000	50000	0	0	0	2000	
2001	50000	0	0	0	2000	

DATA COLLECTION METHODOLOGY

OTHER STATE SPECIFIC OBJECTIVES AND INDICATORS

PROGRAM COST

Extension

Year	Federal	State	Local	Other
1998	2850000	6550000	1500000	0
1999	2850000	6600000	1575000	0
2000	2850000	6650000	1600000	0
2001	2850000	6700000	1600000	0

Research

Year	Federal	State	Local	Other
1998	3750000	6000000	0	1750000
1999	4000000	6250000	0	1850000
2000	4250000	6500000	0	2850000
2001	4550000	6750000	0	2750000

Higher Education

Year	Federal	State	Local	Other
1998	0	625000	0	0
1999	0	645000	0	0
2000	0	655000	0	0
2001	0	675000	0	0

FTE COMMITMENT

Extension FTEs

Year	Professional			Paraprofessional		
	1862	1890	Other	1862	1890	Other
1998	110.0	10.0	0.0	25.0	2.0	0.0
1999	110.0	10.0	0.0	25.0	2.0	0.0
2000	110.0	10.0	0.0	25.0	2.0	0.0
2001	110.0	10.0	0.0	25.0	2.0	0.0

Research SYs Only

Year	Scientist Years					
	1862	1890	Other	1862	1890	Other
1998	40.0	5.0	0.0	0.0	0.0	0.0
1999	40.0	5.0	0.0	0.0	0.0	0.0
2000	40.0	5.0	0.0	0.0	0.0	0.0
2001	40.0	5.0	0.0	0.0	0.0	0.0

Higher Education FTEs

Year	Professional			Paraprofessional		
	1862	1890	Other	1862	1890	Other
1998	7.5	1.0	0.0	0.0	0.0	0.0
1999	7.5	1.0	0.0	0.0	0.0	0.0
2000	7.5	1.0	0.0	0.0	0.0	0.0
2001	7.5	1.0	0.0	0.0	0.0	0.0

VOLUNTEER PARTICIPATION

Extension

Year	# of Volunteers
1998	7995
1999	0
2000	0
2001	0

Research

Year	# of Volunteers
1998	0
1999	0
2000	0
2001	0

Higher Education

Year	# of Volunteers

1998	0
1999	0
2000	0
2001	0

ADDITIONAL COMMENTS

PROGRAM CONTACTS

David B Beasley (Admin, Prog)
Professor and Head
Dept. Biological & Agricultural Eng.
100 D.S. Weaver Labs
Box 7625
Raleigh, NC 27695-7625
Voice phone: 919-515-6700
Fax phone : 919-515-6772
Electronic mail: beasley@eos.ncsu.edu

Robert O Evans (Prog, Data)
Assistant Professor & Dept Ext. Leader
Dept. Biological & Agricultural Eng.
200 D.S. Weaver Lab
Box 7625
Raleigh, NC 27695-7625
Voice phone: 919-515-6788
Fax phone : 919-515-6772
Electronic mail: evans@eos.ncsu.edu

Wilma S Hammett (Prog)
Extension Housing Specialist
Dept. Family & Consumer Sciences
210 Ricks Hall
Box 7605
Raleigh, NC 27695-7605
Voice phone: 919-515-9153
Fax phone : 919-515-3483
Electronic mail: whammett@amaroq.ces.ncsu.edu

David A Crouse (Prog)
Assistant Professor & Ext. Specialist
Soil Science
3403 Williams Hall
Box 7619
Raleigh, NC, 27695-7619
Voice phone: 919-515-7302
Fax phone : 919-515-7494
Electronic mail: david_crouse@ncsu.edu

Leon E Danielson (Prog)
Professor and Extension Specialist
Agri. & Resource Economics
332D Nelson Hall
Box 8109
Raleigh, NC, 27695-8109
Voice phone: 919-515-4534

Fax phone : 919-515-6268
Electronic mail: leon_danielson@ncsu.edu

William E Gardner (Prog)
Extension Specialist
Forestry Department
3028-G Biltmore Hall
Box 8003
Raleigh, NC, 27695-8003
Voice phone: 919-515-5577
Fax phone : 919-515-6883
Electronic mail: gardner@cfr.cfr.ncsu.edu

Larry G Jahn (Prog)
Dept Extension Leader
Wood and Paper Science
3036-D Biltmore Hall
Box 8003
Raleigh, NC, 27695-8003
Voice phone: 919-515-5579
Fax phone : 919-515-8739
Electronic mail: jahn@cfr.cfr.ncsu.edu

Robert D Williamson (Prog)
Extension Specialist
Forestry Dept, N.C. A&T
C.H. Moore Hall
A16 Box 21928
Greensboro, NC, 27420-1928
Voice phone: 910-334-7956
Fax phone : 910-334-7077
Electronic mail: robertw@ncat.edu

Robert L Mikkelsen (Prog)
Associate Professor
Soil Science Dept
Box 7619
Raleigh, NC, 27695-7619
Voice phone: 919-515-2388
Fax phone : 919-515-2167
Electronic mail: robert_mikkelsen@ncsu.edu

NORTH CAROLINA 1998 ANNUAL REPORT:
GOAL 5 - TO ENHANCE ECONOMIC OPPORTUNITIES AND THE QUALITY OF LIFE AMONG FAMILIES AND COMMUNITIES.

GOAL ACCOMPLISHMENT NARRATIVE
NARRATIVE STATEMENT:

Performance Goal 1:
In response to Performance Goal 1 to annually increase the research and knowledge base available from CSREES partners and cooperators on the economic well-being of communities and their citizens, there are two primary indicators:
1) referenced journal articles and 2) referenced and peer-reviewed materials will continually be produced consistent with designing and implementing theoretically grounded and research based programs to achieve Goal 5.

Performance Goal 2:
In response to Performance Goal 2 to increase economic opportunities in communities through economic development programs in which CSREES partners and cooperators play an active research education and extension role, Indicators 1 and 2 have reports. For Indicator 1: a total of 12,392 of the targeted 14,750 (84%) public officials and community leaders completed programs. Of those completing programs, 1,668 of the targeted 3,000 (56%) actually adopted one or more of the recommended practices to attract new businesses or help expand existing businesses within six months of program completion. For Indicator 2: 411 of the targeted 425 (97%) of new businesses started from economic development programs.

Performance Goal 3:
In response to Performance Goal 3 to annually improve the financial status of families through financial management education programs, Indicator 1 was reported. For Indicator 1: 55,974 of the targeted 38,000 (147%) persons completed non-formal financial management education programs. Of those, 27,337 of the targeted 27,500 (99%) actually adopted one or more of the recommended practices to decrease consumer credit debt or increase savings within six months of the programs.

Performance Goal 4:
In response to Performance Goal 4, Objective 2, to annually increase the incidence of caring communities resulting from non-formal education, Indicators 1 and 2 were reported. For indicator 1: 31,438 of the targeted 20,200 (156%) persons completed programs on to community decision making and leadership development. Of these, 15,996 of the targeted 8,500 (188%) actually became actively involved in one or more community projects within six months of the program. For indicator 2: 17,598 of the targeted 13,000 (135%) dependent care providers completed programs.

Of these, 12,248 of the targeted 7,600 (161%) actually adopted one or more new principles, behaviors, or practices within six months.

Performance Goal 2:
For Performance Goal 2 to annually increase the incidence of strong families resulting from non-formal education programs, Indicators 1 and 2 had reports. For Indicator 1: 35,871 of the targeted 29,500

(121%) completed non-formal education programs on parenting. Of these, 20,552 of the targeted 13,300 (155%) actually adopted one or more parenting principles, behaviors, or practices within six months of the program. For Indicator 2: 123,495 of the targeted 77,000 (160%) persons completed non-formal education programs on youth development. Of these, 122,850 of the targeted 72,900 (169%) actually adopted one or more youth development principles, behaviors, or practices within six months.

State Specific Objectives / Indicators:
Impacts reported for Performance Goal 2 were compiled from State Major Program 6; Community and Economic Development, Objectives 1, 2, 3, and 4 and State Major Program 8, Family and Consumer Economics, Objective 5. Impacts reported for Performance Goal 3 were compiled from State Major Program 6; Community and Economic Development, Objectives 2, 3, and 4. Impacts reported in Performance Goal 4 were compiled from State Major Program 5; Child Care, Objectives 1 and 2; State Major Program 6, Community and Economic Development, Objectives 2 and 4; and State Major Program 10, Food and Forest Products Manufacturing, Objectives 1 and 3. Impacts reported for Performance Goal 2 were compiled from State Major Program 19, Resilient Youth, Families and Communities, Objectives 1 and 2; and State Major Program 20, Youth Development, Objectives 1, 2, 3, and 4.

OBJECTIVES, PERFORMANCE GOALS, AND INDICATORS

OBJECTIVE 1

To increase the capacity of communities and families to enhance their own economic well-being.

PERFORMANCE GOAL 1

To annually increase the research and knowledge-base available from CSREES partners and cooperators on the economic well-being of communities and their citizens.

INDICATOR 1

In the Plan, describe significant research underway or proposed on economic well-being of consumers, families, and communities. In the Report, describe the most significant research completed during the report year in this area and its impact.

1998 ACTUAL RESULT(S)

DATA COLLECTION METHODOLOGY

PERFORMANCE GOAL 2

To annually increase economic opportunities in communities through economic development programs in which CSREES partners and cooperators play an active research, education, and extension role.

INDICATOR 1

The total number of public officials and community leaders completing non-formal education programs on economic or enterprise development, the total number of these public officials and community leaders who plan to adopt one or more recommended practices to attract new businesses or help expand existing businesses, and the total number of these public officials and community leaders who actually adopt one or more recommended practices to attract new businesses or help expand

existing businesses within six month after completing one or more of these programs.

Year	# of officials completing programs		# who plan to adopt practices		# who actually adopt practice	
Baseline	14695		0		2941	
	Target	Actual	Target	Actual	Target	Actu
1998	14750	12392	0	0	3000	1668
1999	15000	0	0	0	3000	
2000	15000	0	0	0	3100	
2001	15000	0	0	0	3100	

DATA COLLECTION METHODOLOGY

INDICATOR 2
The number of new businesses started resulting from economic development programs developed in collaboration with CSREES partners and cooperators.

Year	# of new businesses started	
Baseline	423	
	Target	Actual
1998	425	411
1999	430	0
2000	432	0
2001	434	0

DATA COLLECTION METHODOLOGY

INDICATOR 3
The number of existing businesses maintaining or expanding operations from economic development programs developed in collaboration with CSREES partners and cooperators.

Year	# of businesses maintaining, etc.	
Baseline	0	
	Target	Actual
1998	0	0
1999	0	0
2000	0	0

2001	0	0

DATA COLLECTION METHODOLOGY

INDICATOR 4
The number of jobs created by the formation of new businesses and expansion of existing businesses resulting from economic development programs developed in collaboration with CSREES partners and cooperators.

Year	# of jobs created by businesses	
Baseline	0	
	Target	Actual
1998	0	0
1999	0	0
2000	0	0
2001	0	0

DATA COLLECTION METHODOLOGY

PERFORMANCE GOAL 3
To annually improve the financial status of families through financial management education programs implemented in which CSREES partners and cooperators play an active research, education, or extension role.

INDICATOR 1
The number of persons completing non-formal financial management education programs, the number of these persons who plan to adopt one or more recommended practices to decrease consumer credit debt or increase savings, and the total number of these persons who actually adopt one or more recommended practices to decrease consumer credit debt or increase savings within six months after completing one or more of these programs.

Year	# of persons completing programs		# who plan to adopt practices		# who actually adopt practice	
Baseline	37227		0		27136	
	Target	Actual	Target	Actual	Target	Actu
1998	38000	55974	0	0	27500	27,337
1999	38500	0	0	0	27700	
2000	38500	0	0	0	27900	
2001	39000	0	0	0	28200	

DATA COLLECTION METHODOLOGY

PERFORMANCE GOAL 4
To strengthen the capacity of higher education institutions to develop future scientists, professionals, and leaders in family, consumer, and community economics who will more effectively contribute to greater understanding of economic issues.

INDICATOR 1
The total number of students enrolled in formal courses in family, consumer, and community economics that utilize modern educational strategies, distance learning technologies, and educational internship experiences in real world learning environments.

Year	# of students in formal courses	
Baseline	3087	
	Target	Actual
1998	3117	3117
1999	3148	0
2000	3179	0
2001	3211	0

DATA COLLECTION METHODOLOGY

OBJECTIVE 2
To increase the capacity of communities, families, and individuals to improve their own quality of life.

PERFORMANCE GOAL 1
To annually increase the incidence of caring communities resulting from non-formal education programs in which CSREES partners and cooperators, play an active research, education, or extension role.

INDICATOR 1
The total number of persons completing non-formal education programs on community decisionmaking and leadership development, the total number of these persons who plan to become actively involved in one or more community projects, and the total number of these persons who actually become actively involved in one or more community projects within six months after completing one or more of these programs.

Year	# of persons completing programs		# who plan to become involved		# who actually become involve	
Baseline	20125		0		8281	
	Target	Actual	Target	Actual	Target	Actu
1998	20200	31438	0	0	8500	15996
1999	20200	0	0	0	8600	

2000	20200	0	0	0	8700	
2001	20200	0	0	0	8800	

DATA COLLECTION METHODOLOGY

INDICATOR 2
The total number of dependent care providers completing non-formal education programs, the total number of these dependent care providers who plan to adopt one or more new principles, behaviors, or practices, and the total number of these dependent care providers who actually adopt one or more new principles, behaviors, or practices within six months after completing one or more of these programs.

Year	# of care providers completing programs	# who plan to adopt new principles, etc		# who actually adopt principle	
Baseline	12631	0		7506	
	Target	Actual	Target	Actual	Target	Actu
1998	13000	17598	0	0	7600	12248
1999	13200	0	0	0	7650	
2000	13300	0	0	0	7650	
2001	13400	0	0	0	7700	

DATA COLLECTION METHODOLOGY

PERFORMANCE GOAL 2
To annually increase the incidence of strong families resulting from non-formal education programs in which CSREES partners and cooperators play an active research, education, or extension role.

INDICATOR 1
The total number of persons completing non-formal education programs on parenting, the total number of these persons who plan to adopt one or more parenting principles, behaviors, or practices, and the total number of these persons who actually adopt one or more parenting principles, behaviors, or practices within six months after completing one or more of these programs.

Year	# of persons completing programs	# who plan to adopt principles, etc.		# who actuall adopt principl	
Baseline	29411	0		13224	
	Target	Actual	Target	Actual	Target	Act
1998	29500	35871	0	0	13300	20552
1999	29700	0	0	0	13400	
2000	29700	0	0	0	13450	

2001	29800	0	0	0	13500	

DATA COLLECTION METHODOLOGY

INDICATOR 2
The total number of persons completing non-formal education programs on youth development, the number of these persons who plan to adopt one or more youth development principles, behaviors, or practices, and the total number of these persons who actually adopt one or more youth development principles, behaviors, or practices within six months after completing one or more of these programs.

Year	# of persons completing programs	# who plan to adopt principles, etc.	# who actually adopt principle
Baseline	76917	0	72814

	Target	Actual	Target	Actual	Target	Actu
1998	77000	123495	0	0	72900	122,85(
1999	77000	0	0	0	72950	
2000	78000	0	0	0	73000	
2001	78000	0	0	0	73000	

DATA COLLECTION METHODOLOGY

PERFORMANCE GOAL 3
To annually increase the research and knowledge-base available from CSREES partners and cooperators on increasing the capacity of communities, families, and individuals to improve their own quality of life.

INDICATOR 1
In the Plan, describe significant research underway or proposed that will result in increasing the capacity of communities, families, and individuals to improve their own quality of life. In the Report, describe the most significant research completed during the report year and its impact.

