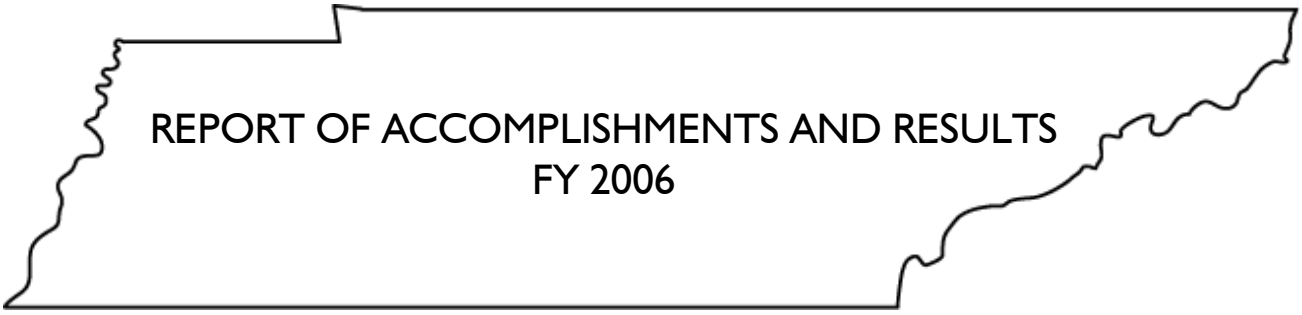
TENNESSEE AGRICULTURAL RESEARCH AND EXTENSION SYSTEM



REPORT OF ACCOMPLISHMENTS AND RESULTS FY 2006

The University of Tennessee Extension

The University of Tennessee Agricultural Experiment Station

and

Tennessee State University Cooperative Extension Program

Submitted to:

United States Department of Agriculture

Cooperative State Research, Education, and Extension Service

April 1, 2007

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I. Introduction

Tennessee's two land-grant universities comprise the Tennessee Agricultural Research and Extension System, conducting Research and Extension programs in all 95 counties, serving the state's 5.9 million people. The University of Tennessee Extension and the University of Tennessee Agricultural Experiment Station comprise the 1862 institution and the Tennessee State University Cooperative Extension Program (TSU Extension) and the Tennessee State University Institute for Agricultural and Environmental Research comprise the 1890 institution. This FY 2006 Report of Accomplishments and Results represents the combined efforts of the University of Tennessee Extension, the University of Tennessee Agricultural Experiment Station, and the Tennessee State University Cooperative Extension Program. The Tennessee State University Institute for Agricultural and Environmental Research will respond in a separate report. This report includes results and accomplishments of FY 2006 planned programs, stakeholder input, program review, multistate, and integrated research and extension activities.

II. Certification

Our signatures certify that this is the USDA-CSREES Annual Report of Accomplishments and Results for FY 2006 for the University of Tennessee Extension, the University of Tennessee Agricultural Experiment Station, and the Tennessee State University Cooperative Extension Program of the Tennessee Agricultural Research and Extension System.

Dr. Joseph A. DiPietro
Vice President for Agriculture
The University of Tennessee

Dr. H. Charles Goan
Interim Dean
The University of Tennessee
Extension

Dr. Clyde E. Chesney
Administrator
Tennessee State University
Cooperative Extension Program

Dr. Thomas H. Klindt
Interim Dean
The University of Tennessee
Agricultural Experiment Station

III. Planned Programs

This report represents the performance goals established in the FY 2005-2006 Plan of Work submitted to USDA-CSREES on April 1, 2004. The FY 2005-2006 Plan of Work was an update and extension of the FY 2000-2004 Plan of Work submitted to USDA-CSREES on July 15, 1999. In addition, this report represents the research and education needs identified through extensive stakeholder input conducted since submission of the FY 2005-2006 Plan of Work.

The results and accomplishments from Tennessee's FY 2006 Extension and Research planned programs have been organized by the five USDA-CSREES National Goals. A brief overview of our work in each National Goal includes highlights, outcomes and resource allocations. Planned programs are delineated by key themes. Key themes are organized by six-part impact statements:

- title;
- issue or need present (issue);
- response to the issue or need (what has been done);
- outcomes of the Research and Extension responses (impacts);
- funding source(s); and
- scope of impact (state specific, multistate and/or integrated).

Goal 1 – An Agricultural System that is Highly Competitive in the Global Economy

1.0 Overview

1a. Results

UT and TSU Extension made 651,009 direct contacts in Goal One programs including horse nutrition, green industry profitability, row crop production, and beef marketing. UT Extension continued its statewide programs in beef nutrition and forage management, including hay storage demonstrations, pasture improvement meetings, and Master Beef Producer programs.

1b. Highlights

Losses to yield in Tennessee fruit and vegetable production in recent years have tended to come from high-impact, whole-field disease outbreaks. Educational programs with over 3,000 contacts have alerted growers to possible impending outbreaks of certain diseases and control measures.

To identify production challenges, TSU Extension conducted county, regional and statewide meetings with goat producers. The major outcome of the survey was establishment of the Master Meat Goat Producer program. UT Extension conducted 77 group meetings for goat producers in goat health and management reaching 2,079 contacts.

In 50 Tennessee counties, UT Extension targeted small-scale beef producers for education in nutrition and forage management. Extension agents and specialists conducted 183 group meetings and demonstrations for 5,944 contacts; 134 newspaper articles and 51 radio programs were used to promote local demonstrations and to reinforce management practices. Extension agents conducted beef nutrition and forage management follow-up through 1,133 farm visits to these producers.

1c. Benefits

Crop losses to cucurbit downy mildew in pumpkin and other cucurbit crops in 2006 were less than 5% of those in 2005. Certain other states experienced severe losses to this fungus, which is spread by spores that travel great distances on air currents. Losses to Phytophthora blight of cucurbits, peppers, and tomatoes were 70% of those in 2005.

The Master Meat Goat Producer program was evaluated through agent observation in Anderson and McNairy Counties. Outcomes included 25 goat producers who improved their knowledge about genetic improvement, nutrition and health. Also, 20 goat producers had production efficiency due to practices implemented from their Master Goat Producer participation.

In Lewis, Williamson, and Moore Counties, agent observation and interviews with small-scale beef producers were used to document 116 producers who adopted recommended hay storage methods to reduce hay dry matter losses on 9,069 round bales of grass hay, saving $108,828 this year. Tall fescue toxicosis continues to be the number one, grass-related disease in the U.S. in terms of economic loss to animal producers, affecting over 8.5 million beef cows and 700,000 horses. Tennessee beef cattle losses due to tall fescue toxicosis are over $100 million annually. Tennessee Agricultural Experiment Station research has resulted in management strategies to reduce fescue toxicosis. These management strategies save the Tennessee beef cattle industry $40 to $50 million annually. The value of this research to the U.S. beef cattle industry would be $260 to $325 million annually.

UT researchers continue to refine weed control systems that increase yields, reduce labor, retain soil, and cut fuel usage – helping maintain our global competitiveness. As long as farmers can control weeds, they are able to use no-till systems in some situations. While farmers develop their best practices from a variety of sources, if Tennessee Agricultural Experiment Station research is responsible for as much as 30% of labor savings, at $7 per hour, over 3.2 million acres of crops, current annual savings equals about $8.7 million in Tennessee.

1d. Assessment of Accomplishments

A special accomplishment of Goal One programs was the scope of Extension programs that addressed multistate concerns and the scope of integrated Research and Extension programs. Integrated programs included dairy production, row crop variety testing, irrigation and turfgrass. Multistate Extension programs addressing Goal One were conducted with Extension personnel from 12 states.

1e. Allocations for Goal 1

UT 1862 Research – $18,136,477 • Hatch – $2,388,825 • Multistate 3(c) 3 – $552,456 • McIntire-Stennis – $84,899 • State – $15,110,297	**FTEs for Goal 1 – 453.76** • UT 1862 Research – 312.0 (48.8 scientist and 263.2 non-scientist) • UT 1862 Extension – 133.3 • TSU 1890 Extension – 8.46 (6.91 professional and 1.95 para-professional)
UT 1862 Extension – $10,532,192 • Smith-Lever b and c – $1,997,086 • State/County – $8,535,106	**TSU 1890 Extension – $650,102** • NARETPA Section 1444 and 1445 – $571,663 • State/County – $ 78,439

1.1 Key Theme: Agricultural Competitiveness (Value-Added, Marketing and Management)

Title: Extension's Agritourism Program

Issue: Agritourism is an opportunity for some Tennessee farmers and agri-entrepreneurs to add value to farm resources. A 2005 study estimated for every dollar spent by customers at an agritourism enterprise an additional $0.85 in economic activity is generated through multiplier effects. Impact by this industry may be increased through educational programming for agritourism entrepreneurs and farmers interested in agritourism.

What has been done: Efforts in agritourism included development and delivery of educational programs and individual consultations with agritourism operators. UT Extension created five issues of a new electronic newsletter called *Tennessee Agritourism Today*. These were developed and distributed to 400 individual contacts via e-mail. Nine educational workshops were conducted for 199 contacts. In addition, more than 50 individual consultations were provided to agritourism entrepreneurs.

Impact: An on-line evaluation was conducted of *Tennessee Agritourism Today* newsletter recipients. Of the 63 respondents to the survey, almost three quarters of respondents increased their awareness of agritourism as an opportunity to add value to farm resources through the newsletter. More than one third of respondents gained knowledge or skills to manage risk, and 12% gained knowledge or skills to improve financial returns from their existing operation.

Producer project work also contributed to impacts. One enterprise receiving significant project assistance more than doubled its estimated visitors from 10,000 in 2005 to 21,000 in 2006. The operation also made revenue gains through increased admission prices and the addition of an on-farm retail market. In the first six weeks one new enterprise was open to the public, approximately 3,500 people paid admission and eight people were employed.

Funding: Smith-Lever

Scope: State-specific

Title: Marketing Alternatives for Tennessee Row Crop Farmers

Issue: Marketing is an important component in determining farmers' profitability levels. This educational effort allowed us to teach marketing concepts that would reduce risk and increase the farmers' ability to market crops using a more profitable plan.

What has been done: UT Extension developed educational programs in over 17 counties demonstrating that using historical data shows a positive financial impact for farmers who use marketing tools to price crops outside the harvest season. During 2006, 37 group meetings were

held on crops marketing, reaching 2,491 contacts. Over 9,000 contacts were made via direct mail or telephone calls. In total, 11,718 contacts were made in the row crops marketing and management educational program during 2006. Based on historical data, farmers can add, on the average, as much as $13 and $35 per acre to revenue for soybeans and corn, respectively by using forward pricing tools.

Impact: Agent observation, on-farm interviews and end-of-program questionnaires indicated these outcomes in nine Tennessee counties:

- 528 grain and fiber producers increased their crop marketing knowledge and decision making skills by learning about the current market situation and alternative marketing tools.
- 219 row crop producers developed marketing plans to price crops outside the seasonally low prices at harvest.
- 412 farmers implemented improved marketing practices and plans.
- 343 farmers increased their per unit price by utilizing improved marketing skills.

Funding: Smith-Lever

Scope: State-specific

Title: Training of Federal Income Tax Professionals

Issue: Federal income tax laws change frequently and they are quite complex. To properly prepare income tax returns, tax professionals need to receive updated information and training.

What has been done: In cooperation with Tennessee Farm Bureau and the Internal Revenue Service, UT Extension provided tax seminars in seven locations across Tennessee to train tax professionals who complete Federal income tax returns. The seminars are one day in length. A record attendance of 808 individuals participated in the 2006 seminars. Participation has increased 21% over the past four years. Many other states reported a decline in attendance for the same time period. Seminar participants prepared nearly 285,000 tax returns. They completed nearly one-half of the Federal farm tax returns in Tennessee.

Impact: A recent evaluation of the 808 participants of the seminars revealed that because of this seminar, participants estimate in a typical year that they save over $1,900 in total tax dollars per farm tax return.

Funding: Smith-Lever; Internal Revenue Service; Tennessee Farm Bureau; User Fees

Scope: State-specific

1.2 Key Theme: Agricultural Profitability (Forage, Livestock and Crops)

Title: Managing Fescue Toxicosis

Issue: Tall fescue toxicosis continues to be the number one, grass-related disease in the U.S. in terms of economic loss to animal producers, affecting over 8.5 million beef cows and 700,000 horses. Annual economic losses of $600 million to the U.S. cattle industry are probably an underestimate, covering both growth and reproduction. Tennessee beef cattle losses due to tall fescue toxicosis are over $100 million annually.

What has been done: Tennessee Agricultural Experiment Station research has resulted in management strategies to reduce fescue toxicosis.

Impact: These management strategies save the Tennessee beef cattle industry $40 to 50 million each year. The value of this research to the U.S. beef cattle industry would be $260 to $325 million each year.

Funding: Hatch; Smith-Lever

Scope: Integrated Research and Extension

Title: Beef Nutrition and Forage Management Targets Small-Scale Beef Producers

Issue: To realize greater profits, Tennessee's small-scale beef producers need to adopt recommended practices in nutrition and forage management, especially pasture management and efficient hay feeding.

What has been done: In 50 Tennessee counties, UT Extension targeted small-scale beef producers for education in nutrition and forage management. Extension agent and specialists conducted 183 group meetings and demonstrations for 5,944 contacts. UT Extension used 134 newspaper articles and 51 radio programs to promote the demonstrations and to reinforce management practices. Extension agents conducted follow-up through 1,133 farm visits.

Impact: In Lewis, Williamson, and Moore Counties, agent observation and interviews with producers were used to document these outcomes:

- 103 beef producers added feeding rings and improved hay feeding methods to reduce wastage/spoilage.
- 68 beef producers have improved knowledge about best management practices to protect and improve water quality.
- 56 beef producers have improved knowledge about efficient hay feeding, including use of hay rings and managed hay feeding.
- 54 beef producers have improved knowledge about planning and building hay storage structures, and 10 producers have built hay storage structures.

- 120 beef producers have improved knowledge of economic returns from improved pasture management (weed control, fertilization, renovation with clovers, stockpiling fescue, establishing native warm season grasses).
- 17 beef producers report improved returns due to utilizing soil testing, warm season grasses, renovation with clovers, stockpiling and/or native warm season grasses.
- 116 beef producers adopted recommended hay storage methods to reduce hay dry matter losses on 9,069 round bales of grass hay, saving $108,828 this year.

Funding: Smith-Lever

Scope: State-specific

Title: Master Meat Goat Producer

Issue: Meat goat numbers have been significantly increasing in Tennessee within the past five years as have various ethnic populations that consume goat meat. Goats are an environmentally adaptive, extremely opportunistic and afford small, limited resource landowners an alternative enterprise.

What has been done: To identify production challenges, TSU Extension conducted county, regional and statewide meetings with goat producers. Surveys were completed at each meeting giving those goat producers an opportunity to note their major goat production challenges. The data was used to prepare a brief titled "Status of the Tennessee Goat Industry". They also suggested organic meat production opportunities and more involvement with sheep production. Several Hair Sheep Field Days and a two-day Small Ruminant College were conducted. The major outcome of the survey was establishment of the Master Meat Goat Producer program. UT Extension conducted 77 group meetings for goat producers in goat health and management reaching 2,079 contacts. Farm visits, producer visits to the Extension Office, telephone calls, and direct mail to producers reached an additional 2,218 contacts.

Impact: The Master Meat Goat Producer program was evaluated through agent observation in Anderson and McNairy Counties. These outcomes were seen:

- 10 goat producers have implemented practices related to genetic improvement, nutrition, health, reproduction and other information.
- 25 goat producers have improved knowledge about genetic improvement, nutrition, health, reproduction and other information.

Funding: NARETPA Section 1444 and 1445; Smith-Lever; Tennessee Farmers Cooperative; City of Chattanooga

Scope: State-specific

Title: Master Beef Producer

Issue: Observations at markets and interviews with cattle industry leaders showed that Tennessee beef producers needed comprehensive knowledge to improve their beef cattle operations, including forage production, marketing and health.

What has been done: UT Extension started the Master Beef Producer program in 2004. The program has grown from 32 counties and 331 producers to 64 counties and 548 producers in 2006.

Impact: End-of program questionnaires were obtained from 331 producers in 2006 to secure producer feedback on the "value" of the program to their operation. They were asked if they planned to make any changes in their operations as result of what they learned from participating in the Master Beef Producer program:

- 87% indicated they would make changes in managing and planning.
- 81% in forage production.
- 75% in health practices.
- 71% in nutrition and feeding.
- 69% in genetics in their herds.

Producers were also asked to estimate the economic changes that would occur if they made changes in their operations as result of applying what they learned in the Master Beef Producer program, and 65% of the participants reported that the economic impact would range from $1,000 to $5,000.

Funding: Smith-Lever

Scope: State-specific

Title: Feeding is Fundamental

Issue: Tennessee livestock and horse producers, feed dealers and manufacturers and veterinarians need education in animal nutrition to improve animal health and profitability.

What has been done: Over 150 Tennessee livestock and horse producers, feed dealers and manufacturers and veterinarians participated in UT Extension's Animal Nutrition Conference. UT Extension placed high priority on forage testing and improved feeding practices. In 2006, 759 samples from beef operations were submitted for testing, and 78 samples from horse farms. Also, 18 samples were submitted from sheep and goat farmers and three samples from Tennessee zoos.

Impact: For each of the 759 samples, an average of three rations is balanced. Previous surveys have indicated that each ration results in approximately $172 worth of improved performance

or feed savings. The direct benefits to participants were $391,000. Since these results are analyzed and shared via county meetings, news articles and other media (such as Tennessee Cooperator, circulation 250,000), it is estimated that the actual impact of this programming was in excess of $1 million in 2006.