DATA COLLECTION METHODOLOGY

OTHER STATE SPECIFIC OBJECTIVES AND INDICATORS

PROGRAM COST

Extension

Year	Federal	State	Local	Other
1998	806200	1973500	941700	0
1999	816000	2017000	960700	50000

2000	829000	2054000	1000000	70000
2001	836000	2063000	1000000	100000

Research

Year	Federal	State	Local	Other
1998	559000	1585000	0	227000
1999	550000	1500000	0	225000
2000	550000	1500000	0	225000
2001	550000	1500000	0	225000

Higher Education

Year	Federal	State	Local	Other
1998	0	875000	0	0
1999	0	900000	0	0
2000	0	918000	0	0
2001	0	945000	0	0

FTE COMMITMENT

Extension FTEs

Year	Professional			Paraprofessional		
	1862	1890	Other	1862	1890	Other
1998	56.6	1.6	1.0	5.0	1.5	1.0
1999	56.6	1.6	2.0	6.0	1.5	1.0
2000	57.6	1.6	2.0	7.0	1.5	2.0
2001	57.6	1.6	3.0	8.0	1.5	2.0

Research SYs Only

Year	Scientist Years					
	1862	1890	Other	1862	1890	Other
1998	8.4	0.0	0.0	0.0	0.0	0.0
1999	8.0	0.0	0.0	0.0	0.0	0.0

2000	8.0	0.0	0.0	0.0	0.0	0.0
2001	8.0	0.0	0.0	0.0	0.0	0.0

Higher Education FTEs

Year	Professional			Paraprofessional		
	1862	1890	Other	1862	1890	Other
1998	10.5	0.0	0.0	0.0	0.0	0.0
1999	10.5	0.0	0.0	0.0	0.0	0.0
2000	10.5	0.0	0.0	0.0	0.0	0.0
2001	10.5	0.0	0.0	0.0	0.0	0.0

VOLUNTEER PARTICIPATION

Extension

Year	# of Volunteers
1998	56883
1999	0
2000	0
2001	0

Research

Year	# of Volunteers
1998	0
1999	0
2000	0
2001	0

Higher Education

Year	# of Volunteers
1998	0
1999	0
2000	0
2001	0

ADDITIONAL COMMENTS

PROGRAM CONTACTS

Charles L Moore
Department Extension Leader
Agricultural & Resource Economics
232B Nelson Hall
Box 8109
NCSU, Raleigh, NC 27695
Voice phone: 919-515-2607
Fax phone : 919-515-6268
Electronic mail: chuck_moore@ncsu.edu

NORTH CAROLINA 1998 ANNUAL REPORT:
EFNEP - SMITH-LEVER 3D FUNDED ITEM

GOAL ACCOMPLISHMENT NARRATIVE
A. OBJECTIVES

Three thousand seven hundred and fifty (3750) EFNEP families will acquire the knowledge, skills, attitudes and changed behavior for nutritionally sound diets and to contribute to their personal development.

Five thousand (5,000) 4-H EFNEP Youth will acquire the knowledge, skills, and changed behavior necessary for nutritionally sound diets and to contribute to their personal development.

The EFNEP state program will increase interagency cooperation.

Pregnant and parenting teenagers will increase knowldege of maternal/infant nutrition, resulting in improved maternal and infant health.

To increase numbers of WIC mothers establishing lactation (beyond two weeks post-partum). (baseline - 75%) and duration of breastfeeding past two months post-partum: (baseline - 17%).

B. NON-EXTENSION RESOURCES

The requirement of a similar county financial match for EFNEP paraprofessional positions as was required for other county Extension employees was implemented. North Carolina county Extension programs were given two years to plan and budget for these matching funds. These county match requirements became effective in July, 1997, when filling any vacant paraprofessional position. This ensures a gradual phase-in of county support for EFNEP paraprofessional positions.

D. OTHER INDICATORS AND ACCOMPLISHMENTS

INTERAGENCY COOPERATION

Evidence of increased agency cooperation is clear. The numbers and percent of enrollments of WIC participants in EFNEP continued to rise in FY: 97. Percent enrollment in Food Stamp programs remained above 50%. Enrollment of WIC participants increased considerably because of ES/WIC grant-funded projects, such as the breastfeeding support program in ten counties, the pregnant teen program with its expansion throughout the state, and special group teaching at a number of WIC sites.

EFNEP staff increased their teaching efforts with groups, largely with preformed groups referred from other agencies. Percent of EFNEP participants being taught in groups reached 78% in FY: 97. These numbers excluded 1518 breastfeeding support program participants in FY: 97 who were all taught on an individual basis.

DIETARY IMPROVEMENT

Of 3167 participants who graduated from EFNEP during FY:97, 1900 (60%) improved their diets to include at least one serving of foods from each food group (40%) increased from program entry. Three hundred and forty-nine participants (13%) achieved recommended food servings in all food groups, an increase of 11% from program entry.

IN-HOME BREASTFEEDING SUPPORT PROGRAM.

In September of FY:96 ES/WIC funds ended. As a result, some breastfeeding project counties were successful at identifying funding sources resulting in sustainability of the program. Still other new counties demonstrated interest and also identified funding sources. As of FY:97, two county breastfeeding projects are funded by the WIC program, two county projects are funded by a private philanthropic foundation, one is funded by the regional hospital, and four county projects are funded by Smart Start for a total of nine current projects (Note: grant proposals are currently being considered for three additional projects).

Results showed that numbers of WIC clients choosing to breastfeed had increased, and that a significantly greater number and percent were still breastfeeding at two weeks, six weeks and eight weeks post-partum when compared with baseline WIC records. These effects were independent of urban or rural status. Fifteen hundred eighteen (1518) breastfeeding mothers in 7 counties were enrolled in the In-Home Breastfeeding support Program during FY:97.

Also through ES/WIC funds North Carolina collaborated with the Children's Nutrition Research Center at Baylor College of Medicine, regional lactation professionals and the EFNEP and WIC progrms in Michigan to develop a comprehensive training curriculum appropriate for preparing high school graduates to be non-professional breastfeeding counselors. This curriculum (In-Home Breastfeeding Support Program) includes a detailed teaching guide and all required teaching materials (video, handout masters, transparencies, and slides). A companion notebook was developed to provide a management guide for replication of North Carolina's In Home Breastfeeding Support Program.

SUCCESS STORIES

Two counties teamed to do programming with migrants involved with Headstart. On-going training for staff and parents was done over a 3-month period. Staff training occurred during the day with parents attending workshops in the evening. Paraprofessionals worked with interpreters to translate EFNEP forms and handouts into Spanish.

One project targeted inner-city youth involving two public housing communities. It was successful in part due to the collaboration with community churches. The youth participated in the preparation of healthful meals with the support of a strong volunteer base evolving from the local churches. A grant has been submitted in conjunction with the local churches to secure continuation funding for 1998.

In one county, EFNEP has had good response from participants involved in a series conducted at a police sub-station site located in a public housing community. Graduates have been instrumental in recruiting others for subsequent groups within the community. One of the participants reported that she had come to recognize the link between a good breakfast and school performance. As a recently employed public assistance recipient, the single mother learned to prepare breakfast items the night before for effective time management.

Collaboration with the county public school system and the Migrant Farmers Association contributed to the success of a program in Montgomery County. Forty-seven percent (132) of the youth in the program were Hispanic, some of whom were non-English speaking. As a result of negotiations and comprehensive joint planning, the Montgomery County School System became a

major player in the program. The school system paid for eight teachers and translators to work with the program. Also, through the school system's Migrant Education fund, monetary assistance was provided to meet the specail needs of the Hispanic youth. The essence of community partnerships, which is to make the best match of resources to needs, was achieved.

Wayne County--The summer 4-H EFNEP program built upon a long-term relationship with the Goldsboro Housing Authority in order to provide nutrition project clubs to the young people residing in public housing. In coordination with Resident Council leadership, the process of galvanizing organizations in support of community driven initiatives was achieved. Adults from the community were trained to serve as volunteers to help coordinate and maintain the clubs. Teenagers were instrumental in designing nutrition training materials and kits that were delivered in the clubs to younger youth. The result of this collaborative effort is community capacity building, skill development and empowerment. The program provided a concrete way in which community members could impact the health of its youth.

Since it began in 1994, a special project working with pregnant teens has reached 211 adolescents. The average age of the mothers is 16 with a range of 10-19. Pre and post tests show an 86% increase in knowledge and attitude towrard behavior fostering positive pregnancy outcomes. Anaylsis of dietary recalls show an increase in nutritive value of foods consumed, an increase in dairy products and vegetable and fruit consumption. Of the 211 adolescents, 202 delivered babies with birth wieghts exceeding the 5.5 pound goal. One of the pregnant adolescents was placed on bed rest during ther seventh month of pregnancy. The paraprofessional visited the young woman weekly to provide encouragement and support. The baby was born at term and weighed five pounds, 12 1/2 counces. The physicians were amazed.

Another pregnant teen joined the program during her third month of pregnancy. The paraprofessional reported the following: "When I met her, her dietary habits were unhealthy. She was eating chips, sodas, candy and fats. She was having trouble with leg cramps, sleeping and vomiting. After working with her on a regular basis, her health improved. She is having less leg cramps, her vomiting has reduced and she is now learning the importance of eating fruits and vegetables and other nutritious foods to have healthy baby."

Another paraprofessional has worked with a home day care training program for individuals wishing to establish home day care businesses on a local air force base. Nutrition education through EFNEP is a required component of the course. Most of the students in the program are young mothers who qualify for EFNEP. The paraprofessional reports: "I teach the entire EFNEP program concentrating heavily on meal planning, the Food Guide Pyramid, the dietary requirements of young children, and how to follow a plan when food shopping. I have had over 40 graduates this year from the home day care program. Even the ones who never open a business say this is time well spent, because it helps them to feed thier families better with less money. There are currently 34 home day care businesses on Seymour Johnson Air Force Base. All of the operators have graduated from EFNEP. They all participate in the CACFP program. These graduates say they share the nutrition information they learned in EFNEP with the parents of the children they care for. They are not only improving their families basic nutrition but that of other families as well. Over the last four years I have graduated more than a hundred young mothers from the day care training program."

One paraprofessional with the adult EFNEP program reported that all of her individual participants were referrals from the breastfeeding support

program in her county. She finds these breastfeeding mothers to be motivated EFNEP participants.

Two hundred seventy brouchures were distributed at the quarterly commodity food pick-up in one county. Through this recruitment, and EFNEP group was started.

One Hispanic participant responded that she had learned a great deal from her EFNEP experience. During a food safety lesson, she commented to the paraprofessional that she had been purchasing large packages of meat and thawing out the whole package every time she was going to use some, and then refreezing the rest. The paraprofessional reported: "She quickly realized what she was doing was unsafe and she was grateful that I had showed her the correct way to package and store food for future use."

A paraprofessional enrolled a participant with very below standard housing. Over the months of her participation, in addition to providing EFNEP instruction, the paraprofessional provided referrals to organizations that could assist the participant with her housing concerns. The participant often needed assistance with the forms required by these organizations. As the months of her EFNEP participation progressed, renovations for the participant's home were approved. At graduation, the paraprofessional reported: "One of the most important things I learned from this episode is how much EFNEP paraprofessionals can help their clients. Often we are aware of programs and agencies that our clients are not and when we use this knowledge, we can make a difference in the lives of our clients, we make a difference in their children's lives as well."

A number of paraprofessionals have concentrated efforts with Hispanic clients. One paraprofessional shared a specific experience with the Migrant Headstart Program. "This year I was able to work with Hispanic families through the Migrant Headstart program. Headstart provided transportation and interpreters which eliminated two significant barriers. Forty families were enrolled and graduated as a result."

PROGRAM COST

Extension

Year	Federal	State	Local	Other
1998	2500000	0	0	0
1999	0	0	0	0
2000	0	0	0	0
2001	0	0	0	0

FTE COMMITMENT

Extension FTEs

Year	Professional			Paraprofessional		
	1862	1890	Other	1862	1890	Other

1998	11.0	0.0	0.0	79.0	0.0	0.0
1999	0.0	0.0	0.0	0.0	0.0	0.0
2000	0.0	0.0	0.0	0.0	0.0	0.0
2001	0.0	0.0	0.0	0.0	0.0	0.0

VOLUNTEER PARTICIPATION

Extension

Year	# of Volunteers
1998	2000
1999	0
2000	0
2001	0

ADDITIONAL COMMENTS

PROGRAM CONTACTS

Susan S Baker (Admin, Prog, Data)
EFNEP Coordinator
Box 7605--NCSU
Raleigh, NC 27695-7605
Voice phone: 919 515-9157
Fax phone : 919 515-3483
Electronic mail: Susan_Baker@ncsu.edu

Ann Y Frazier
Extension 4-H Specialist, EFNEP
Box 7606--NCSU
Raleigh, NC 27695-7606
Voice phone: 919 515-8478
Electronic mail: afrazier@amaroq.ces.ncsu.edu

Lisa Guion
Extension Assoc, 4-H EFNEP
Box 7606--NCSU
Raleigh, NC 27695-7606
Voice phone: 919 515-8261
Electronic mail: lguion@amaroq.ces.ncsu.edu

Mock Judy
Interim Assoc Dir & Dept Head, F&C Sci
Box 7605--NCSU
Raleigh, NC 27695-7605
Voice phone: 919 515-9152
Electronic mail: jmock@amaroq.ces.ncsu.edu

NORTH CAROLINA 1998 ANNUAL REPORT:
WATER QUALITY - SMITH-LEVER 3D FUNDED ITEM

GOAL ACCOMPLISHMENT NARRATIVE

The North Carolina Cooperative Extension System conducted targeted education programs to address the following water quality issues: (1) animal waste; (2) nutrient management; (3) pesticide management; (4) septic systems; (5) drinking water safety; (6) urban stormwater; (7) stream restoration; and (8) watershed management. More than 9,000 animal waste management system operators have been trained and certified through CES workshops and continuing education programs. A comprehensive nutrient management training and demonstration program is underway for over 5,000 fertilizer applicators in the Neuse River Basin and will be expanded to other Nutrient Sensitive Waters of the state. CES faculty trained over 8,000 pesticide applicators on safe and efficient practices as part of the state certification process. The Farm*A*Syst and Home*A*Syst environmental assessment worksheets are being used to educate homeowners about proper septic system and drinking water well protection measures. In addition, a national training center for land-based technologies is being used to train septic system operators throughout the state. A new urban stormwater education program was initieated to assist 15 communities in the Neuse River Basin with mandatory stormwater management programs. Stream restoration education efforts included 3 workshops and 12 demonstration projects to restore and protect more than 4 miles of degraded streams using natural channel design techniques. More than 5,000 people participated in 4 conferences and 25 educational meetings in the state's 17 river basins to learn how to better manage their watersheds for sustainable environmental protection.

OBJECTIVES, PERFORMANCE GOALS, AND INDICATORS

OBJECTIVE 1

To Protect the quality and quantity of the nation's ground water through focused outreach educational programs.

PERFORMANCE GOAL 1

Through a nationwide educational program, ensure that by the year 2001, 90 percent of farmers/ranchers and community-based water systems have information to facilitate the adoption of best management practices (BMPs) for the protection of water resources.

INDICATOR 1

The total number of farmers/ranchers completing educational programs on the use of BMPs to protect or improve the quality of water resources on an annual basis. (SPECIAL NOTE: Select all BMPs on which program is focused. BASELINE refers to the number of farmers/ranchers in the target area) [CONTINUED IN INDICATOR 2]

Year	# trained in Hygiene BMPs		# in Animal Waste Management BMPs		# in Nutrient Management BMP	
Baseline	5000		5000		5000	
	Target	Actual	Target	Actual	Target	Actu
1998	1250	1500	1250	2000	1250	1500
1999	1250	0	1250	0	1250	

2000	1250	0	1250	0	1250	
2001	1250	0	1250	0	1250	

DATA COLLECTION METHODOLOGY

INDICATOR 2
The total number of farmers/ranchers completing educational programs on the use of BMPs to protect or improve the quality of water resources on an annual basis. (SPECIAL NOTE: Select all BMPs on which program is focused. BASELINE refers to the total number of farmers/ranchers in the target area) [CONTINUED FROM INDICATOR 1]

Year	# in Pesticide Management BMPs		# in Irrigation BMPs		# in other Wate Quality BMPs	
Baseline	5000		400		100	
	Target	Actual	Target	Actual	Target	Actu
1998	500	1000	100	200	20	100
1999	500	0	100	0	20	
2000	500	0	100	0	20	
2001	500	0	100	0	20	

DATA COLLECTION METHODOLOGY

INDICATOR 3
The total number of community-based water systems in which staff have completed training on the use of BMPs to protect or improve the quality of the water resource. (SPECIAL NOTE: Select all BMPs on which program is focused. BASELINE refers to the total number of community-based water systems in the target area) [CONTINUED IN INDICATOR 4]

Year	# trained in Hygiene BMPs		# in Animal Waste Management BMPs		# in Nutrient Management BMP	
Baseline	100		100		100	
	Target	Actual	Target	Actual	Target	Actu
1998	10	10	10	10	10	10
1999	10	0	10	0	10	
2000	10	0	10	0	10	
2001	10	0	10	0	10	

DATA COLLECTION METHODOLOGY

INDICATOR 4
The total number of community-based water systems in

which staff have completed training on the use of BMPs to protect or improve the quality of the water resource. (SPECIAL NOTE: Select all BMPs on which program is focused. BASELINE refers to the total number of community-based water systems in the target area) [CONTINUED FROM INDICATOR 3]

Year	# in Pesticide Management BMPs		# in Irrigation BMPs		# in other Wate Quality BMPs	
Baseline	100		100		100	
	Target	Actual	Target	Actual	Target	Actu
1998	10	10	10	10	10	10
1999	10	0	10	0	10	
2000	10	0	10	0	10	
2001	10	0	10	0	10	

DATA COLLECTION METHODOLOGY

INDICATOR 5
The total number of acres on which BMPs have been applied on an annual basis. (SPECIAL NOTE: Select all BMPs on which program is focused. BASELINE refers to the total number of acres in the target area) [CONTINUED IN INDICATOR 6]

Year	# acres of Animal Waste Mgt. BMPs		# acres Nutrient Management BMPs		# acres Pestici Management BMP	
Baseline	80000		500000		500000	
	Target	Actual	Target	Actual	Target	Actu
1998	20000	25000	100000	25000	10000	10000
1999	20000	0	100000	0	10000	
2000	20000	0	100000	0	10000	
2001	20000	0	100000	0	10000	

DATA COLLECTION METHODOLOGY

INDICATOR 6
The total number of acres on which BMPs have been applied on an annual basis. (SPECIAL NOTE: Select all BMPs on which program is focused. BASELINE refers to the total number of acres in the target area) [CONTINUED FROM INDICATOR 5]

Year	# acres Irrigation BMPs applied	# acres other Water Quality BMPs
Baseline	10000	100000

	Target	Actual	Target	Actual
1998	1000	2000	15000	15000
1999	1000	0	15000	0
2000	1000	0	15000	0
2001	1000	0	15000	0

DATA COLLECTION METHODOLOGY

PERFORMANCE GOAL 2
To Annually increase the ability of households to safeguard the quality of their drinking water.