Funding: Smith-Lever

Scope: State-specific

Title: Feeder Cattle Marketing

Issue: About 75% of Tennessee's feeder cattle are sold as single animals through weekly auctions. Since buyers have no knowledge of the health or performance history of the cattle, prices are lower than might otherwise be possible. If feeder cattle are properly pre-conditioned and sold cooperatively in large groups, prices would be much higher and net returns greater for beef producers.

What has been done: In 2006, UT Extension continued to address cooperative marketing of feeder cattle for East Tennessee producers. In cooperation with the Hawkins County Cattleman's Association, tours were organized to show producers what buyers were looking for in feeder cattle.

Impact: In 2006 beef producers sold 75 loads of approximately 5,500 head from 16 counties in Tennessee, Virginia and Kentucky; the cattle were valued at about $3 million. The cattle are now sold through the Hodge Livestock Network. It is conservatively estimated that these pre-conditioned cattle when sold in truckload groups bring about $30 per head more than they would if sold as singles at the weekly auction. In addition, producers reap the benefit of adding about 100 pounds to the weight of the cattle when they are being preconditioned.

Funding: Smith-Lever

Scope: Multistate (VA and KY)

Title: PGF Inhibiting in Cattle

Issue: Previous studies from a Tennessee Agricultural Experiment Station's researcher's laboratory had shown a detrimental effect of prostaglandin F2α (PGF) on embryo development and survival in cattle. Following embryo transfer, PGF levels increase due to uterine massage during placement. The use of embryo transfer is rapidly increasing in both beef and dairy cattle due to changes in the industries and the rapid improvement in genetics that can occur with embryo transfer technology.

What has been done: Administration of a PGF inhibitor at the time of transfer prevented the reduction in pregnancy rates by 5% overall and 10% for quality 2 embryos (the majority of those recovered and transferred). Application of this technology is also ongoing in assisted reproductive technologies in humans.

Impact: Based on an average rate of five to ten transfers per client (from several large Tennessee practitioners), we believe this technology is boosting state cattle economics with improved cattle genetics worth about $11.2 million annually, and improved efficiency of recipients and donors valued at about $2.7 million annually.

Funding: Hatch

Scope: State-specific

Title: Feeding Horses: Just the Facts

Issue: New horse owners in Tennessee need reliable information on management, care and health of their horses.

What has been done: In 2006, UT Extension offered 20 courses across the state for new horse owners. The goal was to increase nutritional knowledge of horse owners to improve management of their horse(s). Teaching materials included fact sheets, slide presentations, videos, nutritional feed samples and plastinated parts of the horse's digestive tract.

Impact: Over 1,843 horse owners representing more than 8,100 horses participated in educational meetings with 14% of the attendees submitting hay for analysis and subsequent feeding recommendations. Also, soil sampling increased from participants for the winter meetings. As a result of this educational program, horse owners were impacted by a decrease in feed costs of $12 per head per month and this represents over $110,000 savings in feed cost.

Funding: Smith-Lever

Scope: State-specific

Title: Improved Weed Control

Issue: Poor weed control in row-crop production causes reduced crop yields, and increased tillage and trips across the field – resulting in additional labor costs, soil erosion losses, and higher fuel costs. Two major new weed problems have developed in Tennessee that normal Roundup Ready™ systems do not adequately control (horseweed and Palmer pigweed). Elevated diesel fuel prices have become a major burden to Tennessee farmers.

What has been done: Tennessee Agricultural Experiment Station researchers continue to refine weed control systems that increase yields, reduce labor, retain soil, and cut fuel usage – helping maintain our global competitiveness. Labor savings result from reduced trips over the field; best practices save farmers perhaps 1.3 hours per acre. Soil is saved by reduced tillage, management incentives, education about the soil loss process, and increasingly accurate modeling, among other factors. Growing crops using no-till production systems helps reduce fuel costs. As long as farmers can control weeds, they are able to use no-till systems in some situations.

Impact:

- Labor savings: While farmers develop their best practices from a variety of sources, if Agricultural Experiment Station research is responsible for as much as 30% of labor savings, at $7 per hour over 3.2 million acres of crops, current annual savings equals about $8.7 million in Tennessee.

- Crop yields: Using a total infected Tennessee acreage of about 2.4 million, and an average loss per acre of $9 per acre, if 60% of the savings is attributable to our programs, the loss avoided is about $13 million annually.

- Soil erosion prevention: These savings are estimated in a separate impact.

- Fuel savings: Tennessee has about 1.85 million acres in no-till, which at a savings of 3.8 gallons of diesel per acre, a price of $2.50 per gallon, and assuming a 30% Tennessee Agricultural Experiment Station contribution, equals total savings of about $5.3 million per year.

Funding: Hatch

Scope: State-specific

Title: Improving Tennessee Dairy Production

Issue: Dairy farm numbers in Tennessee continue to decline at an alarming rate. Tennessee now has approximately 600 dairy farms and one to two herds is exiting the dairy business every week on average. Several herd and farm management problems contribute to this decline in dairy farm numbers along with low mailbox milk prices in Tennessee.

What has been done: Specialists and agents have worked with dairy industry organizations and educated dairy producers about the opportunities and constraints for organic dairy production. In addition, specialists and agents have worked with dairy producers on improving health and reproductive performance of their herds by improved cow management, improved cow comfort, increased use of pasture and high quality forage, and by crossbreeding. Over 3,900 direct contacts were made.

Impact: Tennessee now has four dairy herds that have converted to certified organic production; and six more Tennessee herds are in the process of converting to certified organic dairy production. Farm mailbox prices for certified organic milk are two times the price of conventional milk (about $14 versus $28 per hundred pounds) and organic milk contracts eliminate the volatility associated with conventional milk prices. This will generate over $600,000 in added revenue for these four farms each year.

Funding: Smith-Lever; Hatch

Scope: State-specific; Integrated Research and Extension

Title: Pesticide Safety Education Program

Issue: Private applicators (farmers, greenhouse and nursery operators) and commercial applicators must be certified to buy restricted-use pesticides and certified to use them or working under the direct supervision of a certified applicator.

What has been done: UT Extension provided training for private applicators, Worker Protection Standard (WPS) workers, handlers and other trainers. Monthly and quarterly seminars were offered to assist commercial applicators to pass their certification and licensing exams and earn recertification points toward their recertification.

Impact: 1,506 producers, farm workers and other professionals received pesticide certification, recertification and pesticide safety training, which improved their knowledge and skills on pesticide use and enabled them to purchase and use restricted-use pesticides. In addition:

- 77 WPS workers and pesticide handlers gained knowledge in order to comply with the WPS where pesticides were used on their establishments.
- 108 producers, (owners, operators and managers of farms, forests, nurseries and greenhouses) have improved knowledge about the WPS in order to legally operate their agricultural establishments and protect their workers and handlers.

2,368 commercial applicators received recertification training in their category of work from UT or other sources; and these schools were evaluated for recertification points by the UT Pesticide Coordinator or Tennessee Department of Agriculture personnel with these impacts:

- 66 of these various types of pesticide applicators indicated that one or more pesticide safety measures to protect humans and the environment were adopted.
- 274 farmers indicated that they are now applying pesticide according to label directions.
- 257 farmers indicated that they are now complying with the WPS.

Funding: Smith-Lever; Environmental Protection Agency

Scope: State-specific

Title: Soybean Yield Gains

Issue: The southern US produces approximately ten million acres of soybeans, though no single variety is produced over such large acreage. In a globally-competitive environment, ongoing incremental yield gains are important for the US agricultural market.

What has been done: Soybean breeding in the region produces genetic gains of approximately 0.4 bushels per acre each year. Varieties and breeding lines from Tennessee Agricultural Experiment Station research are currently being used by both major and minor seed companies, incorporating superior genetics into an estimated 2% of commercially-deployed varieties throughout the Mid-South and Southeast US region, and an estimated 10% of varieties in Tennessee.

Impact: At a current commodity price of $7.80 per bushel, and Tennessee acreage of 1.2 million acres, the impact of one year of research might be estimated at $374,000 in Tennessee alone.

Funding: Hatch

Scope: Multistate (Southeastern United States)

Title: Economic Impact of Variety Test Data to Tennessee Crop Producers in 2006

Issue: Meetings with the state's 95 County Agriculture Committees reveal that variety testing continues to be an important need for Tennessee's cotton, corn, soybean and wheat producers. Crop producers need to improving yields while limiting cost inputs to remain in a competitive position.

What has been done: In 2006, UT Extension continued the County Standardized Variety Test to enable producers to identify locally available superior varieties (hybrids) with superior disease-resistant characteristics for use on their farms. In Tennessee, 27 counties participated in the trials, and two UT Experiment Stations also participated. Over 150 demonstrations were conducted on Tennessee farms and at experiment stations.

The variety test results were taught to producers through field days and group meetings; direct mail pieces; publications; radio programs; TV programs; agribusiness visits; and on-farm contacts.

Impact: According to on-farm interviews with 56 grain producers in eight major row crop counties in Tennessee (Coffee, Dyer, Gibson, Giles, Henry, Lake, Obion, and Weakley), approximately 80% of those producers base their variety buying decisions on data provided in

UT variety test publications. According to the Tennessee Agricultural Statistics Service (TASS), approximately 5,000 oilseed, grain crop and cotton farmers in Tennessee grew approximately 1.1 million acres of soybeans, 500,000 acres of corn, 695,000 acres of cotton, and 280,000 acres of wheat in 2006. Based on the above survey information, one might conservatively assume that 80% of the soybean, corn, wheat and cotton growers in Tennessee make choices of varieties to grow in their operation based on the UT variety test data.

The results from the 2006 Tennessee variety test data indicate that the difference in yields between the top one-third yielding groups and bottom one-third yielding groups in the different crops were roughly as follows: 15 bushels per acre corn; 6 bushels per acre soybean; 4 bushels per acre wheat; and 200 pounds of lint per acre cotton. Again, according to the survey, 75% of the producers grew varieties from the top yielding groups; therefore, we will assume that 70% of all Tennessee producers are planting varieties from the top yielding groups based on UT test data. 70% of the 2006 acreage for the different crops is: 350,000 acres of corn; 770,000 acres of soybean; 487,000 acres of cotton; and 196,000 acres of wheat.

Multiplying the adjusted acreage numbers by the added yields listed above, the added volume for each crop is as follows: 5,250,000 bushels of corn; 4,620,000 bushels of soybeans; 784,000 bushels of wheat; and 97,400,000 lbs of lint cotton. Those values are the estimated additional production for each of the crops based on 70% of the state's producers growing the top one-third versus bottom one-third group of varieties. If one uses the commodity prices as reported by TASS and AgProfessional.com for the 2006 season for corn ($2.85 per bushel), soybeans ($6.30 per bushel), wheat ($3.50 per bushel) and cotton ($0.50 per pound), then the economic impacts via added production for the four crops in Tennessee in 2006 are as follows: $15.0 million for corn; $29.1 million for soybeans; $2.7 million for wheat; and $48.7 million for cotton. The combined total economic impact of the Variety Test data to Tennessee crop producers is $95.5 million.

Funding: Smith-Lever; Hatch

Scope: Integrated Research and Extension

Title: Row Crop Disease Control Program

Issue: Cotton producers have lost an average of 11% of their crop to seedling diseases and nematodes over the last 5 years. Soybean producers are loosing and average of 25 % of their production potential to diseases and nematodes.

What has been done: UT Extension conducted cotton crop disease control programs across the state. On-farm demonstration plots were utilized to show producers the value of fungicide seed treatments and in-furrow fungicide treatments; 52 fungicide treatments were tested in six replicated plots. In addition, 53 treatments were tested in six replicated plots for reniform nematode control. Several field days were held and results were shown to producer and

information was disseminated widely. A reniform nematode survey was conducted to demonstrate to producers that this nematode is increasing and can cause severe problems in cotton production. UT Extension also conducted 20 soybean disease control meetings across the state with over 600 producers attending. The latest research in soybean disease control, including soybean rust, was discussed in detail at all of these meetings.

Impact: These programs resulted in cotton producers improving their seedling disease and nematode control and increasing their production and profits. On farm demonstrations and research results demonstrated an increase in profits by $100- $150 per acre. About 75% of producers adopted superior seed treatments instead of in-furrow fungicides as a result of these tests. This eliminated the need for more hazardous and costly chemicals for both seedling diseases and nematode control. Soybean producers are now able to select varieties that have a high level of disease and nematode resistance. They also have information on which foliar fungicides to use and which varieties they should spray and what and when to spray for soybean rust. This has increased production levels for many producers by $50 to $100 per acre. Using the conservative $50 per acre and applying it to 50% (500,000 acres) of the state's soybean production, this program increased soybean profits by $50 million.

Funding: Smith-Lever; Hatch; Cotton, Inc.

Scope: Integrated Research and Extension

1.3 Key Theme: Innovative Farming Techniques

Title: Sprayer Best Management

Issue: Agricultural spray drift (from intended targets) results in off-target losses, liability costs, and environmental impact.

What has been done: Sprayer best management procedures (BMP) using modern spray nozzle selection techniques aid applicators in selecting and using the right equipment to make responsible applications to reduce drift by 40% compared to 10 years ago.

Impact: Drift reduction savings in Tennessee were $2.25 million of off-target losses, not including savings in liability costs and environmental impact. Recent Tennessee Agricultural Experiment Station nozzle classification and improved technologies impacted the engineering design of 190,000 spray tips sold annually, $500,000 in annual spray boom sales, and $3.8 million of sprayer unit sales (including as many as 50 new self-propelled units annually in Tennessee).

Funding: Hatch

Scope: State-specific

Title: Irrigation for Humid Regions Maximizes Economic Return and Minimizes Non-Point Source Pollution

Issue: In humid regions, natural precipitation contributes significantly to the yield potential of a crop and the decision to purchase an irrigation system requires the evaluation of many factors. Producers want to know if it makes economic sense to invest in irrigation when considering yield potential, crop price, field size, soil type, irrigation type and the cost of irrigation. Also, irrigation management is more difficult in humid regions because crop-water use rates vary significantly from year to year and because rainfall is unpredictable. Producers want to know when to start and stop irrigation in order to maximize yield, minimize production inputs, and reduce non-point source pollution.

What has been done: The Tennessee Irrigation Survey of Row Crop Production was conducted at UT Experiment Stations and through on-farm research and demonstration programs. This was conducted with the collaboration of Extension specialists from various academic departments, producers and Extension agents. In 2006, 1126 producers and professionals were trained in irrigation design, installation, and management at 18 field days and demonstrations. Also, as a follow-up to the group events, 327 individual clients received individual technical assistance.

Impact: Because of this program, improved irrigation scheduling methods were adopted by producers who farm over 40,000 acres of row crops in West Tennessee. This integrated research and extension program also supported the establishment of a locally owned irrigation business in West Tennessee that provides equipment and scheduling products.

Funding: Smith-Lever; Hatch; Phillip Morris; Cotton Incorporated; and USDA-NRCS Grazing Coalition

Scope: Integrated Research and Extension

1.4 Key Theme: Fruit/Vegetable Production

Title: Vegetable Initiative

Issue: The decline in tobacco income in Tennessee, as well as new markets and demand for alternative crops, has led to a need for increased research on vegetable and new crop varieties, chemical application strategies, and improved tillage, management, and marketing practices.

What has been done: Tennessee Agricultural Experiment Station research programs evaluated new varieties of vegetable crops, crop protection chemicals, fertility programs, irrigation systems, frost protection systems, new production methods, biodegradable plastic mulches, and marketing systems for vegetable crops. We also explored new crops for Tennessee producers such as blueberries, strawberries, blackberries, greenhouse cucumbers, and greenhouse peppers

and radicchio. These crops showed sales and profit potential for state growers, but refinement of production inputs and cultural systems were necessary to maximize profits and yields.

Impact: These vegetable initiative programs and demonstrations helped increase revenues from commercial vegetable crops by more than $11 million year over year. A total of 92 new producers started production in 2006.

Funding: Hatch

Scope: State-specific

Title: Reducing Risks in Fruit and Vegetable Production through Disease Management

Issue: Losses to yield in Tennessee fruit and vegetable production in recent years have tended to come from high-impact, whole-field disease outbreaks. Examples are Phytophthora capsici blight and cucurbit downy mildew. Losses of this magnitude have the potential to cause financial ruin to the farm operation. The best chance of surviving such events is a proactive approach by growers.

What has been done: Educational programs have alerted growers to possible impending outbreaks of certain diseases and created an awareness of the importance of remaining prepared at all times. Through group meetings, newsletters, field days, and farm visits, growers learned what crop rotations to follow, what resistant varieties to plant, and how to choose the most appropriate spray materials. UT and TSU Extension made over 3,000 contacts with fruit and vegetable growers.

Impact: Crop losses to cucurbit downy mildew in pumpkin and other cucurbit crops in 2006 were less than 5% of those in 2005. Certain other states experienced severe losses to this fungus, which is spread by spores that travel great distances on air currents. Losses to Phytophthora blight of cucurbits, peppers, and tomatoes were 70% of those in 2005. Similar progress was made with the bacterial diseases of tomato. In Carter and Wilson Counties, agent observations were used to document 79 fruit and/or vegetable producers who adopted an integrated pest management approach to insect, mite and disease control because of this program. The same observations documented 99 of 103 (96%) producers who learned to identify pest insects, mites and diseases.

Funding: Smith-Lever

Scope: State-specific

Title: Risk Management Education for Fruit and Vegetable Producers

Issue: Agriculture in the Southern Region is undergoing significant and rapid change. Recent changes in tobacco marketing have created a high level of uncertainty and motivated many farmers to explore and evaluate alternative sources of income, including fruit and vegetable production.

What has been done: An Organic Fruit and Vegetable Systems In-Service Training was conducted in Crossville, Tennessee for 51 Extension personnel from Tennessee and surrounding states. This project addressed the need for multidisciplinary vegetable and fruit-risk management professional development training for Extension personnel in the Southern Region. Emphasis was placed on comparing risk management strategies in conventional and organic production and marketing systems of vegetables and fruits. Presenters were a mix of UT and TSU personnel, independent growers, and organic production specialists from surrounding states.

UT and TSU Agents then made over 2,700 contacts with growers through group meetings, farm visits, direct mail, telephone, and grower visits to their local Extension office.

Impact: Observations and record-keeping by Extension Agents indicate the following outcomes:

- 100 fruit and vegetable producers increased their knowledge of produce industry best management practices.
- 100 fruit and vegetable producers increased their marketing knowledge and decision making skills by learning about the current market situation and alternative marketing tools and practices.
- 200 fruit and vegetable producers increased their understanding of the produce industry, how it operates and key success factors.
- 99 fruit and vegetable producers improved profits through innovative marketing and value-added strategies.
- 48 farm families successfully diversified into fruit and vegetable production and marketing.
- 20 fruit and vegetable producers developed marketing plans for their business.
- 20 fruit and vegetable producers improved profits through innovative marketing and value-added strategies.

Funding: Smith-Lever

Scope: Multi-state (KY, VA, NC, GA, AL, MS and AR)

1.5 Key Theme: Green Industry, Greenhouse, Turf and Nursery Stock

Title: Identification of Diseases in the Green Industry

Issue: Plant diseases are one of the key limiting factors to profitable operation of turf, greenhouse and nursery operations in Tennessee and the U.S. In fact, millions are spent each year on fungicides to protect plant material from fungal plant pathogens. Some of the applications are made in error as the producer doesn't identify the disease problem prior to applying the fungicide; or mistakenly identifies the disease based on field symptoms only; or applies a fungicide without a diagnosis due to time constraints of sending a sample and receiving a diagnosis from a disease clinic.

What has been done: Over 800 sets of digital images (many photo-micrographs taken with microscopes and digital cameras) were submitted by Extension personnel via the Distance Diagnostic website. Images were reviewed by Extension entomologists and plant pathologists; diagnoses were made; and management strategies were returned via the web to Extension agents, typically in less than 24 hours. The speed of this system allowed producers to make informed decisions about insect and disease management. UT Extension provided trained golf course superintendents, consultants, university professors and students in microscopic turf disease identification at a statewide turf short course and a national turf conference. Illustrated manuals on the "Microscopic Identification of Turf Diseases" and the "Microscopic Identification of Ornamental Diseases" were written and provided for over 300 participants.

Impact: Evaluations were obtained from 291 participants representing 97% of the clients involved in the workshops. More than 90% of the workshop participants agreed or strongly agreed that the knowledge they had gained during the workshops would be valuable to them at their operation or in their consulting service. Over 50% of the participants that had microscopes, but had not been using them due to lack of knowledge or confidence in their abilities, said that they would now definitely use the microscopes at their offices to identify turf and ornamental diseases.

Funding: Smith-Lever

Scope: National

Title: Turfgrass Management Strategies

Issue: The turfgrass and landscaping industries must balance pesticide use, safety concerns, and plant selection for golf courses and landscape plantings.

What has been done: Turfgrass management training sessions were conducted in Knoxville and Jackson in 2006. About 300 attendees were trained on a variety of Tennessee Agricultural Experiment Station research-based topics, including selection of environmentally-safe pesticides,

improving safety of K-12 athletic fields, and utilizing native plants in various locations. Of the attendees, approximately 60% were identified as primary business owners or managers in-charge of purchasing turfgrass management supplies for their business or organization.

Impact: On an annual basis, we estimate that this training had a substantive effect on the participants' pesticide purchases ($2 million), athletic field maintenance practices ($300,000), use of native plants ($100,000), as well as one-time effects on purchase of turfgrass management equipment ($500,000), and selection of turfgrass sod or seed ($100,000).

Funding: Hatch; Smith-Lever

Scope: Integrated Research and Extension

Title: Attacking Woody Ornamental Diseases

Issue: There are a variety of critical pathological and cultural control problems that affect the commercial production of dogwood, rose, azalea, daylily, hydrangea, African violet, and yellow wood.

What has been done: A team of Tennessee Agricultural Experiment Station researchers is collaborating with Tennessee nurseries, USDA Agricultural Research Service, and TSU scientists in a woody ornamental disease control project.

Impact: Growing resistant dogwoods is estimated to save $100,000 in disease control costs annually. In addition, the resistant trees have added wholesale value, estimated at $2.9 million Using "no-spray" roses avoids the cost of black spot control, with an estimated value of $3.1 million annually. Tennessee Agricultural Experiment Station research recommendations spare African violet plants worth roughly $700,000 annually, while the Encore Azaleas based on our research bring in about $300,000 annually at Tennessee retail nurseries.

Funding: Hatch

Scope: State-specific

1.6 Key Theme: Small Farm Viability

Title: TSU Educates Tennessee Certified Organic Growers Association

Issue: According to the 2002 census, there are approximately 85,662 farms in Tennessee, and 7% have an income of less than 10,000. Minorities operated 1,458 farms (1.7% of all farms), and produced farm income of $373,968. Although small farm operators produce a smaller percentage of the total agriculture output, they control significant agricultural inputs and are an

important stabilizing force for agricultural-related rural business communities. Problems of small farm operators have traditionally included limited capital, uneven cash flow, lack of management skills, and limited land resources and specifically alternative cropping systems and animal enterprises that can compete for market niche.

What has been done: In 2001 Tennessee State University Cooperative Extension conducted its first Third Tuesday field day. One of these workshops focused on Organic Production of vegetables. This took place at the time when USDA released the official standers for organics. At this same time, the official certified organic acreage in Tennessee fell to 300 acres from a previous non-certified acreage of 1,334 in the year 2000. This significant drop in organic acreage led to increased consumer demand for certified organic foods. This further led to the initiation of the Tennessee Organic Growers Association (TOGA) under the leadership of Tennessee State University Cooperative Extension Program.

Impacts: After various meetings with certified and non-certified organic growers at Tennessee State University the Tennessee Organic Growers Association officially filed and established as a non-profit organization with the state of Tennessee in 2003. In 2005, the first Tennessee Organic Growers Conference was held at Tennessee State University with 40 in attendance followed by the second conference in 2006 with 21 in attendance. According to the state department of agriculture, the certified organic acreage increased from 300 acres in 2001 to 672 acres in 2006. The 672 certified organic acres includes certified crops and 55 acres with pasture poultry and other animals supporting eight certified operators and over 165 small organic businesses.

Funding: NARETPA Section 1444 and 1445

Scope: State-specific

Title: Small Farm Production/Demonstration

Issue: Tennessee's small farmers are extremely valuable in providing niche and specialty goods. They also provide product locally and directly to consumers. Small farmer needs included education in sweet potatoes, warm season grasses, and weed control in pastures.

What has been done: The TSU Cooperative Extension Program conducted eight Third Tuesday field days and educational workshops. Third Tuesday is conducted at the Tennessee State University Research and Extension Demonstration Farm which continued to be the major vehicle to reach small and limited resource farmers in 2006. As in past years, the Third Tuesday field days involved over 300 growers during 2006. The workshops were conducted on ornamentals, turfgrass and landscape management, agroforestry, geographical position system, commercial pest management, goat production, sweet potato production and marketing.

TSU Extension conducted a sweet potato gypsum trial. In 2006, TSU held its annual Small Farm Expo and Small Farmer Recognition Program with over 350 people participating in tours and workshops. The participants included farmers, representatives from agriculture agencies, agriculture educators, students and community leaders. Tours were conducted on sweet potato production, pigeon peas, warm season grass, small fruit, goats, hybrid walnuts and dogwood and weed control in pastures. This will be an ongoing selection to recognize our outstanding small farmer in the state of Tennessee for their hard work and dedication to the agriculture industry.

In Hardeman County, the TSU Extension Agent worked with ten Hmong Chinese farmers in improving production practices and markets. Two herbicide demonstration plots in southern peas were put out on two farms. Agent worked with a Hmong farmer growing cut flowers in an effort to help market his flowers. Hmong farmers are seeing that by the use of herbicides to control weeds they are able to increase their production in peas.

Impact: One Hmong farmer started a cut flower operation in 2006 through consultation with TSU Extension. He has seen this niche market grow through marketing at Memphis Farmers Markets. He plans to increase his production next year due to his success.

A sweet potato variety trial was conducted on the TSU Research and Demonstration Farm. Based on evaluation data, beauregard and beauregard (B-14) were the highest yielding quality varieties in the trail. The B-14 is a new improved beauregard variety. The two-year average on beauregard is 396.5 bushels per acre and beauregard (B-14) is 441.5 bushels per acre. At current prices of $15.00 per bushels, this would yield a potential gross income increase of $675 per acre. The beauregard varieties are the most desired potatoes for the fresh market. Beauregard represents 90% of the sweet potato fresh market.

The second year of the on-farm sweet potato trial was conducted on a Montgomery County farm using gypsum as a soil amendment. According to the result, the farmer two year average yields were 537 bushels per acre on the test and 172 bushels per acre on the control. This is a yield increase of 365 bushels per acre. At an average price of $15 per bushel, this would yield a potential gross income of $5,475 per acre.

Funding: NARETPA Section 1444 and 1445

Scope: State-specific

Title: Tennessee AgrAbility Project

Issue: Disabilities impact individuals and families by reducing their ability to perform tasks associated with their occupations, daily living and transportation. The impacts of disabilities on farmers can be greater than similar disabilities suffered their by urban counterparts because farmers are self-employed and lack many of the benefits and services available to employees of most corporations. Furthermore, there are fewer treatment and rehabilitation services in rural

areas, and many medical professionals are not familiar with farming practices or the uniqueness of agriculture as a business or occupation.

What has been done: The Tennessee AgrAbility Project is a collaborative effort of the UT Extension and four partners subcontracted to the project – Tennessee State University Cooperative Extension Program, Easter Seals in Tennessee, East Tennessee Technology Access Center (ETTAC), and Special Technology Access Resource (STAR) Center. The primary goal of the AgrAbility Project is to provide direct, on-farm services to assist farmers in identifying, developing and implementing methods for coping with disabilities. Project staff review accessibility and safety, and suggest ways to enhance productivity and prevent secondary injuries.

Impact: The AgrAbility Project assisted 15 new farmer clients through on-site visits and workplace assessments, and previous clients continue receiving assistance implementing their plans. More than 300 medical and agricultural professionals increased their understanding of the impacts of disabilities on farmers and rural residents, and the methods used to increase accessibility of homes, offices, businesses and farm buildings and equipment.

Funding: Smith-Lever; USDA CSREES Award Number 2005-41590-01366

Scope: State-specific

1.7 Key Theme: Agrosecurity

Title: Extension Responds to Hamilton County's Agroterrorism Threat

Issue: UT Extension identified the need for increased security in Chattanooga/Hamilton County. With the county being a significant center for food distribution, processing, and transportation, agrosecurity has become a major concern for area law enforcement and agricultural agencies. Hamilton County is home to a major seed packing plant, two poultry processing plants, one regional flour mill, one grain/feed mill, and two snack food plants with national distribution. In the 10-county area there is an approximate poultry house capacity for 10 million birds. Additionally, Hamilton County is also located at the intersection of Interstates 75 and 24 which provide for major north-south transportation.

What has been done: As part of Tennessee's Homeland Security response to agro-terrorism, UT Extension conducted 23 group meetings/demonstrations for 791 Hamilton County residents. Extension also provided leadership for the Homeland Security District Three agriculture response by updating the county's Emergency Situation Functions dealing with agriculture (also known as ESF-16). Additionally, UT Extension personnel worked with representatives of the Tennessee Department of Agriculture (TDA), Tennessee Emergency Management Agency (TEMA), County Health Department, and County Emergency Management Agency to establish and provide training for a county Disaster Animal Response Team.

Impact:

- 55 agribusiness operators, livestock producers and veterinarians, completed livestock emergency management and incident command system training. (They became first responders for animal care and housing during a disaster.)
- 7 of the 7 producers contacted for follow-up evaluation had developed agrosecurity management plans.
- 10 of 10 producers contacted for follow-up evaluation had implemented improved site security measures, including locked gates and buildings.

Funding: Smith-Lever

Scope: State-specific

Goal 2 – A Safe and Secure Food and Fiber System

2.0 Overview

2a. Results

In FY 2006, UT and TSU Extension made 49,453 contacts in Goal Two programs and activities. Consumer food handling behaviors were improved through Extension efforts. In response to needs for a safe and wholesome food supply and improving the marketability and profitability of feeder calves, UT Extension initiated the Beef Quality Assurance (BQA) Certification Program in 2000. The program continued to expand in 2006 with a total of 4,331 producers certified or re-certified.

2b. Highlights

UT Extension developed and implemented a statewide program called Safe Food for Tennessee: Safe Food Handling Practices for Consumers. This program reached 7,430 direct contacts through direct mail/telephone calls, client visits, on-site visits and group meetings. Approximately 4,060,083 contacts were made through indirect contacts from TV programs, radio programs, newspaper articles, exhibits, promotional items and publications.

Beef producers that have their BQA Certification received $3 million in 2006 from the Tennessee Agricultural Enhancement Program. This program is administered by the Tennessee Department of Agriculture and it makes direct payment to farmers for improvement to their beef operation. Beef Quality Assurance was made one of the qualifications for the program.

2c. Benefits

Research has demonstrated that unsafe consumer food handling behaviors increases the risk for foodborne illness. The following Safe Food for Tennessee changes were reported in 2006:

- Over 8,600 participants more often washed their hands with soap and warm running water before preparing food and before eating.
- Over 6500 participants more often cooked foods to safe internal temperatures.
- Over 7,000 participants washed their hands with soap and warm running water after working with raw meat, chicken, or seafood.

A number of Tennessee livestock markets have conducted sales with a requirement that calves be from BQA Certified Producers. Two video auctions have marketed BQA Certified Cattle. These are Wilson Livestock Network and the Lower Middle Tennessee Cattlemen's Association Board Sales. Cattle with BQA Certification and a defined health program continue to sell for an average of $3-5 per hundred more than comparable cattle sold at weekly auctions the same day. In 2006, Extension agents in 52 counties observed that 1,327 producers sold 47,886 calves that

were managed according to BQA guidelines. The added value of Tennessee calves marketed according to BQA guidelines in 2006 was $883,492.

2d. Assessment of Accomplishments

In FY 2006, UT Extension did an exemplary job of coordinating multiple resources and funding sources to address food safety issues of statewide concern. The Safe Food for Tennessee program was delivered with Smith-Lever, Smith-Lever d (EFNEP) and USDA Food Stamp Nutrition Education funds. As with all Extension programs conducted in Tennessee, local funding and in-kind support for local implementation was secured. In the case of Safe Food for Tennessee, 21 Extension Agents were surveyed regarding the amount and kind of local resources used for the program. All 21 agents involved local resources; one example was the Grundy County Food Bank that provided the program $200 in food and supplies for food safety demonstrations. The local resources totaled $56,465 from the 21 counties surveyed.

2e. Allocations for Goal 2

UT 1862 Research – $3,304,768 • Hatch – $415,830 • Multistate 3(c)3 – $118,761 • Animal Health – $27,187 • State – $ 2,742,990	**FTEs for Goal 2 – 70.04** • UT 1862 Research – 62.2 (9.7 scientist and 52.5 non-scientist) • UT 1862 Extension – 5.1 • TSU 1890 Extension – 2.74 (2.68 professional and 0.46 para-professional)
UT 1862 Extension – $482,908 • Smith-Lever b and c – $76,811 • Smith-Lever d (EFNEP) – $77,824 • State/County – $328,273	**TSU 1890 Extension – $25,004** • NARETPA Section 1444 and 1445 – $21,987 • State/County – $3,017

2.1 Key Theme: Safe Food Handling

Title: Safe Food for Tennessee

Issue: The Centers for Disease Control and Prevention (CDC) estimates that foodborne diseases cause approximately 76 million illnesses, 325,000 hospitalizations, and 5,000 deaths in the United States each year. The Economic Research Service has estimated the annual U.S. economic costs incurred for the five major bacterial pathogens alone to be $6.9 billion. The cost estimate includes medical costs, productivity losses from missed work, and an estimate of the value of premature death.

What has been done: Agents and volunteers made 7,430 direct contacts through direct mail/telephone calls, client visits, on-site visits and group meetings. Approximately 4,060,083 contacts were made through indirect contacts from TV programs, radio programs, newspaper articles, exhibits, promotional items and publications. As with all Extension programs conducted in Tennessee, local funding and in-kind support for local implementation was secured. In the case of Safe Food for Tennessee, 21 Extension Agents were surveyed regarding the amount and kind of local resources used for the program. All 21 agents involved local resources; one example was the Grundy County Food Bank that provided $200 in food and supplies for food safety demonstrations. The local resources totaled $56,465 from the 21 counties surveyed.

Impacts: Research has demonstrated that unsafe consumer food handling behaviors increases the risk for foodborne illness. The following consumer food handling behavior changes were reported in 2006:

- 8,686 of 8,939 participants surveyed more often washed their hands with soap and warm running water before preparing food.
- 8,713 of 9,371 participants surveyed more often washed their hands with soap and warm water before eating.
- 6,804 of 6,899 participants surveyed more often washed items that came in contact with raw meat, chicken or seafood with hot, soapy water before continuing to cook.
- 2,779 of 2,960 participants surveyed more often thoroughly washed their produce under running water before eating them.
- 6,577 of 6,688 participants surveyed more often washed the plate used to hold raw meat, poultry, or seafood with hot, soapy water before returning cooked food to the plate or used a clean plate.
- 6,556 of 6,799 participants surveyed more often cooked foods to safe internal temperatures.
- 2,222 of 2,469 participants surveyed consumed fewer foods from unsafe sources.
- 2,069 of 2,893 participants surveyed used a thermometer to check the internal temperature of food.