INDICATOR 1
The total number of Households in which at least one member completed an educational program on the use of BMPs to safeguard the quality of drinking water on an annual basis. (SPECIAL NOTE: Select all BMPs on which program is focused. BASELINE refers to the total number of households in the target area) [CONTINUED IN INDICATOR 2]

Year	# trained in Hygiene BMPs		# in Animal Waste Management BMPs		# in Nutrient Management BMP	
Baseline	200000		200000		200000	
	Target	Actual	Target	Actual	Target	Actu
1998	5000	8000	5000	5000	5000	5000
1999	5000	0	5000	0	5000	
2000	5000	0	5000	0	5000	
2001	5000	0	5000	0	5000	

DATA COLLECTION METHODOLOGY

INDICATOR 2
The total number of Households in which at least one member completed an educational program on the use of BMPs to safeguard the quality of drinking water on an annual basis. (SPECIAL NOTE: Select all BMPs on which program is focused. BASELINE refers to the total number of households in the target area) [CONTINUED FROM INDICATOR 1]

Year	# in Pesticide Management BMPs		# trained in Irrigation BMPs		# in other Wate Quality BMPs	
Baseline	200000		200000		200000	
	Target	Actual	Target	Actual	Target	Actu
1998	5000	8000	1000	1500	10000	10000
1999	5000	0	1000	0	10000	

2000	5000	0	1000	0	10000	
2001	5000	0	1000	0	10000	

DATA COLLECTION METHODOLOGY

PERFORMANCE GOAL 3
To annually increase accessibility to water quality educational programs among underserved farmers/ranchers and households.

INDICATOR 1
The total number of farmers/ranchers in under-served communities completing educational programs on the use of BMPs to protect and improve water quality on an annual basis. (SPECIAL NOTE: Select all BMPs on which program is focused. BASELINE refers to the total number of farmers/ranchers in the target area) [CONTINUED IN INDICATOR 2]

Year	# trained in Hygiene BMPs		# in Animal Waste Management BMPs		# in Nutrient Management BMP	
Baseline	20000		20000		20000	
	Target	Actual	Target	Actual	Target	Actu
1998	1000	1000	200	500	2000	2000
1999	1000	0	200	0	2000	
2000	1000	0	200	0	2000	
2001	1000	0	200	0	2000	

DATA COLLECTION METHODOLOGY

INDICATOR 2
The total number of farmers/ranchers in under-served communities completing educational programs on the use of BMPs to protect and improve water quality on an annual basis. (SPECIAL NOTE: Select all BMPs on which program is focused. BASELINE refers to the total number of farmers/ranchers in the target area) [CONTINUED FROM INDICATOR 1]

Year	# in Pesticide Management BMPs		# trained in Irrigation BMPs		# in other Wate Quality BMPs	
Baseline	20000		20000		20000	
	Target	Actual	Target	Actual	Target	Actu
1998	100	200	100	100	1000	2000
1999	100	0	100	0	1000	
2000	100	0	100	0	1000	
2001	100	0	100	0	1000	

DATA COLLECTION METHODOLOGY

INDICATOR 3
The total number of Households in under-served communities, in which at least one member has completed an educational program on the use of BMPs to safeguard water quality on an annual basis. (SPECIAL NOTE: Select all BMPs on which program is focused. BASELINE refers to the total number of households in the target area) [CONTINUED IN INDICATOR 4]

Year	# trained in Hygiene BMPs		# in Animal Waste Management BMPs		# in Nutrient Management BMP	
Baseline	10000		10000		10000	
	Target	Actual	Target	Actual	Target	Actu
1998	1000	2000	100	200	500	500
1999	1000	0	100	0	500	
2000	1000	0	100	0	500	
2001	1000	0	100	0	500	

DATA COLLECTION METHODOLOGY

INDICATOR 4
The total number of Households in under-served communities, in which at least one member has completed an educational program on the use of BMPs to safeguard water quality on an annual basis. (SPECIAL NOTE: Select all BMPs on which program is focused. BASELINE refers to the total number of households in the target area) [CONTINUED FROM INDICATOR 3]

Year	# in Pesticide Management BMPs		# trained in Irrigation BMPs		# in other Wate Quality BMPs	
Baseline	10000		10000		10000	
	Target	Actual	Target	Actual	Target	Actu
1998	100	100	100	100	200	200
1999	100	0	100	0	200	
2000	100	0	100	0	200	
2001	100	0	100	0	200	

DATA COLLECTION METHODOLOGY

INDICATOR 5
The total number of acres in under-served areas on which BMPs have been applied on an annual basis.
(SPECIAL NOTE: Select all BMPs on which program is focused. BASELINE refers to the total number of

acres in the target area) [CONTINUED IN INDICATOR 6]

Year	# acres in Hygiene BMPs		# acres in Animal Waste Mgt. BMPs		# acres in Nutri Management BMP	
Baseline	100000		100000		100000	
	Target	Actual	Target	Actual	Target	Actu
1998	10000	15000	5000	10000	20000	30000
1999	10000	0	5000	0	20000	
2000	10000	0	5000	0	20000	
2001	10000	0	5000	0	20000	

DATA COLLECTION METHODOLOGY

INDICATOR 6
The total number of acres in under-served areas on which BMPs have been applied on an annual basis. (SPECIAL NOTE: Select all BMPs on which program is focused. BASELINE refers to the total number of acres in the target area) [CONTINUED FROM INDICATOR 5]

Year	# acres Pesticide Management BMPs		# acres Irrigation BMPs applied		# acres in othe Water Quality BM	
Baseline	100000		100000		100000	
	Target	Actual	Target	Actual	Target	Actu
1998	5000	5000	1000	1000	5000	5000
1999	5000	0	1000	0	5000	
2000	5000	0	1000	0	5000	
2001	5000	0	1000	0	5000	

DATA COLLECTION METHODOLOGY

PERFORMANCE GOAL 4
To achieve or maintain an optimum level of collaboration (partnerships) with federal, state, local public and private organizations involved in water quality programs.

INDICATOR 1
The total number of farmers/ranchers, households and community water systems participating in joint programming efforts. (SPECIAL NOTE: Baseline refers to the total number in the targeted area)

Year	# farmers/ranchers participating		# households participating		# community wat systems partic	
Baseline	5000		200000		100	
	Target	Actual	Target	Actual	Target	Actu

1998	1000	1000	5000	5000	20
1999	1000	0	5000	0	20
2000	1000	0	5000	0	20
2001	1000	0	5000	0	20

DATA COLLECTION METHODOLOGY

PERFORMANCE GOAL 5
To annually expand the capacity of the program to involve youth and volunteers.

INDICATOR 1
The total number of youth and volunteers completing an educational program on the use of BMPs to protect water resources on an annual basis.

Year	# of youth trained in use of BMPs		# of volunteers trained in BMPs	
Baseline	100000		500000	
	Target	Actual	Target	Actual
1998	5000	5000	5000	5000
1999	5000	0	5000	0
2000	5000	0	5000	0
2001	5000	0	5000	0

DATA COLLECTION METHODOLOGY

INDICATOR 2
The total number of youth and volunteers from under-served areas completing an educational program on the use of BMPs to protect water resources on an annual basis.

Year	# of youth trained in use of BMPs		# of volunteers trained in BMPs	
Baseline	20000		10000	
	Target	Actual	Target	Actual
1998	4000	4000	2000	2000
1999	4000	0	2000	0
2000	4000	0	2000	0
2001	4000	0	2000	0

DATA COLLECTION METHODOLOGY

PERFORMANCE GOAL 6
To reduce the level of contaminant loadings in

ground water resources.

INDICATOR 1

The total number of people and farms/ranches in areas in which water quality programming efforts are implemented on an annual basis.

Year	# of people in program areas		# farms/ranches in program areas	
Baseline	500000		8000	
		Actual		Actual
1998		500000		8000
1999		0		0
2000		0		0
2001		0		0

DATA COLLECTION METHODOLOGY

INDICATOR 2

The total number of households and community water systems in areas in which water quality programming efforts are implemented on an annual basis.

Year	# of households in program areas		# community water systems in areas	
Baseline	200000		100	
		Actual		Actual
1998		200000		100
1999		0		0
2000		0		0
2001		0		0

DATA COLLECTION METHODOLOGY

INDICATOR 3

The total number of state population at risk from water-borne micro-biological contaminants (pfisteria, etc.), and chemical contaminants (pesticides, nitrates, etc.).

Year	population at risk from microbes		population at risk from chemicals	
Baseline	500000		100000	
		Actual		Actual
1998		500000		100000

1999		0		0
2000		0		0
2001		0		0

DATA COLLECTION METHODOLOGY

INDICATOR 4
The total number of state community water systems at risk from microbiological and chemical contaminants.

Year	# systems at risk from microbes		# systems at risk from chemicals	
Baseline	50		25	
		Actual		Actual
1998		50		25
1999		0		0
2000		0		0
2001		0		0

DATA COLLECTION METHODOLOGY

INDICATOR 5
Percent of state total population and state rural population exposed to elevated levels of nitrates in the drinking water supply.

Year	% of total population		% of rural population	
Baseline	3.00		10.00	
		Actual		Actual
1998		3.00		10.00
1999		0.00		0.00
2000		0.00		0.00
2001		0.00		0.00

DATA COLLECTION METHODOLOGY

INDICATOR 6
Percent of state total population and state rural population exposed to elevated levels of pesticides in the drinking water supply.

Year	% of total population	% of rural population
Baseline	0.01	0.10

		Actual		Actual
1998		0.01		0.01
1999		0.00		0.00
2000		0.00		0.00
2001		0.00		0.00

DATA COLLECTION METHODOLOGY

INDICATOR 7
Percent of state total population and state rural population exposed to elevated levels of microbes in the drinking water supply.

Year	% of total population	% of rural population
Baseline	10.00	40.00

		Actual		Actual
1998		10.00		40.00
1999		0.00		0.00
2000		0.00		0.00
2001		0.00		0.00

DATA COLLECTION METHODOLOGY

PROGRAM COST

Extension

Year	Federal	State	Local	Other
1998	200000	800000	400000	500000
1999	0	0	0	0
2000	0	0	0	0
2001	0	0	0	0

FTE COMMITMENT

Extension FTEs

Year	Professional			Paraprofessional		
	1862	1890	Other	1862	1890	Other

1998	14.0	7.0	5.0	2.0	2.0	2.0
1999	0.0	0.0	0.0	0.0	0.0	2.0
2000	0.0	0.0	0.0	0.0	0.0	0.0
2001	0.0	0.0	0.0	0.0	0.0	0.0

VOLUNTEER PARTICIPATION

Extension

Year	# of Volunteers
1998	500
1999	0
2000	0
2001	0

ADDITIONAL COMMENTS

PROGRAM CONTACTS
Gregory D Jennings
Associate Professor
Box 7625
North Carolina State University
Raleigh, NC 27695-6795
,
Voice phone: 919-515-6795
Fax phone : 919-515-6772
Electronic mail: GREG_JENNINGS@NCSU.EDU

NORTH CAROLINA 1998 ANNUAL REPORT:
RREA - SMITH-LEVER 3D FUNDED ITEM

GOAL ACCOMPLISHMENT NARRATIVE
Objective 1 - To produce new and value-added agricultural products and commodities.

Goals 1 - To annually increase forest, range, and wood products producer awareness, understanding, and information regarding production of new and value-added commodities and products.

Accomplishments - A total of 850 individuals completed educational programs relative to new and value-added products. Of these, 422 indicated that they adopted one or more of the recommended practices within a short time frame. It is important to note that a total of 269 commercial wood product firms indicated their adoption of new manufacturing techniques. Additionally, 1037 individuals expressed an increased knowledge of the economic importance of the wood products industry. The number of participants and adopters are significantly above the projected guidelines, indicating both a clientele interest and an aggressive educational program development.

Objective 2 - To increase the productive efficiency of the U.S. forest, range, and wood products production system.

Goal 1 - To increase agricultural producer awareness, understanding, and information on improving the productivity and global competitiveness of the U. S. forest, range and wood products system.

Accomplishments - A total of 7020 individuals completed non-formal educational programs to improve productivity of global competitiveness of the U. S. forest, range, and wood products system. Over half, 4905 received education relative to forest stewardship, a program effort encompassing multiple facets of forestland management. Additional education efforts were focused on fish and wildlife management and water quality. A total of 1435 individuals indicated that they adopted one or more of new production techniques within six months of completing these programs. Both the number of participants and the number of individuals who adopt practices are relatively close to plan projections, thus suggesting an appropriate level of activity in this subject area.

Objective 3 - To develop, transfer, and promote the adoption of efficient and sustainable forestry, and other resources conservation policies, programs, technologies, and practices that ensure ecosystems integrity and biodiversity.

Goal 1 - To increase natural resources owners and managers awareness, understanding, and information regarding the adoption of practices that sustain and/or protect ecosystem integrity and biodiversity.

Accomplishments - A total of 22,035 individuals completed non-formal educational programs on ecosystem integrity and biodiversity. About 45 percent (9820) of these individuals received programming in natural resources decision-making, indicating a strong clientele interest in making informed decisions relative to environmental issues. A total of 6311 individuals demonstrated increased awareness of natural resource issues and/or adopted recommended practices within six months of completing educational programs. The number of persons planning to adopt practices was

not reported, as estimates are not available. The number of individuals reported as either participants and adopters are reasonably close to planed projections, although additional emphasis may be needed in encouraging adoption of practices.

Objective 4 - To develop, transfer, and promote the adoption of efficient and sustainable forestry, and other resource policies, programs, technologies and practices that protect, sustain, and enhance water, soil and air resources.

Goal 1 - To increase producer adoption of natural resource management that conserve and/or protect surface and ground water supplies.

Accomplishments - A total of 3681 individuals completed non-formal educational programs relative to water quality. Additionally, 1840 individuals reported actually adopting practices presented during educational programs. These numbers represent a participation rate of over twice the number anticipated. Adoption rate was 20 percent above expected, indicating a significant clientele interest in this aspect of environmental quality. The number of persons planning to adopt recommended practices is not reported, as these estimates are not available.

Objective 5 - To improve decision-making on public policies related to the environment.

Goal 1 - To increase the effectiveness of constituent and citizen participation on public policy issues affecting the environment, ecosystem integrity and biodiversity.

Accomplishments - 6,244 individuals completed non-formal educational programs on public policy issues affecting ecosystem integrity and biodiversity. A total of 1092 individuals were reported as actually becoming actively involved in one or more public policy issues. The number of persons planning to become involved is not given due to lack of reported estimates. The reported numbers are close to plan estimates, but are slightly less than anticipated, suggesting additional efforts may be necessary to meet projections.

Objective 6 - To enhance economic opportunities and the quality of life among families and communities through natural resource enterprises.

Goal 1 - To increase economic opportunities in communities through natural resource economic development programs.

Accomplishments - 1866 public officials and community leaders completed non-formal educational programs on natural resource development. This number represents over three times the number of leaders projected to attend such programs, indicating a significant clientele interest in increasing economic opportunities through natural resource management. An estimated number of officials who adopt or are planning to adopt recommended practices is not available and is not reported.

SUCCESS STORIES
Groundwater is drawn to 160 public community wells supplying over 10,000 Gaston County residents with about 3 million gallons of groundwater per day.