- 2,085 of 2,816 participants surveyed used a thermometer to check the internal temperature of their refrigerator.
- 7,074 of 7,298 participants washed their hands with soap and warm running water after working with raw meat, chicken, or seafood.

In addition, 295 of 393 pregnant or formerly pregnant participants surveyed avoided one or more of the following foods during pregnancy: cold hot dogs, soft cheese like brie, Camembert and queso fresco and cold deli meats.

Funding: Smith-Lever; Smith-Lever d (EFNEP); USDA Food Stamp Nutrition Education

Scope: State-specific

Title: Better Process Control Schools

Issue: The United States Food and Drug Administration (FDA) requires all individuals that perform container closure inspections in low acid canned food operations or processing foods that are acidified to be under the supervision of a person who has attended and satisfactorily completed a school approved by the Commissioner of the FDA.

What has been done: UT Extension conducted nine Better Process Control Schools (BPCS) in 2006 for 155 food-processing personnel and managers. Six events were industry specific for Suter Foods, Berner Foods, Bush Brothers and Masterfoods. One school was open to a variety of companies from across the United States. Two schools were acidified schools.

Impact: Having successfully completed these classes, these companies may operate in compliance with the law and produce a safe product. For those that did not pass the course, it assures that they are not in a position in the operation that could critically affect the safety of the food they produce. The population these companies provide food to is conservatively 30 million. If the food safety program reduced the potential incidence of food borne illness by 1 in 1,000, approximately 30,000 cases of food borne illness were prevented.

Funding: Smith-Lever; User fees

Scope: State-specific

2.2 Key Theme: Food Quality

Title: Tennessee Beef Quality Assurance

Issue: Consumers are concerned that the food they eat is safe and wholesome. Consumers are also concerned about the way beef animals are managed on the farm. Beef producers are

concerned about ways to improve the marketability and profitability of feeder calves. The Beef Quality Assurance Certification Program has helped address both issues.

What has been done: The Tennessee Beef Quality Assurance (BQA) Certification program that was initiated in 2000 continued to expand in 2006. Since the start of the BQA Certification Program, 8805 producers have received their BQA certification. A total of 4,331 producers were certified or re-certified in 2006.

Impact: Beef producers that have their BQA Certification have received $3 million from the Tennessee Agricultural Enhancement Program. This program is administered by the Tennessee Department of Agriculture and it makes direct payment to farmers for improvement to their beef operation. Beef Quality Assurance was made one of the qualifications for the program. A number of livestock markets have conducted sales with a requirement that calves be from BQA Certified Producers. Two video auctions have marketed BQA Certified Cattle. These are Wilson Livestock Network and the Lower Middle Tennessee Cattlemen's Association Board Sales. Cattle with BQA Certification and a defined health program continue to sell for an average of $3-5 per hundred more than comparable cattle sold at weekly auctions the same day. In 2006, Extension agents in 52 counties observed that 1,327 producers sold 47,886 calves that were managed according to BQA guidelines. The added value of Tennessee calves marketed according to BQA guidelines in 2006 was $883,492.

Funding: Smith-Lever

Scope: State-specific

Title: Food Processing Advances

Issue: A food processor in Tennessee wanted to evaluate an improved process for an alkali hydration of corn for hominy production. The goal was to improve process time and product quality – at stake for the company was a new processing line and processing operations.

What has been done: Tennessee Agricultural Experiment Station researchers conducted a project to determine an acceptable pressure treatment that could be used. Results demonstrated that using the selected processing treatments reduced process time and improved the quality of the product.

Impact: The Company moved to implement a continuous (vs. batch) process and made a decision to purchase equipment. Total savings and investment in new procedures by the company were estimated at up to $200,000.

Funding: Hatch

Scope: State-specific

2.3 Key Theme: Foodborne Pathogen Protection

Title: Foodborne Illness Prevention

Issue: Foodborne illness from improper food handling and improper sanitation practices is preventable. Persons most susceptible include the very young, the elderly, pregnant women and their fetuses, and those with lowered immune systems – about 20% of the U.S. population. Since a large percentage of infants and young children in the US are cared for in child care facilities, food safety in these facilities is of utmost importance. It is estimated that there are nearly four cases of diarrhea illness per child per year in child care centers.

What has been done: Tennessee Agricultural Experiment Station researchers developed and implemented "sanitation standard operating procedures" for cleaning food contact surfaces and diaper changing areas in child care centers, then monitored the microbiological status of these areas over a period of two months, and compared the results to a baseline study on surface microbiology in the same centers. Following implementation of the training and procedures, there was a greater than 99% reduction in coli form bacteria on surfaces in each center.

Impact: Since coli form bacteria are indicators of potential contamination by Salmonella or E. coli, this reduction in contamination translates to a reduction of potential illness among children in the centers. In the two centers involved, there are approximately 150 children and 30 teachers. Assuming a previous average of four illnesses per year per child, if a reduction of 90% can be estimated, about 540 illnesses per year would be avoided. The USDA Economic Research Service and the FDA estimate a non-life threatening case of E. coli costs between $2,200 and $55,000 per case. Using the most conservative of these estimates, this program potentially saved $1.2 million in these two centers alone.

Funding: Hatch

Scope: State-specific

Goal 3 – A Healthy and Well-Nourished Population

3.0 Overview

3a. Results

Research indicates that more than 25% of Tennesseans are obese; the state ranks sixth in the nation in prevalence of overweight and obesity. The health related consequences of overweight and obesity costs the Tennessee health care system more than $1.8 billion annually. UT and TSU Extension responded to the need for healthier lifestyles. In 2006, Extension conducted statewide programs in emotional eating, physical activity, diet quality and weight maintenance/weight loss. Extension's statewide needs assessments showed that Tennesseans needed greater health care literacy; and programs in arthritis, diabetes and breast and cervical cancer achieved documented results.

3b. Highlights

Tennessee Shapes Up is a nutrition education program that has been developed and implemented by UT Extension to help individuals achieve and maintain a healthy weight. In FY 2006, the program was implemented in almost all 95 counties in Tennessee. The program involves walking and nutrition classes delivered over an eight-week period. There was a total of 12,540 group meetings conducted to implement Tennessee Shapes Up with 231,748 contacts. Extension staff communicated the diet and health methods in the Tennessee Shapes Up program using a variety of indirect or social marketing strategies, such as exhibits, newspapers, radio programs, TV programs and promotional materials to potentially reach over 1.8 million Tennesseans. In addition to the participants reached by Extension personnel, trained volunteers reached an additional 80,863 contacts.

In 2006, Extension enrolled 4,080 families (14,062 individuals) in the Expanded Food Nutrition Education Program (EFNEP). About 67% of families graduated after reaching educational objectives, and 21% continued their participation into 2007.

UT Extension introduced the TEAM UP Tennessee program to address breast and cervical cancer screening. The program consists of creating community partnership to teach evidence-based strategies to increase breast and cervical cancer screening in eleven Appalachian counties. The target audience is women who have never or rarely been screened and who are living in counties with persistently high breast and/or cervical cancer mortality. In 2006, the program reached 398,345 women with breast and cervical cancer information.

3c. Benefits

Tennessee Shapes Up reported these results as measured by participant questionnaires:

- 80% of the 14,170 participants surveyed reported they decreased intake of high fat foods such as chips, fast food, fried foods and bologna.

- 84% of the 15,583 participants surveyed learned how to use My Pyramid and the Dietary Guidelines.
- 85% of the16, 933 participants surveyed reported they increased intake of fruits.
- 73% of the 19,266 participants surveyed reported they increased intake of vegetables.

Of the 4,052 participants receiving food stamps reached by TSU Extension:

- 100% learned the value of healthy cooking and indicated that they will adopt healthier food choices.
- 95% indicated that they would adopt practices to have food last through the end of the month without having to seek emergency food from food pantries.

Between 2003 and 2006, the number of women screened through the Tennessee Breast and Cervical Screening Program increased fourfold in comparison with control counties, who did not receive the educational interventions. Women reported via questionnaires and interviews, they no longer were afraid to get screened for breast cancer (89%) and cervical cancer (74%). Additionally, 40% of the women who smoked reported they would stop smoking, and 91% of the respondents planned to do monthly breast exams.

3d. Assessment of Accomplishments

The behavior changes documented in the Tennessee Shapes Up programs were exemplary in FY 2006. One contributing factor to the program's success was the implementation strategy which involves the community for positive change. Tennessee Shapes Up was implemented via county partnerships between Extension and other agencies and organizations, such as local schools, health clinics, food stamp offices and public housing authorities. In many instances, professionals from the partnering organizations team teach with the Extension professionals. Using this strategy, the community receives repeated and consistent healthy lifestyle messages from the various community agencies and organizations.

3e. Allocations for Goal 3

UT 1862 Research – $385,668 •Hatch – $168,352 •State – $217,316	**FTEs for Goal 3 – 138.62** •UT 1862 Research – 8.0 (1.8 scientist and 6.2 non-scientist) •UT 1862 Extension – 123.1 •TSU 1890 Extension – 7.52 (6.18 professional and 1.74 para-professional)
UT 1862 Extension –$11,589,802 •Smith-Lever b and c – $1,843,465 •Smith-Lever d (EFNEP) – $1,867,778 •State/County – $7,878,559	**TSU 1890 Extension – $600,095** •NARETPA Section 1444 and 1445 – $527,689 •State/County – $72,406

3.1 Key Theme: Human Nutrition

Title: Tennessee Shapes Up

Issue: More than 25% of Tennesseans were obese in 2005 and the state ranked 6th in the nation in prevalence of overweight and obesity. Overweight and obesity are a substantial drain on health care resources for many families and the health care system. The health related consequences of overweight and obesity costs the Tennessee health care system more than $1.8 billion annually. The experts agree that unhealthy an unhealthy lifestyle is the leading cause of this serious problem.

What has been done: *Tennessee Shapes U*p is a nutrition education program that has been developed and implemented by UT Extension to help individuals achieve and maintain a healthy weight. The program has been implemented in almost all 95 counties in Tennessee. The program, composed of walking and nutrition classes over an eight-week period, focuses on making healthy choices and increasing physical activity.

Tennessee Shapes Up is implemented via county partnerships between Extension and other agencies and organizations whose mission includes promoting healthy lifestyle. These agencies and organizations include the local school system, the Coordinated School Health Program, county Health Councils, local Health Departments, food stamp offices, human resources at local businesses and industry, Boys and Girls Clubs, public housing authorities, adult community education centers and others. In many instances, professionals from the partnering organizations team teach with the Extension professionals. Using this strategy, the community receives repeated and consistent healthy lifestyle messages from the various community agencies and organizations.

There was a total of 12,540 group meetings conducted to implement *Tennessee Shapes Up* with 231,748 contacts. In addition, there were a total of 2,677 on-site visits (home or workplace) with 29,480 contacts and 7,893 direct mail or telephone delivery methods with 33,618 contacts. Extension staff communicated the diet and health methods in the *Tennessee Shapes Up* program using a variety of indirect or social marketing strategies, such as exhibits, newspapers, radio programs, TV programs and promotional materials to potentially reach 1,848,267 Tennesseans. In addition to the participants reached by Extension personnel, trained volunteers reached an additional 80,863 contacts. UT Extension also worked cooperatively with the Southern Region Economic Impact Working Group on obesity to explore protocols for evaluating program outcomes.

Impact: Impact data was collected using a behavior checklist survey. A select number of participants were surveyed to determine program impact. The behaviors measured are the healthy lifestyle practices essential in achieving and maintaining healthy weight and preventing chronic disease.

- 76% of the 13,859 participants surveyed reported they decreased consumption of sugar sweetened beverages such as soft drinks, sweetened tea, etc.

- 80% of the 14,170 participants surveyed reported they decreased intake of high fat foods such as chips, fast food, fried foods, sausage, bacon, bologna, hot dogs, etc.
- 84% of the 15,583 participants surveyed learned how to use My Pyramid and the Dietary Guidelines.
- 85% of the16, 933 participants surveyed reported they increased intake of fruits.
- 73% of the 19,266 participants surveyed reported they increased intake of vegetables.
- 83% of the 14,515 participants surveyed reported they increased consumption of dairy foods.
- 83% of the 13,398 participants surveyed reported they increased consumption of whole grains.
- 38% of the 9,167 participants surveyed reported they achieved at least 30 minutes of physical activity on most days.
- 88% of the 5,197 participants surveyed reported they used the food label to make healthier choices.
- 93% of the 4,317 participants surveyed compared prices to help manage food resources.

Of the 4,052 participants receiving food stamps reached by TSU Extension:

- 100% learned the value of healthy cooking and indicated that they will adopt healthier food choices.
- 95% indicated that they would adopt practices to have food last through the end of the month without having to seek emergency food from food pantries.
- 100% stated that they learned the importance of following food safety methods such as food handling and storage and proper hand-washing.
- 95% revealed that they had a more positive outlook in terms of changing their former practices and adopting practices they learned in the way they managed their resources.

Funding: Smith-Lever; Smith-Lever d (EFNEP); Tennessee Department of Human Resources; USDA Food Stamp Nutrition Education

Scope: State-specific

Title: Tennessee Emotional Eating Report

Issue: People often eat as a response to non-hunger cues such as emotions which can lead to overeating and overweight. Helping people to become aware of their emotional responses to food and to their body's signals for physical hunger and satiety can reduce the risk of over-eating. Children who eat often with their families have better diets than those who eat few meals with their families. They are less likely to engage in substance abuse, and they report lower levels of stress and boredom than do children who eat dinner two or fewer times weekly with their families. However, frequency of family mealtimes has decreased significantly in the last couple of decades. Helping Tennesseans to deal with these emotional and interpersonal aspects of eating can improve their diets and their quality of life.

What has been done: Extension agents conducted 72 group meetings on this topic, making 1,749 contacts. Another 2,630 persons were reached through indirect methods such as newspaper articles, promotional items, publications, and radio programs. Volunteers made 39 additional contacts.

Impact: Of the individuals participating in group meetings, questionnaires and interviews showed that:

- 1,006 of 1,037 participants (97%) learned the difference between emotional eating and eating for "true hunger."
- 391 of 3,586 participants (11%) ate at least six meals together as a family.
- 605 of 651 participants (93%) set a goal to eat at least six meals each week together as a family.

Funding: Smith-Lever

Scope: State-specific

Title: Tennessee Expanded Food and Nutrition Education Program

Issue: The major health issue effecting Americans today is the increasing prevalence of overweight and obesity. Unhealthy weight gain increases the risk for numerous debilitating diseases and conditions that lead to increased healthcare costs. In the past 20 years, national surveys have shown that Americans eat too much of refined grains and not enough whole grains. Consumption of added fats has increased and sugar consumption has nearly tripled. A poor diet combined with lack of physical activity has resulted in an increase in the number of obese and overweight Americans, particularly those that are low-income. Low-income children are reported to consume fewer fruits and vegetables, fewer whole grains, and spend more time watching television, factors believed to increase the risk of unhealthy weight gain. Low-income mothers compromise their own nutritional intake in order to preserve the adequacy of their children's diet.

What has been done: Extension's 37 EFNEP program assistants enrolled 4,080 families (14,062 individuals) in 2006. About 67% of families graduated after reaching educational objectives and 21% continued into the 2007 program year.

Impacts: EFNEP families made behavior changes in nutrition, food resource management and food safety that improved their nutritional welfare.

- 91% reported a positive change in foods they consumed by following the Food Guide Pyramid.
- Individuals reported a savings of $14.60 on their food expenditures per person, per month. This was a total savings of $39,918 per month for homemakers who graduated from EFNEP; $137,554 per month for families who graduated.

- Mean intake of protein, calcium, iron, vitamin A, vitamin C and vitamin B6 increased when diets consumed at the beginning of the program were compared to diets at the end.
- 84% (2175) of participants made improvements in one or more food resource management behaviors.
- 88% (2027) participants made improvements in one or more nutrition practices.
- 66% (1753) participants made improvements in one or more food safety practices.
- 27% of 402 participants surveyed improved their cleaning practices by washing utensils in hot water and soap after they touched raw meat, poultry and fish before using them again.
- 22% of 339 participants surveyed improved their hand washing practices before preparing food.
- 44% of 675 participants surveyed began using a meat thermometer to ensure that meat reached a safe temperature.
- 45% of 684 participants surveyed began using a refrigerator thermometer to keep the temperature of their refrigerators at 40 degrees F or below.
- 36% of 534 participants surveyed increased the likelihood that they would become more physically active.
- 45% of 677 participants surveyed increased the likelihood that they would consumer 1 ½ cups of fruit a day.
- 42% of 622 participants surveyed increased the likelihood that they would consume 2 ½ cups of vegetables.
- 45% of 672 participants surveyed increased the likelihood that they would increase their intake of low-fat foods.

Funding: Smith-Lever d (EFNEP); USDA Community Block Grant

Scope: State-specific

Title: Tennessee's Dining with Diabetes Program

Issue: Diabetes is a disabling, deadly disease and on the rise in Tennessee. It is the sixth leading cause of death in Tennessee. Over 8% of Tennesseans have reported having been diagnosed with diabetes. Diabetes is the primary cause of blindness, non-traumatic amputations of lower extremities, and kidney failure among adults. Diabetes is a daily self-management disease. Approximately three hours a year is spent with a health care professional. The rest of the year a person is left to manage their disease. Studies have shown that persons with diabetes do not know how to manage their diabetes and are dissatisfied with the lack of education from their health care providers. Without the proper education and management skills, diabetes can be frustrating and difficult to live with.