Since 1988, eight public wells have been contaminated by chemical substances affecting 250 households. Costs to connect affected households to alternate water supplies exceeded $4.0 million. Since 1993 36 volunteers with the Gaston County Quality of Natural Resources Commission (QNRC), staff from the NC CES, and 13 representatives from both state and local agencies worked cooperatively towards the adoption of a county wide community wellhead protection (WHP) program. Gaston County was recognized by the Groundwater Foundation's President, Susan S. Seacrest, for it's noble efforts in groundwater protection and education. Because of QNRC's national recognition and hard work with the WHP program the Gaston County Board of County Commissioners adopted a resolution. The resolution requested that the commissioners appoint a small committee to review the QNRC's recommendations.

Hurricane Fran's devastation offered the opportunity for the Johnston County Cooperative Extension Service to network with Farm Services Agency, Natural Resources Conservation Service and N.C. Forest Service on a collaborative program. A Hurricane Recovery Meeting was conducted involving resource persons from all agencies. Each reminded participants that trees are a renewable resource and should be managed as such. As a result of an Extension Hurricane Recovery Meeting,149 landowners worked with appropriate agricultural agencies and tax professionals to develop and implement marketing or cleanup plans, management plans, accurate casualty loss, and tax liability reduction strategies.

An agent in Edgecombe County received a call from a woman that had inherited the family farm about 10 years ago. She indicated that she and her husband had decided to sell the few valuable trees left on the farm. They talked with a buyer they knew and got his offer of $13,000. Both were amazed at the value of such a few trees. Someone in their neighborhood that had used Extension's assistance on forestry management, suggested they call us for advice. From their description of age, acreage and species, we suggested they discuss timber cruising, sealed bids, and consultants with us. Eventually they sold their timber through an organized sale for $34,000. Making $21,000 more than what they thought was a great price to begin with made them very grateful for the help Extension provided.

OBJECTIVES, PERFORMANCE GOALS, AND INDICATORS

OBJECTIVE 1

To produce new and value-added agricultural products and commodities.

PERFORMANCE GOAL 1

To annually increase forest, range and wood products producer awareness, understanding, and information regarding the production of new and value-added commodities and products in which CSREES partners and cooperators play an active extension role.

INDICATOR 1

The total number of persons completing non-formal education programs on new and value-added forest, range and wood commodities and products, and the total number of these persons who actually adopt one or more recommended practices or technologies within six months after completing one or more of these programs.

Year	# of persons completing programs	# of persons who actually adopt
Baseline	540	135

	Target	Actual	Target	Actual
1998	550	850	150	422
1999	600	0	175	0
2000	600	0	175	0
2001	600	0	175	0

DATA COLLECTION METHODOLOGY

OBJECTIVE 2
To increase the productive efficiency of the U.S. forest, range, and wood products production system.

PERFORMANCE GOAL 1
To annually increase agricultural producer awareness, understanding, and information on improving the productivity and global competitiveness of the U.S. forest, range, and wood products system in which CSREES partners and cooperators play an active education role.

INDICATOR 1
The total number of persons completing non-formal education programs to improve the productivity and global competitiveness of the U.S. forest, range, and wood products system, and the total number of these persons who actually adopt one or more new production techniques or practices within six months of completing one or more of these programs.

Year	# of persons completing programs	# of persons who actually adopt
Baseline	7365	1175

	Target	Actual	Target	Actual
1998	7500	7020	1200	1435
1999	7700	0	1250	0
2000	7700	0	1250	0
2001	7700	0	1250	0

DATA COLLECTION METHODOLOGY

OBJECTIVE 3
To develop, transfer, and promote the adoption of efficient and sustainable, forestry, and other resource conservation policies, programs, technologies, and practices that ensure ecosystems integrity and biodiversity.

PERFORMANCE GOAL 1
To annually increase natural resource owners and managers awareness, understanding, and information regarding the adoption practices that sustain and/or protect ecosystem integrity and biodiversity in which CSREES partners and cooperators play an active extension role.

INDICATOR 1
The total number of persons completing non-formal education programs on sustaining and protecting ecosystem integrity and biodiversity while improving the productivity of the U.S. natural resource lands, the total number of these person who plan to adopt one or more recommended practices, and the total number of these persons who actually adopt one or more recommended practices within six months after completing one or more of these programs.

Year	# of persons completing programs		# of persons planning to adopt		# of persons who actually ado	
Baseline	16276		0		6601	
	Target	Actual	Target	Actual	Target	Actu
1998	17000	22035	0	0	7000	6311
1999	17500	0	0	0	7200	
2000	17500	0	0	0	7200	
2001	17500	0	0	0	7200	

DATA COLLECTION METHODOLOGY

OBJECTIVE 4
To develop, transfer, and promote adoption of efficient and sustainable forestry, and other resource policies, programs, technologies, and practices that protect, sustain, and enhance water, soil and air resources.

PERFORMANCE GOAL 1
To annually increase producer adoption of natural resource management that conserve and/or protect surface and ground water supplies.

INDICATOR 1
The total number of persons completing non-formal education programs on sustaining and/or protecting the quantity and quality of surface water and ground water supplies on natural resource lands, the total number of these persons who plan to adopt one or more water practices, and the total number of persons who actually adopt one or more water practices within six months after completing one or more of these programs.

Year	# of persons completing programs		# of persons planning to adopt		# of persons who actually adc	
Baseline	1642		0		1476	
	Target	Actual	Target	Actual	Target	Actu
1998	1700	3681	0	0	1500	1840
1999	1800	0	0	0	1575	
2000	1800	0	0	0	1575	

2001	1800	0	0	0	1575

DATA COLLECTION METHODOLOGY

OBJECTIVE 5
To improve decision-making on public policies related to the environment.

PERFORMANCE GOAL 1
To annually increase the effectiveness of constituent and citizen participation on public policy issues affecting the environment, and ecosystem integrity and biodiversity.

INDICATOR 1
The total number of persons completing non-formal education programs on public policy issues affecting ecosystem integrity and biodiversity, the total number of these persons who plan to become actively involved in one or more public policy issues, and the total number of these person who actually become actively involved in one or more public policy issues within six months after completing one or more of these programs.

Year	# of persons completing programs		# of persons planning to adopt		# of persons who actually ado	
Baseline	6682		0		1167	
	Target	Actual	Target	Actual	Target	Actu
1998	7000	6244	0	0	1200	1092
1999	7500	0	0	0	1300	
2000	7500	0	0	0	1300	
2001	7500	0	0	0	1300	

DATA COLLECTION METHODOLOGY

OBJECTIVE 6
To enhance economic opportunities and the quality of life among families and communities through natural resource enterprises.

PERFORMANCE GOAL 1
To annually increase economic opportunities in communities through natural resource economic development programs in which CSREES partners and cooperators play an active extension role.

INDICATOR 1
The total number of public officials and community leaders completing non-formal education programs on natural resource economic development, the total number of these public officials who plan to adopt one or more recommended practices to attract new businesses or help expand existing businesses, and the total number of these public officials who actually adopt one or more recommended practices to attract new businesses or help expand existing businesses after completing one or more of these programs.

Year	# of public offic. completing programs		# of public offic. planning to adopt		# of public offi who actually ado	
Baseline	568		0		0	
	Target	Actual	Target	Actual	Target	Actu
1998	600	1866	0	0	0	
1999	650	0	0	0	0	
2000	650	0	0	0	0	
2001	650	0	0	0	0	

DATA COLLECTION METHODOLOGY

INDICATOR 2
The number of new natural resource-based businesses started through economic development programs developed in collaboration with CSREES partners and cooperators.

Year	# of new businesses started	
Baseline	0	
	Target	Actual
1998	0	0
1999	0	0
2000	0	0
2001	0	0

DATA COLLECTION METHODOLOGY

INDICATOR 3
The number of existing natural resource-based businesses maintaining or expanding operations resulting from economic development programs developed in collaboration with CSREES partners and cooperators.

Year	# of existing maintaining or exp.	
Baseline	0	
	Target	Actual
1998	0	0
1999	0	0
2000	0	0
2001	0	0

DATA COLLECTION METHODOLOGY

INDICATOR 4
The number of jobs created by the formation of new natural resource businesses and expansion of existing businesses resulting from economic development programs developed in collaboration with CSREES partners and cooperators.

Year	# of jobs created		
Baseline	0		
	Target	Actual	
1998	0	0	
1999	0	0	
2000	0	0	
2001	0	0	

DATA COLLECTION METHODOLOGY

PROGRAM COST

Extension

Year	Federal	State	Local	Other
1998	535000	1329000	217000	0
1999	0	0	0	0
2000	0	0	0	0
2001	0	0	0	0

FTE COMMITMENT

Extension FTEs

Year	Professional			Paraprofessional		
	1862	1890	Other	1862	1890	Other
1998	26.0	0.5	0.0	2.0	1.0	0.0
1999	0.0	0.0	0.0	0.0	0.0	0.0
2000	0.0	0.0	0.0	0.0	0.0	0.0
2001	0.0	0.0	0.0	0.0	0.0	0.0

VOLUNTEER PARTICIPATION

Extension

Year	# of Volunteers
1998	3273
1999	0
2000	0
2001	0

ADDITIONAL COMMENTS

PROGRAM CONTACTS

Craig R McKinley
Department Extension Leader
Box 3028-F
Biltmore Hall, Box 8003
North Carolina State University
Raleigh, NC 27695
Voice phone: 919-515-5576
Fax phone : 919-515-6883
Electronic mail: Craig_Mckinley@ncsu.edu

NORTH CAROLINA 1998 ANNUAL REPORT:
SUSTAINABLE AGRICULTURE - SMITH-LEVER 3D FUNDED ITEM

GOAL ACCOMPLISHMENT NARRATIVE

Several program activities carried out during 1998 increased extension agent and producer awareness, understanding an information regarding the adoption of agricultural production practices that sustain and protect ecosystem integrity and biodiversity.

Five rotational grazing schools were offered in differnt locations thoughout the state. Four of these two-day schools focused on producers and extension agents, while a fifth ten-day school was conducted for a national NRCS audience. These information-intensive workshops concentrated on principles of sustainability grassland ecology, grazing management, nutrient cycling, grazing sysytem design, watering systems, importance of riparian buffers and economic viability.

An organic vegetable prodution school was held at the Mountain Horticultural Research Station for agents and producers.

Sponsorship of 10 extension agents (travel and registration) for the 1998 Sustainable Agriculture conference held in Clemson, SC. This conference, sponsored by The Carolina Farm Stewardship Association and N.C. Cooperative Extension Services was attended by over 400 persons and offered numerous workshops lectures and field trips.

An intensive, 6-session training program dealing with organic farming production principles and practices was conducted.

SUCCESS STORIES

A series of workshops for extension specialists, agents, mentor farmers (described below), consultants, NRCS employees, and other teaching professionals, emphasizing how the major components of organic production systems can be incorporated into a productive management system was completed during 1998. This effort was lead by Dr. Nancy Creamer (NCSU Horticulture) with assitance from Dr. Keith Baldwin. Major focus of each workshop was the integration of the various crop production factors into a working system. Participants learned how to critically asses and evaluate farm needs in relation to sustainable agricultural practices. Graduate credit through NCSU was offered to those agents who participated in the entire series.

Demonstrations were carried out at The Center for Environmental Farming Systems (organic unit), and on farms, to provide hands-on experiential learning opportunities in conjunction with each of the workshops.

Organic producers were integrated into the training by including tours of various farms, and including farmers with specific expertise as facilitators and trainers at the workshops. A training manual which will include chapters from each of the workshops is in the final stages of development. These "modules" will not only include complete information on their respective topics, but also detailed examples of field demonstrations that participants can implement to aid them in training growers. The edited training manual will be made available to other States in the southern region.

A farmer-to-farmer mentorship program was established to utilize successful organic growers in training other prospective growers. Agents were also encouraged to actively recruit interested farmers to participate in the mentorship program.

Existing programs providing training on organic production were incorporated into this program, in part, by providing funds for agents to attend these

activities. These include the annual CFSA conference, annual organic vegetable schools in the western part of the state and in the piedmont, and farm tours in central, eastern, and western North Carolina As proposed in this grant, training of agents and other ag educators took place between April, 1998 and November 1998. Six, two-day workshops were conducted, and a wrap-up meeting was held at the annual extension conference in November. Approximately 52 NC agents attended at least one session, in addition to 12 participants from Florida and 6 from Virginia. Approximately 40 agents came to all the sessions, and completed all assignments, and 32 of those enrolled for graduate credit. Each workshop covered areas critical to organic production, and included organic fertility management, composting, cover cropping, impacts of crop rotation, designing whole farm systems, soil biology/ecology/quality, delivery systems for disseminating information to organic producers, oganic insect, weed, and disease management, tillage systems, organic greenhouse management, integrating animals into organic production systems, and involving farmers in sustainable agriculture. Each workshop had hands-on field demonstrations as an integral part, and most incorporated field trips and farm tours. Some examples of the field demonstrations are: planting crops at weekly intervals and observing differences in weed populations; planting strips of various winter and summer cover crops and rating them for biomass production; utilizing soil quality kits, etc. A key component to the workshops were the integrated and interdisciplinary approach to teaching about organic production systems. Even though each workshop had a specific topic as a focus (eg., organic fertility management) , facilitators were expected to integrate other disciplines into the workshop The Carolina Farm Stewardship Association's Sustainable Agriculture Conference was recently held and the poster session was very successful. Conference attendance was very high, with more than 500 registered. Many of the agents who participated in the training also attended this conference for the first time. At the conference, we presented a plan to establish a mentorship program which will take primarily take the form of an on-farm research network. Many agents and growers attended the session and signed up to participate. We have a very interested and enthusiastic group ready to work together on this effort. The manual is in its last stages of development, and we hope to have the first draft ready for review in February.

OBJECTIVES, PERFORMANCE GOALS, AND INDICATORS

OBJECTIVE 1

To develop, transfer, and promote the adoption of efficient and sustainable agricultural, forestry, and other resource conservation policies, programs, technologies, and practices that ensure ecosystems integrity and biodiversity.

PERFORMANCE GOAL 1

To annually increase agricultural extension agent and producer awareness, understanding, and information regarding the adoption of agricultural production practices that sustain and/or protect ecosystem integrity and biodiversity.

INDICATOR 1

The total number of farmers with expertise in sustainable agriculture who serve as extension trainers for non-formal education programs on sustaining and protecting ecosystem integrity and biodiversity while improving the productivity of the U.S. agricultural production system.

Year	# of farmers who serve as trainers

Baseline	3	
	Target	Actual
1998	6	10
1999	10	0
2000	20	0
2001	40	0

DATA COLLECTION METHODOLOGY

INDICATOR 2
The total number of persons with extension appointments (or responsibilities) completing non-formal education programs on sustaining and protecting ecosystem integrity and biodiversity while improving the productivity of the U.S. agricultural production system, the total number of these persons who plan to recommend one or more sustainable agricultural practices, and the total number of these persons who actually recommend one or more sustainable agricultural practices within six months after completing one or more of these programs.

Year	# completing programs		# who plan to recommend practices		# who actually recommend practi	
Baseline	45		0		20	
	Target	Actual	Target	Actual	Target	Actu
1998	55	65	0	0	30	35
1999	75	0	0	0	50	
2000	100	0	0	0	75	
2001	150	0	0	0	100	

DATA COLLECTION METHODOLOGY

INDICATOR 3
The total number of persons completing non-formal education programs on sustaining and protecting ecosystem integrity and biodiversity while improving the productivity of the U.S. agricultural production system, the total number of these persons who plan to adopt one or more recommended practices, and the total number of these persons who actually adopt one or more recommended practices within six months after completing one or more of these programs.

Year	# completing non-formal programs	# who plan to adopt practices	# who actually adopt practice
Baseline	45	0	20

	Target	Actual	Target	Actual	Target	Actu
1998	55	65	0	0	40	50
1999	75	0	0	0	50	
2000	100	0	0	0	75	
2001	150	0	0	0	100	

DATA COLLECTION METHODOLOGY

PROGRAM COST

Extension

Year	Federal	State	Local	Other
1998	473967	302290	137576	0
1999	0	0	0	0
2000	0	0	0	0
2001	0	0	0	0

FTE COMMITMENT

Extension FTEs

Year	Professional			Paraprofessional		
	1862	1890	Other	1862	1890	Other
1998	9.0	1.2	0.0	2.0	2.0	0.0
1999	0.0	0.0	0.0	0.0	0.0	0.0
2000	0.0	0.0	0.0	0.0	0.0	0.0
2001	0.0	0.0	0.0	0.0	0.0	0.0

VOLUNTEER PARTICIPATION

Extension

Year	# of Volunteers
1998	19
1999	0
2000	0

2001	0

ADDITIONAL COMMENTS
We have chosen not to report against performance indicators that refer to what people intend to do.

PROGRAM CONTACTS

J. Paul Mueller (Prog)
Professor
Box 7620
Department of Crop Science
NCSU Campus
Raleigh, NC 27695-7620
Voice phone: 919-515-5825
Fax phone : 919-515-5855
Electronic mail: Paul_Mueller@ncsu.edu

John M. O'Sullivan (Prog)
Farm Management and Marketing Specialist
P.O. Box 21928
North Carolina A & T State University
Greensboro, NC 27455
Voice phone: 336-334-7957
Fax phone : 336-334-7207
Electronic mail: johno@aurora.ncat.edu

NORTH CAROLINA 1998 ANNUAL REPORT:
INTEGRATED PEST MANAGEMENT - SMITH-LEVER 3D FUNDED ITEM

GOAL ACCOMPLISHMENT NARRATIVE

This report focuses on cotton, apples, and peanuts. Extension agent reports show that the IPM program has influenced over 250,000 acres of these crops. Farmers are using designated IPM practices such as pesticide applications based upon scouting and thresholds, pesticide applications based upon predictive models, crop rotations designed to reduce pest pressure or destroy pest establishment and survival, pest resistant varieties, and early planting and use of early maturing varieties to avoid pest problems. Additionally, forecasting models and insect trap data provided to growers are having an impact, especially when pest levels vary (either up or down) from historial levels. Over 20 scouting/pest management schools were held this year with an average attendance of 35. On-farm demonstrations were conductd on over 30 farms with grower participants. Examples of this in apple was demonstrations of a degree-day (DD) model for tufted apple bud moth (TABM). The DD on-farm demonstrations showed that predictive models can accurately time insecticide treatments and reduce insecticide sprays. This year an average of one insecticide treatment was saved with no difference in quality. Apple disease predictive models (for scab) and pheromone traps (for codling moth) reduced treatments or better timed applications. Apple leaf litter on the orchard floor causes increased disease and insect problems. As a result of an on-farm demonstration, a grower modified a piece of equipment to gather and mulch leaf litter, saving both fungicide and insecticide treatments. Peanut demonstrations showed that reductions in automatice soil insecticide treatments are possible using a predictive risk index for Southern corn rootworm (scrw). Using the SCRW risk index, only 33% of fields needed treatment versus the conventional average of 60% of fields treated. This represents a large reduction in insecticide use. The leafspot advisory covers all peanut growing counties and is carefully followed by growers. One agribusiness owner observed that all his customers followed the advisory. In a dry year such as this one, the leafspot advisory saves growers $14 - 25/acre, a savings statewide of over $2.5 million. Over 200 growers have been involved in IPM training efforts. Special projects are used to bring emphasis to IPM. On northeast NC farms a program to identify IPM farms is underway. Growers who use a prescribed list of IPM practices are designated as "IPM Farms" and obtain special recognition by a road sign. Cotton was a special challenge to the IPM program this year. Several insect pests arrived sooner and at higher levels than normal. Early warning IPM systems alerted consultants and growers. This effort prevented excessive insecticide applications, saving growers money and slowing the spread of resistance. Budworms were at high levels this year but the IPM emphasis on using beneficial insects and allowing the plant to compensate for damage prevented excessive insecticide treatments. Cotton aphids were more widespread and persistant. However, only 1% of the state acreage was treated as growers were advised to allow biological control to take care of this pest. Biological control is practical and effective on this pest. Growers are familiar with this approach and followed the advisories. A new, higher, budworm threshold was introduced this year and was followed closely by consultants and growers. This new threshold allows biological control agents to be more effective and reduces the probability of insecticide use. Bollworm populations were normal and the resulting number of insecticide applications was average showing that cotton growers are scouting, using economic thresholds, and listening to IPM advisories. Special emphasis is on hastening maturity of the crop to reduce the time the crop is in a vulnerable stage. When major insect pests are early, as they were this year, early maturity pays.

OBJECTIVES, PERFORMANCE GOALS, AND INDICATORS

OBJECTIVE 1

To develop, transfer, and promote the adoption of efficient and sustainable agricultural, forestry, and other resource conservation policies, programs, technologies, and practices that ensure ecosystems integrity and biodiversity.

PERFORMANCE GOAL 1

To annually ensure ecosystems integrity and biodiversity. (Acres of IPM Practices)

INDICATOR 1

For Commodity #1: The total number of acres of agricultural cropland, and the total number of acres of agricultural cropland on which the state's or territory's minimum recommended set of integrated pest management practices have been adopted by agricultural producers for selected crops.

Year	# of acres		# of acres of IPM recommended pract.	
Baseline	700000		100000	
	Target	Actual	Target	Actual
1998	200000	200000	125000	125000
1999	200000	0	175000	0
2000	300000	0	200000	0
2001	550000	0	300000	0
Commodity: cotton				

DATA COLLECTION METHODOLOGY

Data from field faculty, campus based faculty, agribusiness, and agricultural consultants will be used to compare grower IPM practice adoption to a weighted set of recommended IPM practices. Minimum adoption scores will be used to determine the number of acres under IPM.

INDICATOR 2

For Commodity #2: The total number of acres of agricultural cropland, and the total number of acres of agricultural cropland on which the state's or territory's minimum recommended set of integrated pest management practices have been adopted by agricultural producers for selected crops.

Year	# of acres		# of acres of IPM recommended pract.	
Baseline	125000		25000	
	Target	Actual	Target	Actual
1998	125000	100000	25000	25000

1999	125000	0	50000	0
2000	125000	0	75000	0
2001	125000	0	100000	0

Commodity: peanuts

DATA COLLECTION METHODOLOGY
Data from field faculty, campus based faculty, agribusiness, and agricultural consultants will be used to compare grower IPM practice adoption to a weighted set of recommended IPM practices. Minimum adoption scores will be used to determine the number of acres under IPM.

INDICATOR 3
For Commodity #3: The total number of acres of agricultural cropland, and the total number of acres of agricultural cropland on which the state's or territory's minimum recommended set of integrated pest management practices have been adopted by agricultural producers for selected crops.

Year	# of acres		# of acres of IPM recommended pract.	
Baseline	5000		500	
	Target	Actual	Target	Actual
1998	5000	3000	1000	500
1999	5000	0	1500	0
2000	5000	0	2000	0
2001	5000	0	4000	0

Commodity: apples

DATA COLLECTION METHODOLOGY
Data from field faculty, campus based faculty, agribusiness, and agricultural consultants will be used to compare grower IPM practice adoption to a weighted set of recommended IPM practices. Minimum adoption scores will be used to determine the number of acres under IPM.

INDICATOR 4
For Commodity #4: The total number of acres of agricultural cropland, and the total number of acres of agricultural cropland on which the state's or territory's minimum recommended set of integrated pest management practices have been adopted by agricultural producers for selected crops.

Year	# of acres	# of acres of IPM recommended pract.
Baseline	0	0

	Target	Actual	Target	Actual
1998	0	0	0	0
1999	0	0	0	0
2000	0	0	0	0
2001	0	0	0	0

Commodity:

DATA COLLECTION METHODOLOGY

INDICATOR 5
For Commodity #5: The total number of acres of agricultural cropland, and the total number of acres of agricultural cropland on which the state's or territory's minimum recommended set of integrated pest management practices have been adopted by agricultural producers for selected crops.

Year	# of acres	# of acres of IPM recommended pract.
Baseline	0	0

	Target	Actual	Target	Actual
1998	0	0	0	0
1999	0	0	0	0
2000	0	0	0	0
2001	0	0	0	0

Commodity:

DATA COLLECTION METHODOLOGY

PERFORMANCE GOAL 2
To annually ensure ecosystems integrity and biodiversity. (Pesticide Applications)

INDICATOR 1
For Commodity #1: The total pounds of pesticide applied, and the total number of pesticide applications on selected crops that utilize the state's or territory's minimum set of recommended integrated pest management practices.

Year	# of pounds of pesticide applied	# of pesticide applications
Baseline	0	0

	Target	Actual	Target	Actual
1998	0	0	0	0

1999	0	0	0	0
2000	0	0	0	0
2001	0	0	0	0

Commodity:

DATA COLLECTION METHODOLOGY

INDICATOR 2
For Commodity #2: The total pounds of pesticide applied, and the total number of pesticide applications on selected crops that utilize the state's or territory's minimum set of recommended integrated pest management practices.

Year	# of pounds of pesticide applied		# of pesticide applications	
Baseline	0		0	
	Target	Actual	Target	Actual
1998	0	0	0	0
1999	0	0	0	0
2000	0	0	0	0
2001	0	0	0	0

Commodity:

DATA COLLECTION METHODOLOGY

INDICATOR 3
For Commodity #3: The total pounds of pesticide applied, and the total number of pesticide applications on selected crops that utilize the state's or territory's minimum set of recommended integrated pest management practices.

Year	# of pounds of pesticide applied		# of pesticide applications	
Baseline	0		0	
	Target	Actual	Target	Actual
1998	0	0	0	0
1999	0	0	0	0
2000	0	0	0	0
2001	0	0	0	0

Commodity:

DATA COLLECTION METHODOLOGY

INDICATOR 4
For Commodity #4: The total pounds of pesticide applied, and the total number of pesticide applications on selected crops that utilize the state's or territory's minimum set of recommended integrated pest management practices.

Year	# of pounds of pesticide applied		# of pesticide applications	
Baseline	0		0	
	Target	Actual	Target	Actual
1998	0	0	0	0
1999	0	0	0	0
2000	0	0	0	0
2001	0	0	0	0
Commodity:				

DATA COLLECTION METHODOLOGY

INDICATOR 5
For Commodity #5: The total pounds of pesticide applied, and the total number of pesticide applications on selected crops that utilize the state's or territory's minimum set of recommended integrated pest management practices.

Year	# of pounds of pesticide applied		# of pesticide applications	
Baseline	0		0	
	Target	Actual	Target	Actual
1998	0	0	0	0
1999	0	0	0	0
2000	0	0	0	0
2001	0	0	0	0
Commodity:				

DATA COLLECTION METHODOLOGY

PERFORMANCE GOAL 3
To annually ensure ecosystems integrity and biodiversity. (Yield and Dollar value)

INDICATOR 1
For Commodity #1: The total yield, and the total dollar value of selected crops that utilize the state's or

territory's minimum set of recommended integrated pest management practices.

Year	Total yield		Total dollar value	
Baseline	0		0	
	Target	Actual	Target	Actual
1998	0	0	0	0
1999	0	0	0	0
2000	0	0	0	0
2001	0	0	0	0
Commodity:				

DATA COLLECTION METHODOLOGY

INDICATOR 2
For Commodity #2: The total yield, and the total dollar value of selected crops that utilize the state's or territory's minimum set of recommended integrated pest management practices.

Year	Total yield		Total dollar value	
Baseline	0		0	
	Target	Actual	Target	Actual
1998	0	0	0	0
1999	0	0	0	0
2000	0	0	0	0
2001	0	0	0	0
Commodity:				

DATA COLLECTION METHODOLOGY

INDICATOR 3
For Commodity #3: The total yield, and the total dollar value of selected crops that utilize the state's or territory's minimum set of recommended integrated pest management practices.

Year	Total yield		Total dollar value	
Baseline	0		0	
	Target	Actual	Target	Actual

1998	0	0	0	0
1999	0	0	0	0
2000	0	0	0	0
2001	0	0	0	0

Commodity:

DATA COLLECTION METHODOLOGY

INDICATOR 4

For Commodity #4: The total yield, and the total dollar value of selected crops that utilize the state's or territory's minimum set of recommended integrated pest management practices.

Year	Total yield		Total dollar value	
Baseline	0		0	
	Target	Actual	Target	Actual
1998	0	0	0	0
1999	0	0	0	0
2000	0	0	0	0
2001	0	0	0	0

Commodity:

DATA COLLECTION METHODOLOGY

INDICATOR 5

For Commodity #5: The total yield, and the total dollar value of selected crops that utilize the state's or territory's minimum set of recommended integrated pest management practices.

Year	Total yield		Total dollar value	
Baseline	0		0	
	Target	Actual	Target	Actual
1998	0	0	0	0
1999	0	0	0	0
2000	0	0	0	0
2001	0	0	0	0

Commodity:

DATA COLLECTION METHODOLOGY

PERFORMANCE GOAL 4
To annually increase agricultural producer awareness, understanding, and information regarding the adoption of agricultural production practices that sustain and/or protect ecosystem integrity and biodiversity in which CSREES partners and cooperators play an active extension role.

INDICATOR 1
The total number of agricultural producers who complete non-formal education programs on integrated pest management practices, the total number of these producers who plan to adopt, and the total number of these producers who actually adopt the state's or territory's minimum set of recommended integrated pest management practices within six months after completing one or more of these programs.

Year	# of producers completing progs.		# who plan to adopt IPM practices		# who actually adopt IPM practi	
Baseline	0		0		0	
	Target	Actual	Target	Actual	Target	Actu
1998	0	0	0	0	0	
1999	0	0	0	0	0	
2000	0	0	0	0	0	
2001	0	0	0	0	0	

DATA COLLECTION METHODOLOGY

PROGRAM COST

Extension

Year	Federal	State	Local	Other
1998	0	0	0	0
1999	0	0	0	0
2000	0	0	0	0
2001	0	0	0	0

FTE COMMITMENT

Extension FTEs

Year	Professional			Paraprofessional		

	1862	1890	Other	1862	1890	Other
1998	30.0	2.0	2.0	10.0	1.0	2.0
1999	0.0	0.0	0.0	0.0	0.0	2.0
2000	0.0	0.0	0.0	0.0	0.0	0.0
2001	0.0	0.0	0.0	0.0	0.0	0.0

VOLUNTEER PARTICIPATION

Extension

Year	# of Volunteers
1998	75
1999	0
2000	0
2001	0

ADDITIONAL COMMENTS

PROGRAM CONTACTS

Mike Linker (Prog, Data)
IPM Coordinator
Box 7620
N. C. State University
Raleigh, N. C. 27695-7620
,
Voice phone: 919-515-5644
Fax phone : 919-515-5315
Electronic mail: mike_linker@ncsu.edu

NORTH CAROLINA 1998 ANNUAL REPORT:
PESTICIDE APPLICATOR TRAINING - SMITH-LEVER 3D FUNDED ITEM

GOAL ACCOMPLISHMENT NARRATIVE

North Carolina recorded 28,007 private pesticide applicators in 1997. Applicators were certified by attending a 4 hour class with emphasis on the Federal core "Applying Pesticides Correctly" manual. Five slide/tapes sets were prepared in North Carolina for this program. These lessons are (1) Pest Control/Labeling/Formulations, (2) Pesticides in the Environment, (3) Harmful Affects/Protective Clothing, (4) Handling and Decision Making and (5) Calibration/Transportation/Storage/Disposal. A sixth slide/tape set covers Federal and NC pesticide laws and regulations. A second certification method involved the completion of a Applying Pesticides Correctly Programmed Instruction Workbook and then meeting with the County Pesticide Coordinator for a 30-minute review and test. This manual was also used by applicators who failed to get re-certified and were required to pass a state administered written exam to get recertified. This manual was revised in 1994 and a chapter on the Worker Protection Standard was added. The number fof private applicators newly certified in 1997 was 899.

Private pesticide applicators must be recertified every three years. Applicators were certified by attending a 2-hour class conducted by the County Pesticide Coordinator. This was the fifth 3-year recertification cycle conducted for private applicators. Every 3 years pertinent subjects and a current review of laws and regulations are covered. The number of private applicators recertified in 1997 was 8,227.

The number of commercial applicators recorded in North Carolina in 1997 was 10,858. Eighteen pesticide schools were held across the state to train new applicators/dealers. The first day of these 2-day schools is spent on core material using the slide sets developed for private applicator training. The first half of the second day is spent on specialized training in the various license subclasses. On the second afternoon, the N.C. Department of Agriculture and Consumer Services offers exams in all commercial applicator categories. The number of commercial applicators newly certified in 1997 was 1,694.

A multitude of recertification opportunities were offered to commercial pesticide applicators in 1997. The number of applicators, broken down by licence category, recertified through training or testing during the year follows: Aquatic (223), Public Health (124), Forest (301), Right-of-way (662), Regulatory (51), Ag. Animal (81), Ornamental/Turf (2,082), Seed Treatment (15), Demonstration and Research (587), Ag. Pest (851), Wood Treatment (25), and Aerial (179).

SUCCESS STORIES

A pesticide spray drift reduction project supported in part by the North Carolina Department of Agriculture and Consumer Services and the NC Cooperative Extension Service was initiated in the fall of 1997. Using computer-based portable swath analysis and drift detection equipment, Dr. Ernest Hewett, drift reduction project leader from the Department of Biological and Agricultural Engineering, North Carolina State University, provided 12 aerial applicators with swath and droplet analysis in the first demonstration, Nov 6-8.