What has been done: Self-care education is the most basic tool of diabetes care. It is important that individuals with diabetes have the necessary knowledge and skills to manage their condition

and increase their potential to lead a healthy and active life. UT Extension offers Dining with Diabetes, a three class series community education program, in partnership with a variety of health care organizations such as hospitals, clinics and health departments. The program is designed to provide a social environment conducive for developing new knowledge and skills through interactive cooking demonstrations and tasting of foods, build self-efficacy through social support of others - participants and instructors - in the class, lead to other social support activities for the participants such as county support groups, walking programs and other learning opportunities and provide a recipe book and other educational resources participants can refer to after the program. This program was offered in 21 counties to 3,043 Tennesseans suffering from diabetes. An additional 907,736 contacts received information about diabetes through media activities including newspaper articles, publications, and radio and television programs.

Impact: The 745 participants who completed questionnaires reported significant improvements in understanding what foods raise blood sugar levels, the difference between healthy and unhealthy fats, and the names of foods with healthy fats. They also increased their skill levels in managing the diet by using the Healthy Plate Method, using food labels to choose healthy foods, using artificial sweeteners, eating more fruits and vegetables and choosing low-fat foods. Self-management skills improved with 74%, valuing measuring their A1c level (also known as Hemoglobin A1c, HbA1c, Glycohemoglobin, Glycated hemoglobin or Glycosylated hemoglobin) and the importance of exams including feet (61%), dental (60%), physical exams (82%). Follow-up surveys completed by 268 (85%) participants revealed they could better manage their diabetes as a result of the program. Some participants reported reduced body weight (47%), blood pressure (55%), blood cholesterol (59%) and A1c (46%) as a result of the knowledge and skills gained by participating in Dining with Diabetes.

Funding: Smith-Lever, user fees and a variety of funding at the county level

Scope: State-specific

3.2 Key Theme: Health Care

Title: Children's Environmental Health

Issue: Research studies and epidemiological reports show an alarming increase in certain childhood diseases and conditions, such as asthma and childhood cancers. While research continues in order to explain these increases, we know prudent steps should be taken to protect children from environmental threats.

What has been done: Introduced in 2004, UT Extension created and disseminated exhibits, posters and brochures in both English and Spanish. Numerous health fairs, targeted presentations and conference presentations were delivered through such events as the Tennessee Minority Health Summit, WIC, Families First, Mothers of Preschoolers, Tennessee Conference for Social

Welfare, and others. Seven counties reported 1,733 direct and 949 indirect contacts promoting EPA's Tools for Schools program.

Impact: Extension agents conducting mercury educational programs reported 555 direct and 12,826 indirect contacts in eight counties and significant knowledge gained as measured through interviews and questionnaires with direct contacts:

- 98% increased knowledge of how children can be exposed to mercury.
- 71% increased knowledge of where mercury is found.
- 60% increased knowledge on how to clean up a mercury spill.
- 54% increased knowledge of the recommendations of eating fish to minimize exposure to mercury.
- 62% increased their knowledge of the health effects on children from mercury.

Funding: Smith-Lever, U.S. Environmental Protection Agency

Scope: State-specific

Title: Improving Arthritis Self-Management Skills among Rural Tennesseans

Issue: Arthritis prevalence in Tennessee ranks among the highest in the nation. It is estimated that 1.5 million, or one of three adults in Tennessee, have some form of arthritis. Arthritis has been portrayed as an old person's disease, an inevitable part of aging that must be endured. In actuality, arthritis affects people of all ages; 45% of Tennesseans diagnosed with arthritis are under 55 years of age. Some forms of arthritis, such as osteoarthritis, can be prevented with weight control and precautions to avoid certain occupational and sports injuries. Arthritis can not be cured, but it can be controlled.

What has been done: In partnership with the Tennessee Chapter of the Arthritis Foundation and the Tennessee Department of Health's Arthritis Control Program, 55 UT Extension agents have participated in the Arthritis Foundation Instructor Training programs for Arthritis Self-Help Program and Arthritis Foundation Exercise Program. These evidence-based programs have shown a decrease in pain and stiffness, an increase in physical activity, a reduction in physician visits and a decrease in medication use. Through programs offered by UT Extension agents, rural Tennesseans now access arthritis education which will empower them to control their arthritis and reduce health care costs. Over 1,278 Tennesseans participated in the arthritis education programs.

In addition, UT Extension offered over 504 Tai Chi programs in 26 Tennessee counties reaching over 4,000 individuals. Extension educators who successfully completed the two-day instructor training have been certified and approved by the Arthritis Foundation to teach this program. The program consists of 12 movements using the Sun style of Tai Chi exercises. This form is particularly effective for people with arthritis. Research has shown that people who attend this program report reduced swelling, pain and stiffness from arthritis along with improved balance,

muscle strength, energy and confidence to engage in physical activity. The program consists of eight one-hour sessions. Extension educators also reached 907,736 Tennesseans with information about arthritis and the impact of Tai Chi on managing the disease through exhibits, newspaper articles, promotional items, publications, and radio and television programs.

Impact: Of the 1,278 Arthritis Self-Help participants, 85% of those who responded to a survey reported they felt better as a result of participating in these programs. On the last day of the program, participants completed an evaluation questionnaire. The number of participants responding to each survey statement varied. As a result of participating in the program, 70% of participants reported understanding arthritis as a chronic disease.

- 66% of participants reported less stiffness from their arthritis.
- 78% of participants reported less pain from their arthritis.
- 34% of participants reported taking less medication.
- 85% of participants reported feeling better.
- 76% of participants reported controlling their fatigue.
- 95% of participants reported they needed to add exercise to their daily routine for managing their arthritis.
- 78% of participants reported keeping a written record of all their medications to share with their doctors and pharmacist.
- 77% of participants reported knowing how to cope with feelings such as frustration, anger, sadness and depression.
- 93% of participants reported they would recommend this program to others.

After a three-month period, participants in 10 counties were sent follow-up surveys. The number of participants responding to specific statements varied.

- 63% of participants reported controlling their arthritis pain.
- 50% reported they can name the arthritis medications they are taking.
- 57% reported using pain management techniques.
- 82% reported less pain from their arthritis.
- 65% reported adding exercise to their daily routine to better manage their arthritis.

Regarding Tai Chi, a questionnaire was used at program completion to evaluate the program. The number of participants responding to each questionnaire statement varied. As a result of participating in the program:

- 90% understood the importance of exercise in managing their arthritis.
- 80% realized they needed to add physical activity to their lifestyle.
- 98% valued Tai Chi as a way to increase flexibility, reduce stress, reduce pain and improve stiffness from arthritis.
- 90% felt well as a result of Tai Chi. After a three-month follow-up, 77% reported they continued to do Tai Chi.

Thus this partnership has successfully expanded the availability and participation of these evidence-based programs to underserved, rural areas that previously had no participation and where access to health information and care is severely limited. This successful statewide partnership was awarded the Centers for Disease Control & Prevention's prestigious 2006 Partnership Award and the National Arthritis Foundation's Public Health Award for Program Innovation.

Funding: Smith-Lever; Tennessee Department of Health's Arthritis Control Program; Tennessee Affiliate of the Arthritis Foundation; User Fees

Scope: State-specific

Title: Be MedWise Tennessee

Issue: A lack of health literacy about medications is a major contributing factor to poor adherence to medication regimens, medication errors and adverse reactions to medications. Tennesseans need to learn how to make wise decisions about medications at a time when medication problems and the use of numerous medications as a daily lifestyle-activity are growing among children, teens, adults and seniors.

What has been done: The UT Center for Community-based Health Initiatives, partnership between the UT College of Pharmacy and UT Extension, has partnered with the National Council on Patient Information and Education and the Tennessee Pharmacists Association to address medication literacy in Tennessee. The focus of the partnership is to advance the safe, appropriate use of medicines through public education and communication with community pharmacists, by utilizing the statewide educational network of UT Extension and the medication expertise of the other partners. UT Extension educators in 35 counties provided educational programs and media activities to improve the medication literacy of residents in their communities; and 3,300 Tennesseans participated in educational programs addressing medication literacy. An additional 14, 907 people were reached with educational materials and media activities.

Impact: This program impacted the knowledge, attitudes, and behaviors of the 3,300 participants about taking both over-the-counter and prescription medications as stated on the label (97%); avoiding combining prescription and over-the counter medications without checking with their doctor or pharmacists first (89%); the importance of partnering with the doctor and pharmacist (85%); avoid combining pain relievers, prescription or multi-symptom medications with the same active ingredient (84%); finding the active ingredient on the label (90%); and using the UT Med Minder card to keep a record of all their medications (86%).

Funding: Smith-Lever

Scope: State-specific

Title: TEAM UP Tennessee – Improving Screening Rates among Appalachian Women

Issue: Medical service shortages, rural residence, and socioeconomic and cultural factors pose barriers to breast and cervical cancer screening among women living in the Appalachian region of Tennessee. The Appalachian region suffers from higher mortality rates due to breast and cervical cancer.

What has been done: Utilizing a partnership approach, UT Extension introduced TEAM UP Tennessee by bringing together state partners with county level community stakeholders to implement evidence-based strategies to increase breast and cervical cancer screening in eleven Appalachian counties. UT Extension's state partners included the American Cancer Society's Mid-South Division, National Cancer Institute's Mid-South Region Cancer Information Service, Tennessee Breast and Cervical Screening Program. At the county level, UT Extension educators facilitate the county partnerships, which focus on specific strategies for reaching women in their counties, and provide education. The county health departments provide the pelvic exams, Pap tests and clinical breast exams. Eligible women are enrolled in the Tennessee Breast and Cervical Cancer Screening Program and referred for mammograms.

TEAM UP Tennessee is part of an eight state partnership with the National Cancer Institute, American Cancer Society and the United States Department of Health. The goal of the partnership is to increase participation in the breast and cervical cancer screening program available through each state's Breast and Cervical Screening Program. The target audience is women who have never or rarely been screened and who are living in counties with persistently high breast and/or cervical cancer mortality.

Impact: Between 2003 and 2006, the number of women screened through the Tennessee Breast and Cervical Screening Program increased fourfold in comparison with control counties, who did not receive the educational interventions. In 2006, the program reached 398,345 women with breast and cervical cancer information. Over 1,700 women participated in educational programs. Women reported via questionnaires and interviews, they no longer were afraid to get screened for breast cancer (89%) and cervical cancer (74%). Additionally, 40% of the women who smoked reported they would stop smoking, and 91% of the respondents planned to do monthly breast exams.

Funding: Smith-Lever; National Cancer Institute; Tennessee Department of Health's Breast and Cervical Screening Program

Scope: Multistate (AL, GA, IL, KY, MS, MO, SC)

Title: Walk Across Tennessee

Issue: Regular physical activity of even moderate intensity can improve health and reduce the risk of many chronic diseases, such as diabetes and high blood pressure. Yet, half of Tennesseans are not active enough to receive the health benefits of physical activity.

What has been done: Walk Across Tennessee is UT Extension's 8-week walking program for teams of eight people. The teams have a friendly competition to see who can log the most miles walking, jogging, biking, dancing or other types of physical activity. Team members do not have to walk together. Some may prefer to walk outside, while others walk on a treadmill. They can use a variety of activities by using physical activity equivalents. Miles are recorded on a Tennessee map posted in county UT Extension offices and other places around the community or organization, so everyone can see the teams' progress. The team who walks the farthest "across Tennessee" will win, but everyone who participates will take home a healthy habit … walking for fitness. UT Extension conducted Walk Across Tennessee in 35 counties, reaching 5,337 Tennesseans. This included 561 teams, who walked 387,493 miles. An additional 319,553 Tennesseans in 33 counties were reached with information about the importance of physical activity through exhibits, newspaper articles, publications, radio and television programs, and Web sites.

Impact: The goal of the program is to help people maintain their walking after Walk Across Tennessee ends. After three months, 1,964 reported they had maintained their walking. After six-months 1,525 had a walking routine. After one year, 857 people reported they still maintained their walking routine.

Funding: Smith-Lever

Scope: State-specific

Goal 4 – Greater Harmony Between Agriculture and the Environment

4.0 Overview

4a. Results

UT and TSU Extension made 86,310 educational contacts in Goal Four programs. Impacts measured in FY 2006 were for integrated pest management (IPM), land use, water quality, forestry, wildlife and natural resources management programs. Forest products are a key component of Tennessee's economy. Forest products accounted for 6.6% of the state's economy and generated $21.7 billion in economic value. Extension programs targeted youth and forest owners, including small-scale and limited resource woodland owners. More than 1.1 billion board feet of forest products are manufactured in Tennessee annually with 3-9% lost to wood waste. Tennessee Agricultural Experiment Station research aimed at reducing wood/resin waste was conducted in 2006.

4b. Highlights

Tennessee 4-H youth were provided with opportunities to learn in the outdoors. Over 120 group events were held at the Ridley 4-H Camp Environmental Program where 4,036 youth received hands-on instruction in wildlife management and ecology. Opportunities included 4-H Wildlife Judging, the Food and Cover Establishment Program, the Wildlife Conference and Shooting Sports Camp, the Shooting Sports Program, and Target SMART Camp. A total of 658 4-H'ers participated in the 4-H Wildlife Project.

In 2006, Extension Agents from 21 counties provided 150 IPM workshops to child care providers and school officials resulting in 2,149 educational contacts for this delivery method. A total of 6,690 contacts were made by agents regarding pests, pesticides and IPM in child-serving facilities.

The RUSLE2 (Revised Universal Soil Loss Equation) erosion prediction model developed by Tennessee Agricultural experiment Station researchers in cooperation with scientists and field personnel from USDA-Agricultural Research Service and USDA-Natural Resource Conservation Service (NRCS) has now been implemented in 75 NRCS field offices across Tennessee. RUSLE2 is being used an estimated 150 times a day to compare management alternatives for their ability to reduce erosion and enhance soil quality. RUSLE2 is also being used for planning on construction sites, helping managers keep sediment from damaging streams and rivers by comparing best management practices using cost-benefit analyses.

4c. Benefits

Outcomes from 4-H natural resources management programs included:

- 430 4-H'ers from 44 counties planted approximately 215 acres of food plots improving wildlife habitat on more than 3,225 acres.

- Post-test scores were 61% than pre-test scores from 61 youth who attended the Tennessee 4-H Wildlife Conference.

Outcomes from the IPM program for child care providers and school officials were measured using participant questionnaires. Outcomes achieved included:

- 546 participants increased their knowledge on the health risks from exposures to pests.
- 544 participants increased their knowledge on the health risks from exposure to pesticides.
- 686 participants increased their knowledge on IPM strategies for controlling pests.
- 400 participants now use IPM in their home to control pests.

Tennessee Agricultural Experiment Station researchers have developed a statistical analysis program to reduce wood/resin waste in the production process. The medium density fiberboard plant used for the validation study was able to reduce wood and resin usage by means of this system, resulting in annual cost savings of $700,000 at a single test site.

Expert estimations of Tennessee Agricultural Experiment Station research initiatives in erosion modeling, no-till practice refinement, and herbicide-resistant seed development research, show an estimated contribution to Tennessee's economy of $50 million per year.

4d. Assessment of Accomplishments

The 2006 Renewable Resources Extension Act funds were again expended on programs supportive of the FY 2005 – FY 2009 RREA Strategic Plan; specifically, forest stewardship/health and wildlife/fisheries. Goal Four programs continued to support the under-served, especially through agroforestry programs delivered to the state's small-scale woodland owners. UT and TSU Extension addressed these needs with the shared intellectual and physical resources.

4e. Allocations for Goal 4

UT 1862 Research – $3,630,337 • Hatch - $374,590 • Multistate 3(c) 3 - $80,549 • McIntire-Stennis - $454,909 • State - $2,720,289	**FTEs for Goal 4 – 100.07** • UT 1862 Research – 84.4 (16.3 scientist and 68.1 non-scientist) • UT 1862 Extension – 10.3 • TSU 1890 Extension – 5.37 (4.51 professional and 1.26 para-professional)
UT 1862 Extension – $1,079,307 • Smith-Lever b and c – $153,623 • Smith-Lever d – $193,244 (IPM) • Smith-Lever d – $75,893 (RREA) • State/County – $656,547	**TSU 1890 Extension – $50,008** • NARETPA Section 1444 and 1445 – $43,974 • State/County – $6,034

4.1 Key Theme: Integrated Pest Management

Title: Integrated Pest Management in Child-serving Facilities

Issue: Pest management programs in schools need to balance and reduce the risk of unnecessary exposure to pest control products with the health risk associated with the pests. Integrated Pest Management (IPM) can help accomplish this goal.

What has been done: In 2006, Extension Agents from 21 counties provided 150 IPM workshops to child care workers and school pest management decision-makers resulting in 2,149 educational contacts for this delivery method. A total of 6,690 contacts were made by agents regarding pests, pesticides and IPM in child-serving facilities.

Impact: This program achieved these outcomes:

- 546 of 564 participants surveyed increased their knowledge on the health risks from exposures to pests.
- 544 of 564 participants surveyed increased their knowledge on the health risks from exposure to pesticides.
- 686 of 724 participants surveyed increased their knowledge on IPM strategies for controlling pests.
- 400 of 400 participants surveyed use IPM in their home to control pests.

Funding: Smith-Lever; USDA Southern Region IPM Grants Program

Scope: State-specific

Title: Fire Ants

Issue: Imported fire ants, which can inflict a painful sting, build large mounds that can interfere with agricultural commodities and machinery, attack ground-nesting birds, newborn cattle and seedlings, and damage electrical equipment, can be found in over 325 million acres in the U.S. including counties along Tennessee's southern border. About 3.9 million Tennesseans or 65% of the state's population live in infested counties and are affected by these pests.

What has been done: The Tennessee Fire Ant Research and Education Team (FARET), collaboration between the University of Tennessee and Tennessee State University Institute for Agricultural and Environmental Research, was formed in the spring of 2003. The group provided guidance in conducting seven group meeting in 2006 reaching 382 people. Agents from 11 counties reported an additional 611 face-to-face educational contacts in 2006. Tennessee has seven Extension personnel who participate in the *Taking the Sting Out of Fire Ants* Imported Fire Ant Community of Practice for the eXtension program.

Impact: Program outcomes were measured in three Tennessee counties in 2006:

- 16 of 16 homeowners increased their knowledge of fire ant management.
- 250 participants decreased environmental contamination by no longer using gasoline/diesel as a control method.
- 12 of 16 participants plan to use the two-step method around the home for managing fire ants.

Funding: Smith-Lever

Scope: Multistate (National)

Title: Household and Structural IPM

Issue: Our urban pest management programs directed at the pest management professional (PMP) and other clients such as Master Gardeners can potentially impact every resident of Tennessee. The Tennessee pest management industry is estimated to represent revenues of approximately $150 million annually. More than 5,500 pest management technicians are certified to provide urban pest services to the residents of the state. Adoption of integrated pest management (IPM) in and around structures will reduce and balance the risk of exposure to pest control products with the health risk associated with the pests, provide effective pest control and sustain the pest management industry.

What has been done: In 2006, UT Extension conducted more than 111 PMPs were trained in IPM through 12 videotaped and interactive TV sessions for pesticide applicator training in category 7:Industrial, Institutional, Structural and Public Health Related Pest Control. Bed bugs, brown recluse and other spiders, odorous house ants, and wood-boring beetles and other wood-destroying organisms were topics presented in eight group meetings to 1,686 PMPs and others. A training program that prepares PMPs for the Department of Agriculture's licensing examinations was given four times in 2006 for wood-destroying organisms (WDO) to 45 PMPs; four times for general rodent and pest control (GRC) to 41 PMPs and once for Public Health Management - Mosquito Control (PHMC). Two lectures, *Biology of Termites*, and *Other Wood-destroying Insects and Their Damage*, were provided to 44 PMPs during three Termite Technician schools that are conducted in cooperation with the Tennessee Department of Agriculture and pest management industry representatives. Demonstrations in ant and termite control were conducted to explore new strategies for controlling these pests.

Pest identification is one of the key steps to managing pests. Before management decisions can be made, the pest must be properly identified. Our Knoxville Urban IPM lab personnel identified 219 household, structural, landscape and vegetable pests in the lab or through the UT Extension Distance Diagnostics Web Site. County Extension Agents in 24 counties made 3,561 contacts through client visits to the local Extension office, mail/phone/e-mail, group meetings and on-site visits regarding household and structural IPM. IPM information was also disseminated through

publications (printed and electronic), mass media (newspaper, newsletters, TV), phone calls, e-mails, office visits and other meetings.

Impact: Training, in cooperation with the UT Pesticide Safety Education Program, is provided quarterly to PMPs preparing to take the Wood-Destroying Organism (WDO) and general rodent and pest control (GRC) licensing exams. Averaged over all years since its inception in 2002, quiz scores in WDO (n=18 sessions) and GRC (n=20 sessions) have increased from pre- to post-training by 20 ± 4% and 25 ± 8%, respectively. In October of 2006, the Tennessee Department of Agriculture provided pass and fail rates for UT-trained and untrained PMPs taking the GRC and WDO licensing exams. Our training program was successful; 100% of UT-trained examinees passed the GRC exam, while only 87% of those not trained by UT passed; 71% of the UT-trained examinees passed the WDO licensing exam while only 50% of those not trained by UT passed. An educated PMP will provide better and safer services.

The odorous house ant, *Tapinoma sessile* (Say), is the principal ant entering structures in the mid-south region of the U.S. and was ranked as the number two pest ant in the country in 2003. Our urban IPM program has developed successful strategies for managing odorous house ants. This success has brought our program national recognition as we were requested to speak on this subject to 888 PMPs in the nation to provide solutions to a problem that has been plaguing PMPs for years. PMPs will now be able to satisfy and retain their clientele. Our expert estimation is that we saved at least one odorous house ant account for each of these contacts, making our strategies worth at least $355,000 to the pest management industry.

Funding Sources: Smith-Lever; Tennessee Department of Agriculture; Contracts; Gifts

Scope: State-specific

Title: Tennessee Cotton and Soybean IPM Success

Issue: In 2006, Cotton was grown on 690,000 acres and soybeans planted on over 1 million acres in Tennessee.

What has been done: Significant IPM training programs were implemented or continued in 2006. An in-season, multidisciplinary IPM Newsletter was distributed weekly to growers, Extension agents and other agricultural professionals. Methods of distribution include on-line access, email distribution to about 400 individuals, and direct mail. The newsletter is also picked-up and distributed by private organizations, such as agfax.com. At least 1,000 individuals receive the IPM Newsletter weekly.

Cotton and soybean IPM training schools were used to educate about 120 pest managers in 2006. These schools include intensive training on arthropod identification, biology, damage symptoms and management (as well as information about the management of non-insect pests). Other topics are plant growth and development and proper and safe use of pesticides.

Pest management training programs are also presented at county and state meetings targeting various clientele groups. Cumulative attendance at these meetings exceeded 2,000 individuals in 2006. Multiple publications are prepared or revised annually on topics related to IPM in field crops, including cotton and soybean. Approximately 1,000 copies of the Cotton Insect Control Recommendations were distributed to clientele groups.

Extensive testing of various IPM technologies is performed annually. The results of this research are published on-line via UT Extension websites. Research includes insecticide testing, evaluation of resistant varieties, and validation or development of new sampling and treatment thresholds. For example, regional efforts in the Mid-South have been underway for two years to evaluate plant bug and stink sampling procedures and thresholds. These have become the primary pests in cotton because of boll weevil eradication and the adoption of Bt-transgenic varieties.

Impact: A survey of 57 cotton growers and pest managers indicated that:

- 78% had changed production practice related to insect control based on UT information
- 67% made changes in pest control tactics related to weed management
- 37% made changes to control plant pathogens.

The 57 growers were asked to place on dollar value on information about cotton pest management supplied by UT (which would include insect, weed and disease control). 58% indicated $20 or more per acre. As a testament of recent improvements in the adoption of IPM practices, the highest ever cotton and soybean yields have been recorded in the last three years (with corresponding reductions in pest related crop losses and insect control costs).

Funding: Smith-Lever; Hatch

Scope: Multistate (AR and MS)

4.2 Key Theme: Land Use

Title: Soil Erosion Prevention

Issue: Soil losses of 8-13 tons per year on some soil-slope combinations under conventional tillage regimes are unsupportable – soil is conservatively valued at about $6 per ton, land health is severely compromised, and degradation to nearby lands and waterways is often catastrophic.

What has been done: Soil erosion has been dramatically reduced since no-till first took hold. Some of the underlying causes include Federal conservation compliance regulations, the advent of no-till practices, improved soil erosion models, and herbicide-resistant seeds that reduce tillage.

Tennessee Agricultural Experiment Station researchers have found that as Tennessee cotton farmers adopt herbicide-resistant seed they are also more likely to increase no-till and other conservation tillage practices.

The RUSLE2 (Revised Universal Soil Loss Equation) erosion prediction model developed by Tennessee Agricultural Experiment Station researchers in cooperation with scientists and field personnel from USDA-Agricultural Research Service and USDA-Natural Resource Conservation Service (NRCS) has now been implemented in 75 NRCS field offices across Tennessee. RUSLE2 is being used an estimated 150 times a day to compare management alternatives for their ability to reduce erosion and enhance soil quality. RUSLE2 is also being used for planning on construction sites, helping managers keep sediment from damaging streams and rivers by comparing best management practices using cost-benefit analyses.

Impact: We estimate that the introduction of herbicide-resistant cotton seed indirectly reduced soil erosion from Tennessee cotton land by a total of 9 million tons ($52 million) in the most recent six-year study period (1997 to 2004), as farmers adjusted tillage practices. This annual economic impact of $8.5 million (1.5 million tons of soil) should persist as long as this low-tillage practice remains viable.

For row crops in general, improved management practices have saved an estimated 22 million tons of soil each year. This is a savings of $124 million per year in Tennessee, based on 84% (2.2 million acres) of Tennessee row crops under some form of no-till or conservation tillage, resulting in an average of about 10 tons less loss per acre per year, compared to numbers without these practices. If perhaps 40% of this savings is due to Tennessee Agricultural Experiment Station erosion modeling, no-till practice refinement, and herbicide-resistant seed development research, our total contribution is in the neighborhood of $50 million per year.

Funding: Hatch

Scope: State-specific

4.3 Key Theme: Water Quality

Title: Clean Water in Tennessee

Issue: Water quality and quantity issues are among the most urgent in Tennessee. Every citizen in the 95 counties across the state, rural and urban, relies on safe, adequate supplies of water for domestic, agricultural, industrial, commercial, and recreational uses.

What has been done: UT Extension conducted 40 educational meetings and made over 500 individual contacts, reaching over 4,000 Tennesseans face-to-face with recommended practices for cleaner water. Extension faculty prepared aquatics study materials for regional and state Envirothon competitions; 798 high school students participated. A two-day workshop on water

quality issues along the rural-urban fringe was conducted; 35 Tennesseans participated. These direct contacts were reinforced with publications, mass media, and web based educational materials which reached over 70,000 Tennesseans in 2006.

Impacts: Written surveys of randomly selected workshop participants were used to evaluate the Clean Water program. Outcomes reported include:

- 66 participants know the amount of water they need on hand for emergency use.
- 47 livestock and poultry producers increased their knowledge of how animal waste impacts the environment.
- 5 livestock producers developed a nutrient management plan.
- 52 persons adopting BMPs to control erosion, nutrient and pesticide run-off and other potential sources of water pollution.
- 22 producers adopted improved irrigation management practices that protect Tennessee surface and groundwater.
- 914 producers carried out recommended practices to improve environmental integrity of cattle operations.
- 100% of the 35 rural-urban workshop participants surveyed increased their knowledge of water quality issues and recommended practices to protect and improve water quality.

Funding: Smith-Lever 3 b and c; USDA-CSREES 406 Integrated Water Quality Program

Scope: State-specific

4.4 Key Theme: Forestry/Natural Resources Management

Title: Keeping Small Woodland Owners Alive Workshops in Western Tennessee

Issue: Tennessee has 13 million acres of forests, of which 80% is owned by private, non-industrial landowners. Tennessee leads the nation in production of hardwood flooring and is one of the nation's leading exporters of hardwood lumber. In Tennessee, forest land ownership is a significant family asset. According to the Tennessee Statistics, small size forest woodlands (between 1 to 100 acres) represent 48% of all forest land types. Many of these small wood lands have trees with marginal timber value and may only have value as fuel wood. Generally in Tennessee, landowners with small-to-mid-size holdings are underserved and limited resources (that is, they are: African American, females and others who have not taken advantage of available federal, state, and local services). Like many other southern states, landowners with small- to mid-sized tracts in Tennessee, generally lack forestry knowledge and training, thus making their lands less productive and more often neglected than other ownership categories. These challenges are particularly acute among minorities, females, and other landowners not generally served by current federal, state, and local programs. Landowners are frequently unfamiliar with the maze of federal and state agencies and programs available to them and thus make limited use of these resources. Additionally, landowners are either unaware of, or perceive they cannot afford to pay for, private consulting services.

What Has Been Done: In 2006, TSU Extension in collaboration with the Tennessee Department of Agriculture Division of Forestry and UT Extension conducted a three-day "Keeping Landownership Alive" educational program in Hardeman and Haywood counties to address the challenges facing underserved and limited resource small farms and wood landowners. The three sites selected were: Bolivar in Hardeman and Stanton and Brownsville in Haywood County with 58 minority landowners and other stakeholders participating. A DVD was developed from the workshops showing landowners' participation in hands-on exercises and discussions of various issues related to their knowledge of their wood lands.

Impacts: As a result of this effort,

- 58 minority landowners and other stakeholders learned best practices for managing their small wood lands.
- Two minority landowners have developed business plans to establish non- forest-products enterprises (to produce shiitake mushrooms and golden seals).
- 10 landowners have applied to be assisted in developing stewardship plans.
- A landowner focus group was established with the vision to become a landowner association in the future; and the group identified future educational program topics targeting this audience: basic estate planning, conservation easements, agroforestry and mobile information technology transfer.

Funding: NARETPA Section 1444 and 1445; Smith-Lever d (RREA)

Scope: State-specific

Title: Preserving Forest Health

Issue: The Great Smoky Mountains National Park provides economic, environmental, and aesthetic benefit to the region. Its popularity was evident by the 9.3 million people who visited it during 2006. Unfortunately, the health, vitality, and appearance of the Park is currently negatively impacted by invasive exotic insects (e.g., hemlock woolly adelgid, elongate hemlock scale, and beech scale), weeds (e.g., Chinese yam, kudzu, and Japanese stilt grass), and plant diseases (Sudden Oak Death, dogwood anthracnose, and beech bark disease).

Loss of tree species would change the composition of forests comparable to the loss of the chestnut tree during the 1930's by dramatically destroying habitats used by invertebrates and mammals.

What has been done: Tennessee Agricultural Experiment Station researchers are developing specific procedures to protect and enhance forest health, not only in the Park but in all forested areas throughout the southern Appalachians.

Impact: Based on about nine million visitors, with three members per family, and each family spending about $150, the value of this research is estimated to exceed $22 million annually, based on a conservative estimate of a 5% reduction in tourism due to forest health decline. This estimate is much greater (in excess of $30 million annually) when recreational activities, nursery trade, urban management, forest industry, and private property values are considered.

No economic values are available for loss of species and environmental impact.

Funding: Hatch

Scope: State-specific

Title: Natural Resources Stewardship through 4-H Wildlife Management

Issue: As urban encroachment reduces rural areas, Tennesseans become disconnected with the land ethic. Many modern-day landowners are ignorant of how to take care of their land in a sustainable fashion, let alone care for our natural and wild resources as responsible stewards. This ignorance trickles down to future generations as they are less exposed to the outdoors and outdoor activity.

What has been done: Tennessee 4-H youth were provided with opportunities to learn in the outdoors. Over 124 group meetings were held at the Ridley 4-H Camp Environmental Program where 4,036 youth in public, private and home schools receive hands-on instruction in wildlife management and ecology. Opportunities included 4-H Wildlife Judging, the Food and Cover Establishment Program, the Wildlife Conference and Shooting Sports Camp, the Shooting Sports Program, and Target SMART Camp. A total of 658 4-H'ers participated in the 4-H Wildlife Project.

Impact: Outcomes from 4-H natural resources management programs included:

- 4-H Wildlife Judging involved 167 youth from 25 counties. All youth learned about the relationship between wildlife and habitat as shown by judging scorecards and observations from their coaches.
- 430 4-H'ers from 44 counties planted approximately 215 acres of food plots improving wildlife habitat on more than 3,225 acres.
- 61 youth increased knowledge in wildlife and fisheries management and shooting sports at the 4-H Wildlife Conference and Shooting Sports Camp. In fact, post-test scores were 34% higher than pre-test scores.
- 23 of the 28 campers who were previously uncertified earned a Tennessee Wildlife Resources Agency Hunter Safety Certification.

The environmental programs offered at the Ridley 4-H Camp were evaluated by follow-up discussions with schools teachers and parents who chaperoned the youth. Comments included:

- "I think the 4-H Program is an excellent way to teach kids how to build the foundation for a very healthy and productive life."
- "I chaperoned my son and his 4th grade class. I noticed the next afternoon [after the program] he wanted to go outside and explore the creek behind our house, something I've tried to get him to do since we moved there. I know it is because the 'crazy critter guy' made the hike experience so interesting that he now wants to see what he can find in our back yard!"

Funding: Smith-Lever; Tennessee Wildlife Resources Agency; National Wild Turkey Federation

Scope: State-specific

Title: Wood Waste Reduction

Issue: Forest products are a key component of Tennessee's economy. Forest products accounted for 6.6% of the state's economy and generated $21.7 billion in economic value (2000). Over 180,000 Tennesseans are employed by the forest products industry in the state. Tennessee is the leading producer of hardwood flooring and is ranked second in the U.S. in hardwood lumber production. In 2000, more than 1.1 billion board feet of forest products were manufactured in Tennessee, of which 3% to 9% were lost to wood waste. High levels of wood waste lead to poor fiber recovery, higher raw material use, higher energy use, and unwise use of precious forest resources.

What has been done: Tennessee Agricultural Experiment Station researchers have developed a statistical analysis program to reduce wood/resin waste in the production process.

Impact: The medium density fiberboard plant used for the validation study was able to reduce wood and resin usage by means of this system, resulting in annual cost savings of $700,000 at a single test site.

Funding: Hatch

Scope: State-specific

Title: Tennessee Cooperative Agricultural Pest Survey

Issue: Information is needed relative to the status of endemic and exotic pests in Tennessee. This documentation of pest range supports the export of U.S. agricultural products by establishing pest free zones. Another primary objective of the Cooperative Agricultural Pest Survey program is to further the Homeland Security Initiative by safeguarding our nation's food and environmental security from exotic pests and bioterrorism that threaten our production and ecological systems.

What has been done: The Emerald Ash Borer (EAB) and other exotic wood boring insects have become established and killed tree species in northern states. It was found that these insects emerged from wood shipping crates that were discarded after goods were received from China and other Asian countries. Recently these exotic insects have been found to move in firewood. Since the Greta Smokey Mountains National Park is a major destination for campers and sports enthusiasts, an educational and firewood survey blitz was conducted in east Tennessee campgrounds and parks to determine if ash firewood is transported to this area.

UT Extension personnel, state and federal inspectors have been educated on how to identify these exotic wood boring pests. 108 campgrounds including private and State campgrounds, and campgrounds in the Great Smokey Mountains National Park were visited during this blitz. Park and campground managers were educated through firewood posters, magnetic bumper stickers, a packet containing EAB facts, maps showing the current pest distribution, and brochures containing symptoms and identification characteristics. It was also stressed that if they encountered any quarantined firewood that it should be burned immediately.