All certified aerial applicators in NC are invited to attend the fly-in clinics that are scheduled at various locations where aerial application methods are used in the state. Participation is voluntary. The first group

of applicators to call for an appointment received free pattern, drift and droplet analysis. All attendees received recertification credits towards their applicators' license. Following analysis of spray distribution, Dr. Hewett and his supervisor, Dr. Sterling Southern, Professor of Entomology, NCSU, recommended appropriate modifications of application equipment or technique to help the applicator reduce or eliminate off-target drift. The program is coordinated in conjunction with the National Agricultural Aviation Association's Operation SAFE (Self-Regulating Application and Flight Efficiency). The Drift Reduction Project hopes to increase its scope of training and analysis for high-risk application methods other than aerial application, such as the use of air blast sprayers in fruit and Christmas tree production and mist blowers in vegetable production.

OBJECTIVES, PERFORMANCE GOALS, AND INDICATORS

OBJECTIVE 1

To develop, transfer, and promote adoption of efficient and sustainable agricultural, forestry, and other resource policies, programs, technologies, and practices that ensure ecosystems integrity and biodiversity.

PERFORMANCE GOAL 1

To annually increase agricultural producer awareness, understanding, and information regarding the adoption of agricultural production practices that sustain and/or protect ecosystem integrity and biodiversity in which CSREES partners play an active extension role.

INDICATOR 1

The total number of trainees completing private non-formal education programs involving pesticide applicator training (PAT), the total number of those trainees who plan to adopt one or more recommended PAT practices, and the total number of those trainees who actually adopt one or more recommended PAT practices within six months after completing one or more of these training programs.

Year	# of trainees completing private		# who plan to adopt practices		# who actually adopt practice	
Baseline	0		0		0	
	Target	Actual	Target	Actual	Target	Actu
1998	0	0	0	0	0	
1999	0	0	0	0	0	
2000	0	0	0	0	0	
2001	0	0	0	0	0	

DATA COLLECTION METHODOLOGY

INDICATOR 2

The total number of trainees completing commercial non-formal education programs involving pesticide applicator training (PAT) for certification or recertification, the total number of those trainees who plan to adopt one or more recommended PAT practices, and the total number of those trainees who actually adopt one or more recommended PAT practices after completing one or

more of these training and certification/recertification programs.

Year	# of trainees in commercial		# who plan to adopt practices		# who actually adopt practice	
Baseline	0		0		0	
	Target	Actual	Target	Actual	Target	Actu
1998	0	0	0	0	0	
1999	0	0	0	0	0	
2000	0	0	0	0	0	
2001	0	0	0	0	0	

DATA COLLECTION METHODOLOGY

INDICATOR 3
The total number of citizens completing non-formal education programs involving the safe application and use of pesticides in the home or office, the total number of these citizens who plan to adopt one or more recommended PAT practices, and the total number of these citizens who actually adopt one or more recommended PAT practices within six months after completing one or more of these programs.

Year	# of citizens completing program		# who plan to adopt practices		# who actually adopt practice	
Baseline	0		0		0	
	Target	Actual	Target	Actual	Target	Actu
1998	0	0	0	0	0	
1999	0	0	0	0	0	
2000	0	0	0	0	0	
2001	0	0	0	0	0	

DATA COLLECTION METHODOLOGY

INDICATOR 4
The total number of complaints filed for mis-use of pesticides by people operating as commercial pesticide applicators.

Year	# of complaints filed for mis-use	
Baseline	0	
	Target	Actual
1998	0	0

1999	0	0
2000	0	0
2001	0	0

DATA COLLECTION METHODOLOGY

PROGRAM COST

Extension

Year	Federal	State	Local	Other
1998	81881	217250	82500	0
1999	81881	217250	82500	0
2000	81881	217250	82500	0
2001	81881	217250	82500	0

FTE COMMITMENT

Extension FTEs

Year	Professional			Paraprofessional		
	1862	1890	Other	1862	1890	Other
1998	8.5	0.0	0.0	0.5	0.0	0.0
1999	8.5	0.0	0.0	0.5	0.0	0.0
2000	8.5	0.0	0.0	0.5	0.0	0.0
2001	8.5	0.0	0.0	0.5	0.0	0.0

VOLUNTEER PARTICIPATION

Extension

Year	# of Volunteers
1998	0
1999	0
2000	0
2001	0

ADDITIONAL COMMENTS

PROGRAM CONTACTS

Wayne George Buhler (Prog, Data)
Pesticide Education Specialist
Department of Horticultural Science
Campus Box 7609
North Carolina State University
Raleigh, NC 27695
Voice phone: 919-515-5369
Fax phone : 919-515-7747
Electronic mail: wayne_buhler@ncsu.edu

NORTH CAROLINA 1998 ANNUAL REPORT:
FOOD SAFETY AND QUALITY - SMITH-LEVER 3D FUNDED ITEM

GOAL ACCOMPLISHMENT NARRATIVE
OBJECTIVE 1
To improve food safety by controlling or eliminating foodborne risks.

PERFORMANCE GOAL 1
To annually increase consumer awareness, understanding, and information regarding food safety and foodborne risks and illnesses in which CREES partners and cooperators play an active extension role, in food handler training, HACCP training and model HACCP training programs for fruits and vegetables.

Food Handlers
SERV SAFE.
SERV SAFE: Serving Safe Food is a nationally recognized 16-hour certification program developed by the National Restaurant Association. In 1998, 30 county teams made up of extension agents and environmental health specialists have been formed and are actively planning joint SERV SAFE trainings for local food service managers and employees. This is an increase from 11 teams in 1997. Twenty-one teams, within and across counties, have successfully conducted this training for 325 food service operators in North Carolina. This compares to 243 trained food service operators by 5 teams in 1997. In addition, four counties have conducted an SERV SAFE based program for 175 food service employees. This is a shorter more applied version of SERV SAFE aimed at workers rather than managers. This is an expansion of the types of food service training offered in 1998. The workshop announcements are being posted on the NCCES food safety website to inform the public of these food service training opportunities in their area.
NCSU has also conducted this training twice in 1998 for 30 owners, operators or managers of McDonald's restaurants located in North Carolina. As a result of this training, McDonald's regional management has reported that food safety is being addressed during orientation trainings. Also, food safety audits and checks are being routinely conducted at all restaurants.

Food Safety
Seven 16-hour trainings were conducted for a total of 108 congregate nutrition site coordinators from across North Carolina. Training topics included general food safety and sanitation.
Two Better Process Control Schools were conducted for a total of 60 participants. One of the schools was conducted in conjunction with an aseptic processing shortcourse. This training is necessary for all companies who thermally process their products.
Four programs were conducted for 91 participants in the special forces airborne on fabrication and handling muscle foods while on tour in third world countries.
Three presentations were given to 80 school food service directors on food safety basics at the child nutrition conference.
Conducted a pilot training program in five counties entitled "Target Food Safety." Of the 115 participant 41 completed both the pre- and post-tests. The two most commonly sited benefits were learning "how to cool hot foods" and "how to sanitize cutting boards."

Food Inspectors
North Carolina has a unique training program designed to provide the new environmental health sanitarians with the basic knowledge in the areas needed to carry out their responsibilities. Food safety is one of the

critical areas for those who are expected to make food safety decision during restaurant inspections. The DHHS has joined with NCCES to offer food science and food safety training to 40 food inspectors twice annually. A seafood safety and quality symposium is held annually for 40 environmental health specialists to increase their knowledge about local seafood products and provide training to help them in making better information decisions when inspecting seafood operations.

Food Safety Youth Symposium

NCCES has conducted a Food Safety and Quality Symposium for youth (ages 15-17) since 1995. The project's overall objective is to increase understanding of food-related risks and the policy and scientific bases for risk management decisions. Nineteen youth and one adult leader participated in the 1998 symposium. A questionnaire was given to the participants at the beginning and the end of the program. Only 10% of the participants prior to attending the program were aware that there were educational opportunities available in the animal and food sciences industries at NCSU. A pre- and post test was also given to the participants and the beginning and end of the program. The test average at the entry level was only 25% while the exit test average was 85%, indicating that knowledge had indeed been gained.

Distance Education

The food safety website (http://www.ces.ncsu.edu/depts/foodsci/agentinfo/) developed by the Department of Food Science has continued to receive the "Among the Best" ranking by Tufts University which evaluates food and nutrition related websites quarterly. This system has received over 512,000 hits in the last eight months and receives an average of 2,500 visitors per day. One evaluation of the sites effectiveness occurred when NC's coast was hit with a hurricane in late August of 1998. The site received over 41,000 hits in one day as people were visiting to learn more about food safety during and after a hurricane.

Train the Trainer

The group of 12 agents participating in the food safety resource agent pilot project completed their second and final year of the training program. The program was a two year in- depth training program which involved classroom education, group and individual projects, participating in national meeting that are not a normal part of their annual professional development, etc. Several of the agents indicated on their program evaluation that this was the best training their had ever received. It gave them added confidence and understanding of the "whys" behind the answers to their food safety questions.

NCCES began a four part food safety update series for 21 agents. Each of the four 3-hour training sessions will be conducted via MCNC. The first training was held in 1998 and the remaining three sessions will be held in 1999.

A bi-monthly newsletter (The Food Safety Communicator) was created in January to communicate food safety happenings to county agents. This has been an extremely effective communication tool and is very popular among agents. New programs and materials are announced, as well as useful food safety web sites and other information that this audience might not have been aware of . An agent is featured in a special "spotlight"in each issue. This column may be the only time an agent gets recognized for their unique programs and contributions. It is a good way to motivate other agents and to share programming ideas as well. The newsletter is also a great way for the extension specialists to interact with the agents and keep them abreast of hot topics in food safety and other pertinent information.

HACCP

A total of 18 HACCP workshops were conducted for a total of 521 participants. These HACCP workshops covered seafood, red meat, poultry and general food products. Several of these workshops were conducted in conjunction with other agencies and organizations.

SUCCESS STORIES
ServSafe Training Programs--Orange County Example

An 18 hour ServSafe Certification course for managers was held in Orange County in conjunction with Durham County, with 37 attending (18 from Orange). 35 passed the certification exam with an average score of 89. Managers reported that they had made changes after the training: they will no longer serve raw oysters, they have revamped recipes to include more critical control points, have passed out food safety information at staff meetings, showed the cook and prep man how to take temperatures, are now checking food on delivery, and plan to evaluate their procedures and make corrections and to start employee training. A 6 hour employee training was held with 42 people attending (41 from Orange). The average number correct on a pre-test was 15, and the average on the post-test was 17.26. Employees reported learning about temperature, heating and cooling, and storing in smaller containers.

Cutting Edge Distance Education

The food safety website (http://www.ces.ncsu.edu/depts/foodsci/agentinfo/) developed by the Department of Food Science has continued to receive the "Among the Best" ranking by Tufts University which evaluates food and nutrition related websites quarterly. This system has received over 512,000 hits in the last eight months and receives an average of 2,500 visitors per day. One evaluation of the sites effectiveness occurred when NC's coast was hit with a hurricane in late August of 1998. The site received over 41,000 hits in one day as people were visiting to learn more about food safety during and after a hurricane.

Target Food Safety

Twenty-one seniors at a congregate nutrition site in Pasquotank County participated in a Target Food Safety Training. The average age of the seniors was 72 years old. The seniors participated in eight lessons that were part of the Food Safety Pilot program. While about half of the seniors could not read they all stated an increased knowledge of food safety. As a result, 80 percent of the seniors said they would try to store food in smaller containers, refrigerate food promptly and discard old food.

Cloverbud Camp Handwashing Program

Seventy children between the ages of 5 and 16 at a two day Cloverbud Camp were given information as to the importance of hygiene in handling foods and in the difference frequent hand washing can make in their general health. Participants were able to discuss these topics and showed their understanding by out observation that 90 percent increased their hand washing before meals and after using the restroom while at camp.

Seafood Safety: Keep It Safe From Purchasing to Serving

A gap was noted in educational materails directed to seafood preparers and servers. That was the situation which prompted Pender County Extension Service and Environmental Health Department to apply in January 1996 for a $25,875 grant from the North Carolina Marine Fisheries to produce a training program for restaurant managers and workers. The purpose of the project

Focusing on the issue of seafood safety education was to develop a structured, comprehensive 8 hour training program for restaurant employees conductd by the CES and the local Environmental Health Department in each county. After two years and many people assisting in intense planning, committees, researching, writing and reviewing the manual and video are now available.

Food Safety Training for Hospitals

In an attempt to keep food service employees abreast of safe food handling practices, the Family and Consumer Educator collaborated with the food service supervisor at a local hospital to offer food safety training. Lessons taught included personal hygiene; using thermometers and keeping temperature logs; receiving and storing food safely; preparing and serving safe food; and cleaning and sanitizing. When asked what did you like most about the program, the supervisor stated, "the manner in which demonstrations were performed such as handwashing, thermometer calibaration, and sanitizing demonstrtions." The supervisor also mentioned she had noticed at least 15 employees that now use a thermometer and keep a temperature log as well as demonstrate safe food handling practices.

OBJECTIVES, PERFORMANCE GOALS, AND INDICATORS

OBJECTIVE 1

To improve food safety by controlling or eliminating food-borne risks.

PERFORMANCE GOAL 1

To annually increase consumer awareness, understanding, and information regarding food safety and food borne risks and illnesses in which CSREES partners and cooperators play an active extension role, in Category 1: Food Handler Training, Category 2: HACCP Training Using Current Materials, and/or Category 3: Model HACCP Training Programs for Fruits and Vegetables/Others.

INDICATOR 1

The total state and local funds used for the Food Safety and Quality Program(s).

Year	# in Category 1 Food Handler		# in Category 2 HACCP Training		# in Category Model HACCP Trai	
Baseline	260000		5000		0	
	Target	Actual	Target	Actual	Target	Actu
1998	260000	26000	0	0	0	
1999	260000	0	0	0	0	
2000	260000	0	0	0	0	
2001	260000	0	0	0	0	

DATA COLLECTION METHODOLOGY

North Carolina Extension Reporting System. Compilation of data reported by county extension agents.

INDICATOR 2

The total number of FTEs.

Year	# in Category 1	# in Category 2	# in Category

	Food Handler		HACCP Training		Model HACCP Trai	
Baseline	7		1		0	
	Target	Actual	Target	Actual	Target	Actu
1998	8	8	1	1	0	
1999	8	0	1	0	0	
2000	8	0	1	0	0	
2001	8	0	1	0	0	

DATA COLLECTION METHODOLOGY
Data is from administrative estimates

INDICATOR 3
The total number of volunteer hours used for the Food Safety and Quality Program(s).

Year	# in Category 1 Food Handler		# in Category 2 HACCP Training		# in Category Model HACCP Trai	
Baseline	5267		0		0	
	Target	Actual	Target	Actual	Target	Actu
1998	5300	12675	0	0	0	
1999	5300	0	0	0	0	
2000	5300	0	0	0	0	
2001	5300	0	0	0	0	

DATA COLLECTION METHODOLOGY
North Carolina Extension Reporting System. Compilation of data reported from county extension agents.

INDICATOR 4
The total number of Food Safety and Quality programs offered.

Year	# in Category 1 Food Handler		# in Category 2 HACCP Training		# in Category Model HACCP Trai	
Baseline	0		0		0	
	Target	Actual	Target	Actual	Target	Actu
1998	0	0	0	0	0	
1999	0	0	0	0	0	
2000	0	0	0	0	0	
2001	0	0	0	0	0	

DATA COLLECTION METHODOLOGY

Baseline data is unavailable, but future data will be collected from the North Carolina Extension Reporting System. A compilation of data reported from county extension agents.

INDICATOR 5
The total number of counties with Food Safety and Quality programs offered in your state.

Year	# in Category 1 Food Handler		# in Category 2 HACCP Training		# in Category Model HACCP Trai	
Baseline	32		0		0	
	Target	Actual	Target	Actual	Target	Actu
1998	35	39	0	0	0	
1999	38	0	0	0	0	
2000	40	0	0	0	0	
2001	42	0	0	0	0	

DATA COLLECTION METHODOLOGY
Data compiled from specialists supervising food handler programs.

INDICATOR 6
The total number of OTHER States adopting the Food Safety and Quality program(s) developed by your State.

Year	# in Category 1 Food Handler		# in Category 2 HACCP Training		# in Category Model HACCP Trai	
Baseline	0		0		0	
	Target	Actual	Target	Actual	Target	Actu
1998	0	0	0	0	0	
1999	0	0	0	0	0	
2000	0	0	0	0	0	
2001	0	0	0	0	0	

DATA COLLECTION METHODOLOGY

INDICATOR 7
The total number of Food Safety and Quality program participants.

Year	# in Category 1 Food Handler		# in Category 2 HACCP Training		# in Category Model HACCP Trai	
Baseline	0		0		0	
	Target	Actual	Target	Actual	Target	Actu
1998	0	0	0	0	0	

1999	0	0	0	0	0	
2000	0	0	0	0	0	
2001	0	0	0	0	0	

DATA COLLECTION METHODOLOGY
Baseline data is unavailable, but future data will be collected from the North Carolina Reporting System, a compilation of data reported county extension agents.