Impact: The week-long blitz resulted in four ash firewood seizures in the Bristol, Tennessee area. An official NASCAR (National Association for Stock Car Auto Racing) race was scheduled in Bristol for the weekend just after the blitz (Saturday, August 26, 2006). These seizures were from campers who were following the NASCAR races held the previous weekend in Michigan. Unknowingly, the timing for this blitz was perfect for this attraction. This educational blitz demonstrated that firewood is moved by campers as they travel from northern states to camp in east Tennessee. As a result, the NASCAR schedule for next year will be monitored and another firewood blitz will be conducted in the Bristol Tennessee area campgrounds prior to the race to protect Tennessee's forest resources.

Funding: Smith-Lever; Hatch; USDA APHIS PPQ CAPS Cooperative Agreement

Scope: State-specific

Title: Modern Forest Management

Issue: Tennessee landowners need to adopt modern forest management techniques to create both environmental and economic sustainability.

What has been done: UT Extension partnered with the West Tennessee Chapter Society of American Foresters and the U.S. Department of Agriculture to invite members of local county forestry associations to view modern forest management practices and research at the West Tennessee Research and Education Center. Education was provided to 96 landowners from 13 counties through demonstrations of hardwood restoration, beaver damage control, native warm season grasses, and pine and hardwood thinning. The participants owned on average 569 acres of forestland

Impact: Participants were asked through an end-of-program questionnaire to estimate the economic impact of the practices they planned to adopt after the program. The 96 participants indicated the value of the program to average $96 per acre. Thus the total value of the program per participant was $29,017. When applied to the 96 participants, the total program impact was $2,785,632. When asked if they would incorporate the management practices into their land, 82% indicated they were planning to adopt practices.

Funding: Smith-Lever

Scope: State-specific

Title: Quality Deer Management in Tennessee

Issue: White-tailed deer have become overpopulated in several areas across Tennessee and exceed the carrying capacity of available habitat. Where agriculture is practiced, overpopulated deer herds can decimate crops, reducing yield and lowering profits. Homeowners in these areas also suffer as deer feed upon ornamental flowers and shrubbery. Fortunately, hunters want to harvest additional deer, as well as larger, older bucks, and are willing to pay for an opportunity to hunt.

What has been done: UT Extension initiated quality deer management on several areas in Tennessee between 1999 and 2003, including two properties experiencing crop depredation, two properties suffering ornamental damage, and one UT Research and Education Center. At each property, UT Extension personnel took a census of the deer population and provided harvest recommendations to lower the population and even the sex ratio. Additional recommendations were made regarding ways to increase the average age and size of the buck population.

Impact: In 2006, follow-up visits were conducted on each site to determine the extent to which the practices were adopted and to identify program improvements and/or impacts. Soybean yields doubled within three years after deer density was lowered on one producer's property, while soybean depredation decreased 95% on the other producer's property. Ornamental damage was all but eliminated on two private properties that averaged 350 acres within four years after implementing quality deer management, saving homeowners $1,000 – $10,000 annually in replacement value for home landscaping. Deer harvest per hunter has increased nearly 300% and the average age and size of bucks harvested has more than doubled.

Funding: Smith-Lever; Quality Deer Management Association; Tennessee Farm Bureau Federation

Scope: State-specific

Goal 5 – Enhanced Economic Opportunity and Quality of Life for Tennesseans

5.0 Overview

5a. Results

UT and TSU Extension have used input from the State Extension Advisory Council, as well as assessment data from multiple advisory groups and data indicators from the research-base including government sources to describe individual, family and community needs. Programs were conducted to address these needs, including programs in parenting education, child care provider education, 4-H civic engagement, volunteerism, and home environmental quality and safety. In FY 2006, UT and TSU Extension made over 1.4 million direct educational contacts in Goal Five programs.

Assessment data from the State Extension Advisory Council and the state's 95 county agriculture committees identified two needs relative to Goal Five programs for emphasis in FY 2006-2010: (1) building and sustaining personal and family financial skills, and (2) preparing youth for the workforce. As a result of this input, the Tennessee Saves program was conducted in 41% of Tennessee counties. The 4-H Workforce Preparation program was conducted in 25% of Tennessee counties in FY 2005, and the program was expanded to 85% of Tennessee counties in FY 2006.

5b. Highlights

UT and TSU Extension made 166,836 educational contacts to help youth gain new knowledge, acquire new skills and change aspirations regarding workforce preparation. Curriculum was selected and programs implemented to help youth attain basic work skills and personal attributes in two critical workforce competencies: achieving goals and communicating. 4-H Workforce Preparation programs were delivered through more than 6,000 group meetings conducted by Extension agents and volunteers.

The Tennessee Saves program instructs participants in financial security through saving, investing and discharging credit. The program utilized 3,576 volunteers participating in local and area coalitions. The program had 52,329 direct (face-to-face) adult contacts and 53,028 direct (face-to-face) youth contacts. An additional 1.9 million Tennesseans were reached with the financial security message through media and exhibits.

5c. Benefits

In the 4-H workforce preparation program, 43,049 youth were involved in programs focused on developing beginning skills and aspirations in communicating. Completed questionnaires were obtained from 8,274 youth (19% of the total program participants). Benefits from this 4-H program included these outcomes:

- 78% report they can now use technology to help themselves express ideas.

- 74% report they can now deal with their nervousness when giving a speech or talk.
- 71% report they now feel comfortable sharing their thoughts and feelings in a speech or talk.
- 67% report they can now name at least five jobs in which communication skills are important.

End-of-program and follow-up evaluations showed that 51% of Tennessee Saves participants increased their savings or investment. Increases averaged $44.82 per month, for a total estimated savings/investment generated as the result of program participation across the state of $6,152,082 annually. In addition, end-of-program and follow-up evaluation showed that 54% of participants reduced their debt. Reductions averaged $66.36 per month, for a total estimated debt reduction generated as the result of program participation across the state of $9,644,628 annually.

5d. Assessment of Accomplishments

UT and TSU Extension continued their strong tradition of exemplary evaluation of Goal 5 programs. In FY 2006, UT and TSU Extension adopted an aggressive approach to program planning and evaluation. The effort was guided by use of the custom-built reporting software, the System for University Planning, Evaluation and Reporting (SUPER). SUPER supported a faster and more efficient analysis of statewide needs assessment data as well as faster delivery of research-based program resources to local Extension agents. Program plans in SUPER were organized with the logic model concept with research citations built into the plan. The result was more educational programs focused on statewide problems, research-based solutions to those problems, and outcomes to measure program impact. In addition, the UT and TSU Extension emphasis on program evaluation has had a compounding effect because evaluative data is utilized to improve programs, which then produce greater results for children, youth and families.

5e. Allocations for Goal 5

UT 1862 Research – $1,512,046 •Hatch - $327,026 •State - $1,116,129 •Multi-State 3(c)3 - $68,891	**FTEs for Goal 5 – 285.51** •UT 1862 Research – 34.6 (10.1 scientist and 24.5 non-scientist) •UT 1862 Extension – 241 •TSU 1890 Extension – 9.91 (7.72 professional and 2.59 para-professional)
UT 1862 Extension–$19,038,962 •Smith-Lever b and c – $3,610,118 •State/County – $15,428,844	**TSU 1890 Extension – $1,175,186** •NARETPA Section 1444 and 1445 – $1,033,392 •State/County – $141,794

5.1 Key Theme: Financial Security for Tennesseans

Title: Tennessee Saves

Issue: Because they spend too much and save too little, many Tennesseans will not have enough money to live securely throughout life. Over the next 20 years, the percentage of retirement-age Tennesseans is expected to almost double; however, currently 52% of the U.S. workforce has no private pension coverage and 31% has no savings set aside specifically for retirement. The household debt load is also growing across the country, particularly among young people just starting out on their own and older people in early retirement.

What has been done: The Tennessee Saves program teaches personal savings and financial management. The program was conducted in 39 counties in 2006. A total of 3,576 volunteers participated in Tennessee Saves activities through local and area coalitions and partnerships. Counties reported 52,329 direct (face-to-face) adult contacts and 53,028 direct (face-to-face) youth contacts, including 44,858 contacts via 1,234 group meetings and financial education programs. An additional 1.9 million Tennesseans were reached with the message of the importance of savings through media and exhibits. New Tennessee Saves Coalitions were developed in three counties, bringing the total number of active local or area coalitions to 10 statewide. More than 5,000 youth and adults have enrolled as Tennessee Savers. UT Extension and its state partners conducted Tennessee Saves Days at Legislative Plaza and leaders testified before the Education Committee on the need for financial education.

Impact: Post program surveys of participants in group educational sessions indicated that:

- 86% of participants reported that they increased their financial management skills.
- 91% felt more confident that they could build wealth.
- 71% became more motivated to begin or increase contributions to savings or investment plans.
- 88% identified ways to increase savings.
- 91% identified ways to reduce debt.

Follow-up surveys of participants in group educational sessions indicated that:

- 65% followed a spending plan.
- 65% kept a record of spending.
- 95% set financial or retirement goals.
- 70% made a change in a financial practice to avoid being a victim of fraud or predatory practices.
- 51% increased their savings or investment. Increases averaged $44.82 per month, for a total estimated savings/investment generated as the result of program participation across the state of $6,152,082 annually.

- 54% reduced their debt. Reductions averaged $66.36 per month, for a total estimated debt reduction generated as the result of program participation across the state of $9,644,628 annually.

Funding: Smith-Lever

Scope: State-specific

Title: The Changing Workplace

Issue: Changing employment patterns challenge many workers' ability to earn an adequate and stable income, plan for a secure retirement, finance health care, respond to family needs and control stress. Workplace changes over recent years have affected the financial security and the quality of life for individuals and families. Specifically, workplace mobility and temporary employment, decreasing benefits, and longer working hours are issues. In addition, the decreasing number of employees with actual pension plans as opposed to defined contribution plans makes retirement less secure.

What has been done: UT Extension implemented The Changing Workplace program in five Tennessee counties in 2006. A total of 69 human resource and other volunteers participated in worksite financial education programs. Agents reported 1,846 direct contacts, including 1,746 contacts via 85 group meetings and financial education programs. An additional 14,113 Tennesseans were reached through media and exhibits. UT Extension also organized the first *Securing the Future of Tennessee's Workplace Conference*, with 70 participants from Extension, government, the financial community and business.

Impact: Post-program surveys of participants in group educational sessions indicated that

- 56% of participants estimated their retirement income needs.
- 33% of gained knowledge about the relative advantages and risks of different investment options.
- 83% of participants made a plan for building financial assets for a secure retirement.
- 100% of participants made changes in their finances or financial behavior to increase return or reduce risk of their investments.
- 65% of participants set retirement goals.
- Total estimated savings/investment generated as the result of program participation across the state is $239,462 annually.
- Total estimated debt reduction generated as the result of program participation across the state is $375,401 annually.

Funding: Smith Lever; user fees

Scope: State-specific

5.2 Key Theme: Community Development

Title: Land Ownership Information Project

Issue: Land ownership is a traditional part of the "American Dream." Owning land, cultivating it, and using it to provide for one's basis needs are fundamental components of this dream. Land is a great source of wealth in the African-American community. In addition to providing economic stability, land ownership is highly correlated to one's social and economic well-being. According to 2002 Census of Agriculture there are 1,266 African American farm land owners in Tennessee controlling 129,766 acres. Land ownership tied to farming in general has decreased greatly. The exodus of African Americans from the land has been caused by a number of factors, many of them economic, institutional, and legal. Many obstacles have been faced by black farmers in their efforts to remain in farming and to retain ownership of their land. The loss of land points to the need for an intensive educational program that will address estate planning, making wills, getting free legal help, and property ownership rights and responsibilities.

What Has Been Done: Land ownership educational information has been prepared and provided to African American farmers through fact sheets and group meetings. Four fact sheets were developed on wills, adverse possession, mineral and air rights, and eminent domain. Five fact sheets were developed for Small Businesses. Three land ownership workshops were conducted this year in Hardeman, Haywood, and Tipton County. Three in-services were conducted on estate planning with agents from all geographic regions of the state. Two seminars on small businesses were conducted in Haywood and Dyer County.

Impact:

- 69 landowners and farmers increased knowledge on estate planning, legal issues, heir property, and government land programs.
- 84 Extension agents gained more knowledge about writing wills, the importance of estate planning, and retirement planning.
- 30 aspiring business owners increased their knowledge on starting a business, liability issues, business tax, retirement plans for self employed, insurance, and record keeping.

Funding: NARETPA Section 144 and 1445

Scope: State-specific

Title: Entrepreneurship

Issue: Data obtained for the 2002 U.S. Census indicates a total of 26,811 Black or African American owned businesses; 3,565 American Indian and Alaska Native owned businesses; 7,241 Asian owned businesses; and 9,430 Hispanic/Latino owned businesses in Tennessee. There is a growing need to provide continuing education for start-ups as well as established farm and non-

farm businesses in Tennessee. Job security and benefits are at stake for not only new employees with little experience, but also veteran or senior professional and wage workers. Industrial plants are closing their doors in Tennessee and relocating in other areas outside the state. These actions hurt our local economy, increase unemployment and put many minority individuals and family members at risk by ending insurance coverage. Some employers are offering early retirement to employees. According to a Memphis newspaper, *The Commercial Appeal,* newsroom employees with 20 years experience and at least 40 years of age were offered early retirement. These employees were replaced by volunteers. Tennesseans whether retired, laid-off, or looking to make a better life for themselves and their family are seeking information for entrepreneurship and small business development.

What has been done: A total of four workshops were conducted by TSU in Haywood, Dyer and Hardeman counties (Tennessee) and Clay County (Mississippi). Business plans were developed for business owners in Hardeman County and a marketing plan was implemented by a business owner in Cheatham County. The "Creating Business Success" manual was created as a resource guide to assist Tennessee entrepreneurs. Business planning software was purchased to assist the TSU specialist in developing professional plans for clients. Support materials such as resource books have been obtained as a reference for research-based information.

Impacts:

- 112 participants gained knowledge of how to create a business idea, prepare a business plan and use it as a guide, establish a team of professionals (attorney, accountant), prepare business filings, and set up an accounting system.
- 112 participants learned how to use record keeping, business planning, business ownership training, and management skills to their advantage.

Funding: NARETPA Section 144 and 1445; USDA Rural Business Cooperative Service Grant

Scope: Multistate (MS)

Title: Urban Programs for Youth Development

Issue: The urban sprawl is met by a myriad of challenges. This is particularly critical as many citizens deal with such issues as increased rates of crime; heightened rates of poverty; community resource and economic challenges; unemployment and underemployment; language and cultural barriers; increased incarceration rates; deteriorating buildings and communities; and educational short comings. The changing demographics make it more crucial than ever to provide quality, research-based educational opportunities to individuals and families.

What has been done: Child development sessions were conducted for 20 pregnant teens and young adults at the Incredible Baby Shower sponsored by Metropolitan Health Department. Nearly 200 teens from four high schools participated in a series of college prep and workforce readiness sessions. Such topics as effective communication, positive thinking and positive self-talk,

leadership, and business and personal etiquette were addressed. Over 170 third and fourth graders participated in the Hip-Hop in the City After School Program. Youth learned about the origins of Hip-Hop, how it has changed, decision making, conflict and conflict resolution, stress and stress management, and communication. Role playing and other interactive strategies were used to reinforce concepts and ideas. In addition, stress management education was provided for 75 middle school teens.

Impact: Of the 200 teens in the college prep and workforce development programs,

- 85% learned new ways to think about themselves in a positive manner.
- 82% learned new information about communicating effectively.
- 90% reported that they would use the information learned in their daily lives.

Of the 75 middle school females in the stress and stress management program,

- 100% of the participants reported that they will use the information learned to help manage stress.
- 100% reported that they can share the stress management tips with friends and family members.
- 100% could name 2 positive and 2 negative ways to deal with stress.
- 50% reported learning new information about stress and stress management.

Funding: NARETPA Section 1444 and 1445

Scope: State-specific

Title: Dyer County's Community Resource Development

Issue: Needs for Dyer County communities, especially individuals from limited-resource households, include leadership development and community services.

What has been done: TSU Extension conducted 12 monthly community resource development meetings. These meetings covered mostly economic development issues that confronted limited resources families. Three housing meetings were held providing information to first time homebuyers. Three small business workshops were held providing information to small and minority businesses.

The Community Resource Development Committee held an awards program with over 275 people attending to recognize community members for their work in community development. The group provided 30 awards and scholarships to students coming from limited resource families. Awards were presented to individuals from limited resource families and organizations to continue their efforts of improving conditions in their communities.

The Special Summer Food Service Program for children was held during four summer months with 608 youth that participated in the Summer Feeding Program; 369 females and 239 males; 47

Caucasians and 561 African Americans. Lessons that were taught were on the importance of making wise food choices and proper hand washing techniques.

Impact: Four citizens who are part of the Community Resource Development committee now serve on City and County Government Boards. Follow-up interviews and evaluation of the Special Summer Food Service Program showed that, of the 608 youth participants:

- 100% gained knowledge about the value of eating a nutritious food.
- 100% gained knowledge of the importance of good hand-washing practice.
- 83% indicated that they had begun eating a variety of foods.
- 83% said they had begun making better food selection.
- 100% said they had adopted behavior changes such as more frequent hand washing.