INDICATOR 8
The total number of food handler certification programs offered.

Year	# in Category 1 Food Handler		# in Category 2 HACCP Training		# in Category Model HACCP Trai	
Baseline	16		24		0	
	Target	Actual	Target	Actual	Target	Actu
1998	20	24	11	18	0	
1999	20	0	5	0	0	
2000	20	0	2	0	0	
2001	20	0	2	0	0	

DATA COLLECTION METHODOLOGY
1997 data used for baseline. Compilation of data from specialists supervising food handler programs.

INDICATOR 9
The total number of trained food handlers.

Year	# in Category 1 Food Handler		# in Category 2 HACCP Training		# in Category Model HACCP Trai	
Baseline	600		1000		0	
	Target	Actual	Target	Actual	Target	Actu
1998	600	869	500	846	0	
1999	600	0	200	0	0	
2000	600	0	200	0	0	
2001	600	0	200	0	0	

DATA COLLECTION METHODOLOGY
1997 data is reported as baseline. Baseline and future data collected from specialists supervising food handler programs.

INDICATOR 10
The total number of trained food service inspectors.

Year	# in Category 1 Food Handler		# in Category 2 HACCP Training		# in Category Model HACCP Trai	
Baseline	80		0		0	
	Target	Actual	Target	Actual	Target	Actu
1998	80	120	0	0	0	
1999	80	0	0	0	0	
2000	80	0	0	0	0	
2001	80	0	0	0	0	

DATA COLLECTION METHODOLOGY
Data collected from specialist supervising program.

INDICATOR 11
The total number of trained trainers.

Year	# in Category 1 Food Handler		# in Category 2 HACCP Training		# in Category Model HACCP Trai	
Baseline	60		175		0	
	Target	Actual	Target	Actual	Target	Actu
1998	60	93	100	521	0	
1999	60	0	50	0	0	
2000	60	0	20	0	0	
2001	60	0	20	0	0	

DATA COLLECTION METHODOLOGY
Data collected from specialists supervising programs.

INDICATOR 12
The total number of trained volunteers.

Year	# in Category 1 Food Handler		# in Category 2 HACCP Training		# in Category Model HACCP Trai	
Baseline	635		0		0	
	Target	Actual	Target	Actual	Target	Actu
1998	640	879	0	0	0	
1999	640	0	0	0	0	
2000	640	0	0	0	0	
2001	640	0	0	0	0	

DATA COLLECTION METHODOLOGY
North Carolina Extension Reporting System. A compilation of data reported by county extension agents.

INDICATOR 13
The total number of participants who plan to adopt one or more recommended food handling practices after completing one or more programs.

Year	# in Category 1 Food Handler		# in Category 2 HACCP Training		# in Category Model HACCP Trai	
Baseline	0		0		0	
	Target	Actual	Target	Actual	Target	Actu
1998	0	0	0	0	0	
1999	0	0	0	0	0	
2000	0	0	0	0	0	
2001	0	0	0	0	0	

DATA COLLECTION METHODOLOGY

INDICATOR 14
The total number of participants who actually adopt one or more recommended food handling practices after completing one or more programs.

Year	# in Category 1 Food Handler		# in Category 2 HACCP Training		# in Category Model HACCP Trai	
Baseline	40643		1000		0	
	Target	Actual	Target	Actual	Target	Actu
1998	41000	46666	500	521	0	
1999	41000	0	200	0	0	
2000	41000	0	200	0	0	
2001	41000	0	200	0	0	

DATA COLLECTION METHODOLOGY
North Carolina Extension Reporting System. Compilation of data from county extension agents and specialists supervising food handler programs.

INDICATOR 15
The total number of reported incidences of food-borne illnesses per 1000 State population.

Year	# of reported incidences per 1000	
Baseline	0	
	Target	Actual
1998	0	0

1999	0	0
2000	0	0
2001	0	0

DATA COLLECTION METHODOLOGY

PROGRAM COST

Extension

Year	Federal	State	Local	Other
1998	0	0	0	0
1999	0	0	0	0
2000	0	0	0	0
2001	0	0	0	0

FTE COMMITMENT

Extension FTEs

Year	Professional			Paraprofessional		
	1862	1890	Other	1862	1890	Other
1998	0.0	0.0	0.0	0.0	0.0	0.0
1999	0.0	0.0	0.0	0.0	0.0	0.0
2000	0.0	0.0	0.0	0.0	0.0	0.0
2001	0.0	0.0	0.0	0.0	0.0	0.0

VOLUNTEER PARTICIPATION

Extension

Year	# of Volunteers
1998	0
1999	0
2000	0
2001	0

ADDITIONAL COMMENTS

PROGRAM CONTACTS

Patricia A. Curtis (Prog)
Associate Professor & Extension Spec.
Department of Food Science
North Carolina State University
Box 7624
Raleigh, NC 27695-7624
Voice phone: 919/515/9514
Fax phone : 919/515/7124
Electronic mail: Pat_Curtis@ncsu.edu

NORTH CAROLINA 1998 ANNUAL REPORT:
PESTICIDE IMPACT ASSESSMENT - SMITH-LEVER 3D FUNDED ITEM

GOAL ACCOMPLISHMENT NARRATIVE
1. Crop Profiles for North Carolina Agriculture Initiated

As a result of concern from growers and commodity organizations in the state, the Commissioner of Agriculture in North Carolina requested that the College of Agriculture and Life Sciences (CALS) at North Carolina State University assist the Pesticide Section of the North Carolina Department of Agriculture and Consumer Services (NCDA&CS) "by reviewing all agricultural, structural and public health uses of organophosphate compounds and identifying those that are critical for agriculture and consumer protection in North Carolina." The CALS Agricultural Chemicals Policy Advisory Committee subsequently formed a FQPA committee to work with the NCDA&CS Pesticide Section to identify critical uses of organophosphate and carbamate pesticides in the state. As a mechanism to identify critical organophosphate and carbamate uses, the FQPA committee was charged with developing crop profiles for important agricultural commodities in North Carolina.

On June 5, 1998, the FQPA committee met to select the commodities for which crop profiles would be developed and outline a schedule for completion and publication of the crop profiles. For each commodity selected by the FQPA committee, a CALS scientist was assigned to serve as a commodity committee chair. The responsibilities of the commodity committee chairs included selecting and assembling individuals (CALS scientists, NCDA&CS personnel, representatives from commodity groups, etc.) to develop crop profiles for the respective commodities and submitting the completed profiles to the FQPA committee. A schedule for completing the crop profiles was approved by the FQPA committee at the June 5 meeting. The schedule contained the following timetables: 1) June 15-26, 1998 for commodity chairs to assemble their committees and schedule to first meeting; 2) August 15, 1998 for the completion of draft copies of the crop profiles; 3) August 15-31, 1998 for commodity committee chairs to send draft copies of the crop profiles to interested parties for review; 4) August 31 - September 4, 1998 for commodity committees to meet and make final changes in the crop profiles; 5) September 8, 1998 for the completion of the final drafts of the crop profiles; and 6) September 8-30, 1998 for editing and formatting the crop profiles for publication by personnel of the Pesticide Impact Assessment Program at North Carolina State University and the NCDA&CS.

Agricultural commodities for which crop profiles were developed include the following: apples, blueberries, Christmas trees, cole crops, corn and sorghum (grain), cotton, cucumbers (fresh and processing), grapes, ornamentals (nursery and greenhouse), peaches, peanuts, pecans, peppers, potatoes, poultry (broilers, layers and turkeys), public health, residences and structures, small grains (rye, winter wheat and barley), soybeans, strawberries, sweet corn, sweetpotatoes, swine and cattle, tobacco (flue-cured and burley), tomatoes, turf and watermelons.

Personnel of the Pesticide Impact Assessment Program at North Carolina State University supported and assisted the commodity committees by providing data on pesticide usage and pest management available from grower surveys conducted in the state by the Pesticide Impact Assessment Program and additional sources (e.g., National Agricultural Statistics Service). Production statistics for the selected agricultural commodities was provided to the commodity committees by personnel from the NCDA&CS. North Carolina Pesticide Impact Assessment Program personnel will prepare completed crop profiles for publication and subsequent dissemination published crop profiles to interested parties (including posting of these crop profiles on the North Carolina Pesticide Impact Assessment Program web site at: http://ipmwww.ncsu.edu/ncpiap/).

2. Crop Profile Database Developed

As a part of a NAPIAP-funded project, a searchable database of crop profiles for agricultural commodities in the all of the U. S. states and territories has been developed by the North Carolina Pesticide Impact Assessment Program in conjunction with the Center for Integrated Pest Management at North Carolina State University. Crop profiles submitted to the USDA's Office of Pest Management Policy will be forwarded to the North Carolina Pesticide Impact Assessment Program for formatting and inclusion in the database. The crop profile database is available on the World Wide Web at: http://pestdata.ncsu.edu/CropProfiles/.

3. Pesticide Data Submitted to the NAPIAP

Kenneth A. Sorensen, Extension Entomologist, North Carolina State University, served as the chairman of the NAPIAP Strawberry Pesticide Assessment Team, which published a 244-page report, "The Importance of Pesticides and Other Pest Management Practices in U. S. Strawberry Production" (Document Number 1-CA-97). Data on the use of pesticides and other pest management practices in sweetpotato production in 1996 and peanut production in 1995 were provided in reports submitted to the Southern Region Pesticide Impact Assessment Program and NAPIAP in December 1997 and March 1998, respectively.

4. Distribution of Pesticide Information

Information from the USDA NAPIAP Reregistration Notification Network was forwarded by mail to 89 commodity organizations and other interested persons within North Carolina. Extension and research personnel in North Carolina received the same information via a statewide extension electronic news network. Current and archived issues of the Reregistration Notification Network were provided on the World Wide Web via the USDA NAPIAP web site. The purpose of the Reregistration Notification Network is "to inform interested parties of recent or impending use cancellations and tolerance revocations." Interested persons and organizations are encouraged to respond to these regulatory actions.

The National Pesticide Information Retrieval System (NPIRS) and other pesticide databases were used routinely to provide extension and research personnel with current information on pesticide products registered with the United States

Environmental Protection Agency and the North Carolina Department of Agriculture.

More than twenty issues of the "North Carolina Pest News" was co-edited by the Extension Pesticide Impact Assessment Specialist. This newsletter is published on the statewide extension electronic news network every Friday from April until September and contains current information on the status of insect and disease pests in North Carolina. Articles for the "North Carolina Pest News" are provided each week by extension specialists in the Departments of Entomology and Plant Pathology at North Carolina State University. Current and past issues of the newsletter is available on the World Wide Web at: http://ipmwww.ncsu.edu/current_ipm/pest_news.html. In 1997, approximately 4,728 "hits" were made on this web site; 12,269 "hits" were made on subpages of the web site (i.e., articles on pest management on field and forage crops, fruit and vegetable crops, ornamental crops and turf, poultry and livestock, and residences and structures, and insect trap data).

5. World Wide Web Home Pages Maintained and Developed

As a part of a USDA/CSREES NAPIAP-funded project, a home page for NAPIAP (http://ipmwww.ncsu.edu/usdanapiap/) on the World Wide Web was developed, maintained and expanded. The NAPIAP home page has information on the history, organization, strategic plan, federal, regional and state personnel, pesticide/commodity assessments, and publications of NAPIAP (including the Reregistration Notification Network). The home page also contains links to the home pages of pesticide impact assessment programs in a number of states. The estimated number of "hits" on the NAPIAP home page from October 1, 1997 to September 30, 1998 was 2,148.

A home page for the North Carolina Pesticide Impact Assessment Program (http://ipmwww.ncsu.edu/ncpiap/) on the World Wide Web was maintained and expanded. The North Carolina Pesticide Impact Assessment Program home page contains information on the program's purpose, personnel, objectives, activities, projects, publications, and presentations. The home page also has links to additional sites which contain useful information on pesticides. The estimated number of "hits" on the home page from October 1, 1997 to September 30, 1998 was 2,285.

6. Publications and Presentations

Toth, S. J., Jr. 1997. Pest Management in Vegetable Production and Regulation of Pesticides In H. P. Fleming and R. N. Costilow, eds. Acidified Foods - Principles of Handling and Preservation. Training Manual. North Carolina State University, Raleigh.

Toth, S. J., Jr. and R. L. Brandenburg. 1997. Insect management by North Carolina peanut growers in 1995. ENT/pia 7. Department of Entomology, North Carolina State University, Raleigh. 4 pp.

Toth, S. J., Jr. 1997. Electronic newsletters: distributing timely pest management information on the World-Wide Web. Entomological Society of America Annual Meeting, Nashville, Tennessee, December 17, 1997.

Toth, S. J., Jr. 1998. The NAPIAP web page. National Agricultural

Pesticide Impact Assessment Program Workshop, Sacramento, CA, May 6, 1998.

7. Grants Received

USDA/CSREES NAPIAP. Pesticide Impact Assessment Research and Extension in North Carolina. Ross B. Leidy and Stephen J. Toth, Jr. December 15, 1996 - December 31, 1998.
Abstract: The U. S. Department of Agriculture (USDA) established the National Agricultural Pesticide Impact Assessment Program (NAPIAP) in 1976 to provide accurate and objective data to evaluate benefits and risks of selected pesticides having critical agricultural and forestry uses. Data generated were provided to the U. S. Environmental Protection Agency's pesticide registration and Special Review processes. NAPIAP involves the USDA and land grant university personnel in preparing documents on the biological and economic benefits of pesticides and supports state programs through selected funding. The North Carolina Pesticide Impact Assessment Program will support federal pesticide registrations important to the state agriculture through the collection of pesticide use data, notify the commodity and grower groups on actions which might impact, adversely, on their respective crops, inform state clientele and university scientists with NAPIAP-generated information and develop procedures to assess pesticide use in North Carolina. In addition, university scientists will be notified when NAPIAP research proposals become available and the potential to serve on NAPIAP Assessment Activity Teams.

USDA/CSREES NAPIAP. Purchase, production, and distribution of pesticide-related educational materials. Stephen J. Toth, Jr. September 6, 1996 - August 31, 1999.
Abstract: The purpose of this project is to support the educational role of the National Agricultural Pesticide Impact Assessment Program (NAPIAP) by providing NAPIAP State Liaison Representatives educational materials (printed and electronic) relating to pesticides. Educational materials designated by the USDA Cooperative State Research, Education and Extension Service NAPIAP Program Leader will be purchased or produced at North Carolina State University and distributed to NAPIAP personnel in the states and territories.

USDA/ARS NAPIAP. Development of a World Wide Web home page and selected publications for the National Agricultural Pesticide Impact Assessment Program. Stephen J. Toth, Jr. September 27, 1996 - September 30, 1999.
Abstract: The purpose of this project is to maintain and further develop a home page for the National Agricultural Pesticide Impact Assessment Program (NAPIAP) on the World Wide Web to continue to meet the informational needs of the program's clientele. New developments for the NAPIAP home page will include a searchable database of crop profiles prepared by the state and/or regional pesticide impact assessment programs in response to regulatory changes resulting from the Food Quality Protection Act of 1996. Information from crop profiles will be submitted in electronic form to the principle investigators for inclusion in the database. The principle investigators will coordinate these activities with the USDA's Office of Pest Management Policy and federal, regional and state NAPIAP personnel.

Southern Region Pesticide Impact Assessment Program (University of Florida). Poultry Pesticide Use Survey in North Carolina. Stephen J. Toth, Jr. June 1, 1998 - May 31, 1999.
Abstract: The purpose of this project is to gather data on pesticide use in poultry production in North Carolina. These data will be used to identify critical usages of pesticides in poultry production in the North Carolina and facilitate informed regulatory decisions on the registrations of these critical pesticide usages. In the fall of 1998, a mail survey of North Carolina poultry producers will be conducted. The survey questionnaire will be developed by North Carolina Cooperative Extension Service specialists at North Carolina State University. The principle investigator will assume a leadership role in developing a questionnaire that will be used in North Carolina and other states conducting surveys of poultry producers in 1998. Information provided on survey questionnaires completed and returned by poultry producers in North Carolina will be compiled and analyzed at North Carolina State University. Survey results will be included in a final report submitted by June 30, 1999.

Southern Region Pesticide Impact Assessment Program (University of Florida). Development of Crop Profiles for North Carolina Agriculture. Stephen J. Toth, Jr. August 1, 1998 - July 31, 1999.
Abstract: The Food Quality Protection Act of 1996 (FQPA) was designed to protect the U. S. public from unreasonable risks from dietary and non-dietary exposures to pesticides. The implications of the FQPA are the loss of the registrations or restrictions in the use of many pesticides important in managing pests, particularly organophosphate and carbamate pesticides. The purpose of this project is to support the development of crop profiles for use by USDA and EPA in implementing the FQPA. Extension and research scientists in the College of Agriculture and Life Sciences at North Carolina State University will prepare profiles for approximately 30 commodities produced in the state. These profiles will be reviewed by state agencies, commodity groups and other interested parties and published with project funds. Completed crop profiles will be submitted to the USDA's Office of Pest Management Policy.

8. Linkages Established and Maintained

The NAPIAP State Liaison Representative and Extension Pesticide Impact Assessment Specialist in North Carolina attended the Southern Extension and Research Activity - Information Exchange Group 1 (Pesticide Impact Assessment) annual meeting on October 1-2, 1997 in Athens, Georgia. Research and extension priorities for pesticide impact assessment in the Southern Region were discussed at the meeting. The Extension Pesticide Impact Assessment (PIA) Specialist also participated in the following meetings: 1) North Carolina Crop Protection Association Meeting, Raleigh, October 8, 1997; 2) North Carolina Department of Agriculture Pesticide Certification/Recertification Program Meeting, Raleigh, November 3, 1997; 3) Entomology Faculty/Staff Departmental Retreat, Fort Fisher, November 13-15, 1997; 4) Green Expo, Professional Lawn Care Association of America, Charlotte, November 17-18, 1997; 5) Annual Conference, North Carolina Cooperative Extension Service, Raleigh, November 19-21, 1997; 6) Entomological Society of America Annual Meeting, Nashville,

Tennessee, December 14-17, 1997; 7) North Carolina Crop Protection School, North Carolina State University, Raleigh, December 18, 1997; 8) North Carolina Pest Control School, Raleigh, January 13, 1998; 9) North Carolina Sweetpotato Commission Annual Meeting, Wilson, January 15, 1998; 10) Landscape Maintenance Workshop, Newton, January 22, 1998; 11) Food Quality Protection Workshop, St. Louis, Missouri, February 18-19, 1998; 12) NAPIAP Workshop, Sacramento, California, May 5-7, 1998; and 13) NAPIAP Government Performance and Results Act (GPRA) Workshop, Washington, DC, July 8-9, 1998. These meetings provided the opportunity for the Extension PIA Specialist to discuss pesticide impact assessment activities with the program's clientele and receive input on issues relating to pesticides and pest management. Finally, the Extension PIA Specialist served on the following committees at North Carolina State University: 1) Pesticide Education Advisory Committee; 2) Integrated Pest Management Committee; 3) Extension Vegetable Crops Coordinating Committee; and 4) Agricultural Chemicals Manual Editorial Committee.

SUCCESS STORIES

1. Crop Profiles for North Carolina Agriculture Initiated

As a result of concern from growers and commodity organizations in the state, the Commissioner of Agriculture in North Carolina requested that the College of Agriculture and Life Sciences (CALS) at North Carolina State University assist the Pesticide Section of the North Carolina Department of Agriculture and Consumer Services (NCDA&CS) "by reviewing all agricultural, structural and public health uses of organophosphate compounds and identifying those that are critical for agriculture and consumer protection in North Carolina." The CALS Agricultural Chemicals Policy Advisory Committee subsequently formed a FQPA committee to work with the NCDA&CS Pesticide Section to identify critical uses of organophosphate and carbamate pesticides in the state. As a mechanism to identify critical organophosphate and carbamate uses, the FQPA committee was charged with developing crop profiles for important agricultural commodities in North Carolina.

On June 5, 1998, the FQPA committee met to select the commodities for which crop profiles would be developed and outline a schedule for completion and publication of the crop profiles. For each commodity selected by the FQPA committee, a CALS scientist was assigned to serve as a commodity committee chair. The responsibilities of the commodity committee chairs included selecting and assembling individuals (CALS scientists, NCDA&CS personnel, representatives from commodity groups, etc.) to develop crop profiles for the respective commodities and submitting the completed profiles to the FQPA committee. A schedule for completing the crop profiles was approved by the FQPA committee at the June 5 meeting.

Agricultural commodities for which crop profiles were developed include the following: apples, blueberries, Christmas trees, cole crops, corn and sorghum (grain), cotton, cucumbers (fresh and processing), grapes, ornamentals (nursery and greenhouse), peaches, peanuts, pecans, peppers, potatoes, poultry (broilers, layers and turkeys), public health, residences and structures, small grains (rye, winter wheat and barley),

soybeans, strawberries, sweet corn, sweetpotatoes, swine and cattle, tobacco (flue-cured and burley), tomatoes, turf and watermelons.

Personnel of the Pesticide Impact Assessment Program at North Carolina State University supported and assisted the commodity committees by providing data on pesticide usage and pest management available from grower surveys conducted in the state by the Pesticide Impact Assessment Program and additional sources (e.g., National Agricultural Statistics Service). Production statistics for the selected agricultural commodities was provided to the commodity committees by personnel from the NCDA&CS. North Carolina Pesticide Impact Assessment Program personnel will prepare completed crop profiles for publication and subsequent disseminate published crop profiles to interested parties (including posting of these crop profiles on the North Carolina Pesticide Impact Assessment Program web site at: http://ipmwww.ncsu.edu/ncpiap/).

2. Crop Profile Database Developed

As a part of a NAPIAP-funded project, a searchable database of crop profiles for agricultural commodities in the all of the U. S. states and territories has been developed by the North Carolina Pesticide Impact Assessment Program in conjunction with the Center for Integrated Pest Management at North Carolina State University. Crop profiles submitted to the USDA's Office of Pest Management Policy will be forwarded to the North Carolina Pesticide Impact Assessment Program for formatting and inclusion in the database. The crop profile database is available on the World Wide Web at: http://pestdata.ncsu.edu/CropProfiles/.

OBJECTIVES, PERFORMANCE GOALS, AND INDICATORS

OBJECTIVE 1

To improve decision-making on public policy issues related to the productivity and global competitiveness of the U.S. agricultural production system.

PERFORMANCE GOAL 1

To annually increase the effectiveness of constituent and citizen participation on public policy issues affecting the productivity and global competitiveness of the U.S. agricultural production system.

INDICATOR 1

The number of new pest management registration related information requests for which your state Pesticide Impact Assessment (PIA) program provided data for on an annual basis.

Year	# of pest mgt. registr. requests
Baseline	0

	Target	Actual
1998	0	0
1999	0	0
2000	0	0

2001	0	0

DATA COLLECTION METHODOLOGY
The North Carolina Pesticide Impact Assessment Program does not receive requests for new pest management registrations.

INDICATOR 2
The number of new federal label registrations (section 3) for your state's producers granted this growing season, for which your program provided data.

Year	# of new section 3 registr. granted	
Baseline	0	
	Target	Actual
1998	0	0
1999	0	0
2000	0	0
2001	0	0

DATA COLLECTION METHODOLOGY
The Pesticide Impact Assessment Program in North Carolina does not directly provide data to registrants for Section 3 federal label registrations. If registrants use data generated by the North Carolina Pesticide Impact Assessment Program for this purpose, it can not be documented.

INDICATOR 3
The estimated dollar impact (dollars per acre change times the number of acres treated with new registered products) that resulted this season for your state's producers from the new registration, for which your PIA program provided data.

Year	Estimated dollar impact	
Baseline	0	
	Target	Actual
1998	0	0
1999	0	0
2000	0	0
2001	0	0

DATA COLLECTION METHODOLOGY
The Pesticide Impact Assessment Program in North Carolina does not directly provide data to registrants for Section 3 federal label registrations. If registrants use data generated by the

North Carolina Pesticide Impact Assessment Program for this purpose, it can not be documented. Thus, estimated dollar impacts can not be documented.

INDICATOR 4
The number of State emergency registrations (Section 18) submitted by your state, and those granted by EPA to your State, for which your PIA program provided data.

Year	# of section 18 submitted		# of Section 18 granted by EPA	
Baseline	0		0	
	Target	Actual	Target	Actual
1998	0	0	0	0
1999	0	0	0	0
2000	0	0	0	0
2001	0	0	0	0

DATA COLLECTION METHODOLOGY
The Pesticide Impact Assessment Program in North Carolina does not directly provide data for Section 18 emergency registrations in North Carolina. If data generated by the North Carolina Pesticide Impact Assessment Program is used for this purpose, it can not be documented.

INDICATOR 5
The total estimated dollar impact for your State producers (dollars per acre change times the number of acres treated with section 18 registered products) that resulted this last growing season from Section 18 registrations, for which your program provided data.

Year	Estimated dollar impact	
Baseline	0	
	Target	Actual
1998	0	0
1999	0	0
2000	0	0
2001	0	0

DATA COLLECTION METHODOLOGY
The Pesticide Impact Assessment Program in North Carolina does not directly provide data for Section 18 emergency registrations. If data generated by the North Carolina Pesticide Impact Assessment Program is used for this purpose, it can not be documented. Thus, estimated dollar impacts can not be documented.

INDICATOR 6
The total number of Special Local Needs 24(c) registrations submitted by your State, and the number granted by EPA to your State, for which your program provided data.

Year	# Spec. Local Needs 24(s) submitted		# Spec. Local Needs 24(c) granted	
Baseline	0		0	
	Target	Actual	Target	Actual
1998	0	0	0	0
1999	0	0	0	0
2000	0	0	0	0
2001	0	0	0	0

DATA COLLECTION METHODOLOGY
The Pesticide Impact Assessment Program in North Carolina does not directly provide data for Special Local Need 24(c) registrations submitted by the state. If data generated by the North Carolina Pesticide Impact Assessment Program is used for this purpose, it can not be documented.

INDICATOR 7
The total estimated dollar impact for your State producers (dollars per acre change times the number of acres treated with Section 18 registered products) that resulted this last growing season from Special Local Needs 24(c) registrations, for which your program provided data.

Year	Estimated dollar impact	
Baseline	0	
	Target	Actual
1998	0	0
1999	0	0
2000	0	0
2001	0	0

DATA COLLECTION METHODOLOGY
The Pesticide Impact Assessment Program in North Carolina does not directly provide data for Special Local Need 24(c) registrations submitted by the state. If data generated by the North Carolina Pesticide Impact Assessment Program for this purpose, it can not be documented. Thus, estimated dollar impacts can not be documented.

INDICATOR 8
The total number of interactions with commodity groups in which you identified, evaluated and/or recorded pest management related data to enhance your program's data acquisition, development, or dissemination capabilities.

Year	# of commodity group interactions
Baseline	12

	Target	Actual
1998	12	13
1999	12	0
2000	12	0
2001	12	0

DATA COLLECTION METHODOLOGY
The Extension Pesticide Impact Assessment Specialist regularly attends national, state and county-level commodity organization meetings. Attendance of these meetings allows the Extension PIA Specialist to remain informed of the production practices and pest management problems of the respective commodities, interact with commodity organization representatives, and inform these organizations of pesticide impact assessment activities conducted within the state. The Extension PIA Specialist also participates in university commodity overviews where industry representatives (growers, buyers, etc.) have the opportunity for input into the direction of research and Extension programs conducted by university scientists. The commodity overviews also provide an opportunity to educate industry representatives of the NAPIAP and pesticide impact assessment activities in North Carolina and gain insight into their pest management problems and needs. Finally, the Extension PIA Specialist works in cooperation with national and state IR-4 (Minor Use Pesticide Registration) and IPM (Integrated Pest Management) personnel to identify pest management problems in the state.

OBJECTIVE 2
To improve decision-making on public policies related to agriculture and the environment.

PERFORMANCE GOAL 1
To annually increase the effectiveness of constituent and citizen participation on public policy issues affecting agricultural production, the environment, and ecosystem integrity and biodiversity.

INDICATOR 1
The total number of events in which SLRs and growers interacted on public policy issues related to pesticide impact assessment on an annual basis.

Year	# of events SLRs & growers interacted
Baseline	12

	Target	Actual
1998	12	13
1999	12	0
2000	12	0
2001	12	0

DATA COLLECTION METHODOLOGY
The Extension Pesticide Impact Assessment Specialist regularly attends national, state and county-level events involving agricultural producers, agricultural consultants, pesticide applicators, pesticide dealers, county Extension agents, pesticide industry representatives, etc. Attendance at these events allows the Extension PIA Specialist to interact with and inform these individuals of public policy issues relating to pesticides, pest management, and environmental protection.

INDICATOR 2
The total number of public officials attending presentations of pesticide impact assessment on an annual basis, including state or national regulatory decision processes)

Year	# of public off. attending pres.
Baseline	1

	Target	Actual
1998	1	0
1999	1	0
2000	1	0
2001	1	0

DATA COLLECTION METHODOLOGY
The Extension Pesticide Impact Assessment Specialist occasionally attends meetings with public officials. Attendance at these meetings allows the Extension PIA Specialist to interact with and inform public officials of public policy issues relating to pesticides, pest management, and environmental protection.

INDICATOR 3
The total number of citizens attending presentations of pesticide impact assessment on an annual basis, including state or national regulatory decision processes.

Year	# of citizens attending pres.
Baseline	1

	Target	Actual
1998	1	0
1999	1	0
2000	1	0
2001	1	0

DATA COLLECTION METHODOLOGY
The Extension Pesticide Impact Assessment Specialist occasionally attends meetings with citizen groups. Attendance at these meetings allows the Extension PIA Specialist to interact with and inform citizens of public policy issues relating to pesticides, pest management, and environmental protection.

INDICATOR 4
The total number of data packets and responses to regulatory agencies developed annually by your State/Territory PIA program, and the number of these for use by PMIDSS.

Year	# of data packets developed		# of data packets for use by PMIDSS	
Baseline	13		0	
	Target	Actual	Target	Actual
1998	1	2	1	0
1999	1	0	1	0
2000	1	0	1	0
2001	1	0	1	0

DATA COLLECTION METHODOLOGY
Since 1988, the North Carolina Pesticide Impact Assessment Program through the North Carolina Cooperative Extension Service has conducted mail surveys of peanut, potato, tobacco, cucumber, apple, sweetpotato, cotton, tomato, poultry, and Christmas tree producers in North Carolina to detrmine pesticide use and benefits of these commodities. Data collected through these surveys include acres treated, number of applications, application rates, application costs, method of application, and effects of pest management on crop yield and quality for pesticides and other pest management alternatives. These data are maintained in a database and reports containing the data are submitted to the NAPIAP. Surveys conducted more than five years ago are repeated and whenever possible surveys for additional commodities are conducted and the data added to the database. A producer survey is conducted for a minimum of one commodity each year. Data collected from each producer survey (a data packet) are reported to the NAPIAP.

INDICATOR 5
Of the States/Territories with home pages on the World Wide Web (WWW), indicate whether your State has

published pesticide usage data packages for grower groups and decision makers on the WWW.

Year	Published data packages on WWW?
Baseline	N

	Target	Actual
1998	Y	Y
1999	Y	N
2000	Y	N
2001	Y	N

DATA COLLECTION METHODOLOGY
Pesticide usage data packets for North Carolina agricultural commodities will be published on the World Wide Web using computer programs developed by NAPIAP or in the state.

INDICATOR 6
Of the States/Territories with home pages on the WWW, indicate the total number of user hits on your home page on an annual basis.

Year	# of hits on WWW home page
Baseline	0

	Target	Actual
1998	0	2285
1999	2000	0
2000	2000	0
2001	2000	0

DATA COLLECTION METHODOLOGY
The North Carolina Pesticide Impact Assessment Program maintains a home page on the World Wide Web (WWW). Information provided through the home page includes information on program personnel, objectives, activities, projects, publications and presentations, and contains links to many pesticide-related sites on the WWW. The number of hits on the North Carolina Pesticide Impact Assessment Program home page are recorded on the server on which it resides. The home page is located at "http://ipmwww.ncsu.edu/ncpiap/".

OTHER STATE/TERRITORY INDICATORS
1998 ACTUAL RESULT(S)

PROGRAM COST

Extension

Year	Federal	State	Local	Other
1998	89000	7000	8000	0
1999	0	0	0	0
2000	0	0	0	0
2001	0	0	0	0

FTE COMMITMENT

Extension FTEs

Year	Professional			Paraprofessional		
	1862	1890	Other	1862	1890	Other
1998	1.5	0.0	0.0	1.0	0.0	0.0
1999	0.0	0.0	0.0	0.0	0.0	0.0
2000	0.0	0.0	0.0	0.0	0.0	0.0
2001	0.0	0.0	0.0	0.0	0.0	0.0

VOLUNTEER PARTICIPATION

Extension

Year	# of Volunteers
1998	0
1999	0
2000	0
2001	0

ADDITIONAL COMMENTS

PROGRAM CONTACTS

Stephen Joseph Toth, Jr. (Prog, Data)
Extension Specialist
Department of Entomology
North Carolina State University
Box 7613
Raleigh, NC 27695-7613
Voice phone: 919-515-8879
Fax phone : 919-515-7746

Electronic mail: Steve_Toth@ncsu.edu