Funding: NARETPA Section 1444 and 1445

Scope: State-specific

5.3 Key Theme: 4-H Workforce Preparation

Title: Tennessee 4-H Workforce Preparation – Achieving Goals and Communicating

Issue: Youth in Tennessee need the skills, experience and confidence necessary to meet the demands of the workplace and succeed in a high-performance economy characterized by high-skill, high-wage employment. According to the Tennessee Department of Education, many students graduate from Tennessee high schools without the skills and attitudes needed to get and hold a job. The SCANS Report identifies a three-part foundation of skills and personal qualities needed for solid job performance.

What has been done: UT and TSU Extension made 166,836 educational contacts to help youth gain new knowledge, acquire new skills and change aspirations regarding workforce preparation. Curriculum was selected and programs implemented to help youth attain basic work skills and personal attributes in two areas, achieving goals and communicating. 4-H workforce preparation programs were delivered through 6,168 group meetings including organized clubs, camps, project groups and school enrichment by Extension 4-H agents and volunteers.

Impact: 23,606 youth were involved in programs in which an outcome evaluation was conducted of their practices toward achieving goals. Intact groups of 4-H youth were randomly selected for post-test only questionnaires. The questionnaires were valid and reliable instruments from the Tennessee 4-H Life Skills Evaluation System, an online tool to measure and evaluate the outcomes of statewide 4-H youth development programs. The questionnaires used a five part scale (never, rarely, sometimes, often and always) to determine achieving goals behaviors at the beginning, intermediate and advanced levels after the program. A typical questionnaire item would be phrased "*Because of my 4-H experiences*, I work to achieve my goals."

17,499 youth were involved in programs focused on beginning skills and aspirations as they relate to achieving goals. Completed questionnaires were obtained from 3,967 youth (23% of the total program participants). The following beginning outcome indicator data was obtained.

Because of their 4-H experiences,

- 77% report they now work to achieve their goals.
- 74% report they now set high goals.
- 70% report they now look at the steps needed to achieve a goal before setting it.
- 61% report they now break their goals down into steps so they can check their progress.

5,788 youth were involved in programs focused on intermediate skills in achieving goals. Completed questionnaires were obtained from 1,341 youth (23% of the total program participants). The following intermediate outcome indicator data was obtained.

Because of their 4-H experiences,

- 65% report they now know where they want to end up and usually plan how to get there.
- 62% report they have set a goal for their job or career.
- 58% report they now achieve goals they set for themselves.
- 56% report they now set high goals so they have to work to achieve them.
- 33% report they now put their goal in writing.

319 youth were involved in programs focused on advanced skills in achieving goals. Completed questionnaires were obtained from 77 youth (24% of the total program participants). The following advanced outcome indicator data was obtained.

Because of their 4-H experiences,

- 79% report they now set deadlines to help them achieve their goals.
- 79% report they now try to get as much assistance as they can when working toward their goal.
- 78% report they now have a goal set for their job and career.
- 71% report when others set goals for them, they now try to work out the details.
- 65% report if they don't achieve their goals on the first try, they now keep trying.

57,389 Tennessee youth were involved in programs in which an outcome evaluation was conducted of their knowledge, attitudes and skills in communicating. Intact groups of 4-H youth were randomly selected for post-test only questionnaires from the Tennessee Life Skills Evaluation System (described above). The questionnaires used a five-part scale (I can do it, I need a lot of help, don't know, I need a little help and I can do it by myself) to obtain the following outcome indicator data at the beginning, intermediate and advanced levels. The following impacts represent "I need a little help" and "I can do it myself" answers.

43,049 youth were involved in programs focused on developing beginning skills and aspirations in communicating. Completed questionnaires were obtained from 8,274 youth (19% of the total program participants). The following beginning outcome indicator data was obtained.

Because of their 4-H experiences,

- 89% report they can now understand and follow directions.
- 84% report they can now select a topic for a speech or presentation.
- 83% report they can now explain an idea to others.
- 83% report they can now speak loudly enough to be heard when giving a speech or talk.
- 78% report they can now use technology to help themselves express ideas.
- 74% report they can now deal with their nervousness when giving a speech or talk.
- 73% report they can now express ideas with a display.
- 72% report they can now share their ideas through writing.
- 71% report they now feel comfortable sharing their thoughts and feelings in a speech or talk.
- 67% report they can now name at least five jobs in which communication skills are important.

14,188 youth were involved in programs focused on developing intermediate skills in communicating. Completed questionnaires were obtained from 2,298 youth (16% of the total program participants). The following intermediate outcome indicator data was obtained.

Because of their 4-H experiences,

- 92% report they can now keep records.
- 89% report they are now a better listener.
- 84% report they now know how to organize the parts of a speech or presentation.
- 83% report they are now able to give an informative speech or presentation.
- 82% report they are now able to five a 2-3 minute speech or presentation.
- 78% report they have now learned to use a camera better.
- 77% report they can now show enthusiasm when giving a speech or presentation.
- 75% report they now have the confidence to speak in front of groups.
- 74% report they are learning skills in visual communication.
- 67% report they have explored careers in communication.

152 youth were involved in programs focused on developing advanced skills in communicating. Completed questionnaires were obtained from 59 youth (39% of the total program participants). The following advanced outcome indicator data was obtained.

Because of their 4-H experiences,

- 93% report they are now able to get their point across.
- 90% report they are now able to express their opinions in speeches or presentations.
- 76% report they are now able to give an impromptu speech.

- 60% report they now ask questions to make sure they understand.
- 50% report it's now easier to express their opinions to someone with a different view than their own.

Funding: Smith-Lever

Scope: State-specific

Title: Discovering the World of Electricity and Other Basic Sciences

Issue: What happens when you flip on a light switch or turn on a TV? How is electricity generated, transmitted and distributed to your home? Why is electricity dangerous and how can we play it safe as we use it? How can you conserve energy? Tennessee youth find the answers to these questions and discover facts about electricity, energy, electronics and other basic sciences at the Tennessee 4-H Electric Camp.

What has been done: UT Extension conducts a four-day Electric Camp each year for middle school youth. Electric Camp utilizes hands-on activities, field trips educational presentations to improve these young 4-Her's knowledge of electricity, energy conservation, alternative energy sources, electronics, jobs and careers, computer applications and electrical safety.

Impact: Pre- and post-test were obtained from the 264 youth attending the 2006 Electric Camp. Impacts included:

- *Knowledge Gained*: Increasing electrical safety awareness and a better understand of proper household wiring techniques are key factors in reducing deaths, injuries and economic losses due to electrical hazards. At the start of the 2006 4-H Electric camp, only 30% of 264 4-H members attending knew that overhead power lines were not insulated and could cause severe shocks, and only 37% had a clear understanding of proper household wiring techniques. As a result of the camp, over 70% of these 4-Her's now have a better understanding of overhead power line safety and 73% a clearer understanding of proper household wiring techniques.

- *Skills Learned:* Conserving electricity has become increasingly important as energy rates and shortages have increased. Conserving electricity starts with knowing how much electricity common household appliances consume and how to read an electric meter. The percentage of campers that know how to read an electric meter increased from 4% before camp to 71% after the camp.

Funding: Smith-Lever b and c; Tennessee Electric Cooperative Association; Tennessee Municipal Electric Power Association; TVA; Other electrical industry donors.

Scope: State-specific

5.4 Key Theme: Education for Better Tennessee Parenting

Title: Incarcerated Parents Reaching Outside to Their Children

Issue: More than 12,600 children of inmates are under the age of 18 in Tennessee. With more than 19,000 people incarcerated in the state, that is, roughly 18,293 males and 1,138 females, it is essential that outreach education be provided to imprisoned parents. Such educational program will help parents to have a better understanding of the needs their children have and the need to teach their children values that are considered to be important in society.

What Has Been Done: Parenting classes have been conducted with Davidson County female inmates to help them to understand some of the challenges encountered in parenting, the importance of trying to serve as a role model, the need to care for self, building effective communication skills, guiding a child's behavior, and utilizing support systems. Six classes consisting of six weekly sessions were conducted with 54 female inmates. Child and adolescent development sessions were conducted with more than 150 male inmates. The sessions were designed to help incarcerated parents understand child development; highlighting the stages their children are in, age-appropriate behaviors during each stage, the importance of healthy parent-child relationships, and best parenting practices.

Impact: Evaluation results from the 204 inmates revealed that:

- 100% acquired a better understanding of differentiating between discipline and punishment.
- 100% planned to change their lifestyle behavior in order that their children not follow the course that they had chosen.
- 98% indicated that they will put forth stronger efforts to improve their communication skills in order to have a good parent-child relationship.
- 95% noted that the training had provided them with the insight to view their style of parenting differently than they previously had done prior to taking the training.
- 100% learned that the greatest gift that they can give to their children is to give of them.
- 95% learned the need to have security in social, physical, and financial aspects of their lives.
- 89% gained a better understanding that caring for and shaping a child's life is a big responsibility.

The following is anecdotal data from some of the male program participants at the Sheriff's Office:

- "I will spend more time with my kids and tell more men to spend more time with their kids."
- "I learned how to respect my children and give them more support."
- "Separated parents need to work together more for the children."
- "I now know that children can understand when something's wrong in the family."

- "I learned how to discipline them and how to show love and affection."
- "Even though I'm not in my child's life on a daily basis, I can still help raise her."
- "I learned to talk more to the children about their needs."
- "I learned how to talk to my baby's mother the right way."

Funding: NARETPA Section 1444 and 1445

Scope: State-specific

Title: Parenting Apart: Effective Co-Parenting in Tennessee

Issue: Based on the latest data available, Tennessee has the fifth highest divorce rate among reporting states (Division of Vital Statistics, NCHS, 2004). On average, children whose parents divorce have higher rates of emotional problems, academic problems, and engage in higher risk behaviors than do children who remain in two-parent biological families. In Tennessee, divorcing parents with minor children are required to complete a minimum of four hours of parent education about the impact of divorce on children with the goal of reducing the negative impact of divorce on children and reducing the amount of parental conflict to which children are exposed.

What has been done: UT Extension agents in 62 counties provided *Parenting Apart: Effective Co-Parenting* classes to more than 2,900 participants. The Extension Specialist conducted training for 11 new or reassigned agents to prepare them to teach the program. An online course entitled *Finances Through and Beyond Divorce* was developed jointly with the Family Economics specialist and piloted with 69 Extension Agents.

Impact: Evaluations were obtained from 2,797 participants in 2006. Impacts included:

- *Knowledge Gained:* 92% or more agreed or strongly agreed that they learned about the value of the parents cooperating for the sake of their child, the importance the child of a meaningful relationship with both parents, and increased their knowledge about the problems of divorce for children.

- *Attitudes Improved:* Participants reported a significant decrease in the level of resentment at having to attend the class (mean= 2.43 prior to the class and mean= 1.69 after the class, n= 2732, $p < 0.000$).

- *Skills Acquired and Aspirations Enhanced:* 92% agreed or strongly agreed that they learned communication skills they could use with their ex-spouse and children. 93% indicated that they agreed or strongly agreed that they planned to work with the other parent in the best interest of their children.

- *Behaviors Changed:* Participants in the follow-up evaluation (n=82) who completed the classes in 2005 indicated a significant decrease from before taking the class to 3 to 9

months after completing the class in the following behaviors: talking to others about the other parent when angry at the other parent, asking the child about the other parent, arguing in front of the child, complaining in front of the child, and yelling in front of the child. 67% of follow-up participants indicated they continued to use the printed materials they received in the class.

Funding: Smith-Lever; User fees

Scope: State-specific

Title: Grandparents Raising Grandchildren

Issue: There are approximately 61,252 grandparents raising 101,510 children under age 18 in the state of Tennessee. By one estimate, most grandparent-headed households are the result of drug or alcohol abuse involving the parents. Parental incarceration; mental or physical illness; family violence; poverty; death; and teenage motherhood all contribute to the problem. Due to the increased responsibilities that consume grandparents, they need to know what services and/or support systems are available to them and how they access those services.

What has been done: TSU Extension held meetings with more than 60 grandparents to alert them of opportunities designed to address their needs; and help them to identify resource services they can use to help them to care for their children more adequately. Additionally, several meetings were held with 107 individuals that represented religious groups, universities, state, local, and other agencies and organizations to plan for a conference to educate grandparents and other relatives raising underage children about what they need to do to receive help with overwhelming day-to-day responsibilities. A major conference was held whereby a total of 189 relative caregivers and professionals were in attendance.

Impact: The grandparents raising grandchildren group had:

- 100% that gained knowledge about the availability of community resources.
- 95% who planned to use available resources and services.
- 100% who planned to share this information with others to encourage them to join support groups.
- 30% who would consider applying to become foster parents to the grandchildren in their care.

The conference provided caregivers with information through presentations and information booths. The attendees gained new knowledge of services that would benefit them in caring for disabled children and other special needs children.

Funding: NARETPA Section 1444 and 1445

Scope: State-specific

Title: Tennessee Parent Education Programs

Issue: Based on data from Kids COUNT 2006, Tennessee ranks 46th among the 50 states in child well-being. In 2002, 8,494 Tennessee children were abused and 9,359 children were in foster care. More than half of those abused experienced physical neglect or medical neglect. Parent education is one method that is effective in improving parenting skills and reducing child abuse and neglect. Researchers have found that parents influence children in meaningful ways and that effective parenting behaviors can be taught and learned.

What has been done: Extension agents provided parent education via group meetings and demonstrations resulting in 2,793 contacts (this number includes court-ordered parents, teen parents, and step parents and does not include contacts with divorcing parents). They made an additional 10,008 direct contacts through methods such as office visits and on-site visits, direct mail, and phone calls. They reached a potential audience of 870,717 through indirect methods such as newspaper articles, radio programs, exhibits, promotional items, distribution of publications, and websites.

Impact: This program was evaluated by comparing participants' responses to a pre-test and a post-test.

Knowledge Gained: 290 of 324 parents/caregivers (90%) improved knowledge scores from pre-test to post-test on developmental stages of children.

Attitudes Improved: 227 of 320 participants surveyed (71%) reported feeling less stressed in their parenting roles.

Skills Acquired:

- 509 of 716 parents/caregivers (71%) were able to construct appropriate "I" messages when presented with scenarios.
- 395 of 448 parents/caregivers (88%) identified strategies they will implement to deal with stress of parenting.

Aspirations Enhanced:

- 663 of 716 parents/caregivers (92.6%) plan to decrease or avoid exposure or their children to parental conflicts.
- 325 of 334 parents/caregivers (97%) plan to increase their level of monitoring of their children's friends, whereabouts, and activities.
- 331 of 353 parents/caregivers (94%) plan to increase their use of encouragement with their children.
- 230 of 249 parents/caregivers (92%) plan to increase use of guidance strategies other than corporal punishment.

Behaviors Changed:

- 325 of 499 participants surveyed (65%) reported decreasing exposure of their children to parental conflicts.
- 223 of 301 participants surveyed (74%) reported increasing their level of monitoring of their children's friends, whereabouts, and activities.
- 263 of 313 participants surveyed (84%) reported their communications with their children improved.
- 95 of 216 participants surveyed (44%) reported they had decreased use of corporal punishment.

Funding: Smith-Lever

Scope: State-specific

5.5 Key Theme: Child Care

Title: First Steps – A Pre-Service Training for Newly Hired Childcare Educators

Issue: The state of Tennessee requires that all newly hired childcare teachers receive two hours of pre-service training during their first 30 days of employment. Thus, providers are often scrambling to find the appropriate training to fulfill this mandate. Increased training hours mandated by the state for child care professionals has increased attendance and space issues where child care teachers receive their training. More innovative training was needed to help with the problems of overflow and crowdedness at workshop venues.

What has been done: UT Extension developed a unique and cutting-edge video and compact disc self-study program based on the latest research for the new hires. The videos and compact discs were placed in every childcare center across the State. During 2006, over 10,000 childcare teachers participated in the program.

Impact: Pre- and post-test evaluations show participants had an average knowledge gain of 45% (n=8,000) in content areas of health, safety, guidance, and ages and stages of development. 90% or more agreed or strongly agreed they felt more confident when handling aggression issues between children, asked open-ended questions of children more often when interacting with children to help them "think", were more likely to facilitate developmentally appropriate activities and reported reading more to children (n=600). This information is based on a 6-month follow-up survey.

Funding: Smith-Lever; Tennessee Department of Human Services

Scope: State-specific

Title: Windows of Opportunity – Bright Beginnings for Young Children

Issue: Extensive research has shown that the first three years of a child's life is the most critical period for healthy brain development to occur. Research has also shown that children who experience consistent negative social interactions and environments during those first three years will be delayed in the area of social/emotional development and will not be "ready to learn" once they arrive at kindergarten. More recently, the early brain research pointed to two main areas of development educators should focus attention toward to provide infants and toddlers the best chance for later life success – social/emotional and language development.

What has been done: UT Extension used the latest in research content and application to develop a curriculum for childcare educators and parents focusing social/emotional and language development. 95 Extension Agents were trained and have since educated over 3,000 childcare professionals and parents.

Impact:
Knowledge Gained: Pre-and post-test surveys of 2,828 participants show that 80% of participants had a knowledge gain of at least 15% during the multi-session program.

Attitude: The mean score of participants (n = 2,828) believing it is beneficial to provide early literacy experiences and quality social/emotional experiences to children aged 0-3 increased by six points (before program = 2.2; after program = 8.2 with 10.0 being best).

Aptitude: 87% of the 2,828 participants report they plan to use suggested practices related to quality early social/emotional experiences and literacy experiences with their childcare program or at home.

Skills Enhanced (three month follow-up survey): Childcare professionals and parents report yelling less at children, saying at least three to five positive statements to children each day, using suggested guidance techniques, blaming or putting down children less, showing increased affection toward their children and singing, talking and playing more with children than before (n=1700). Also, childcare professionals and parents report reading to their children more than before, visiting the library more than before, exposing more print material in the child's setting than before, providing books for children at their eye-level and within their reach, asking open-ended questions while reading to children, providing a writing and drawing center and report labeling objects in the classroom more than before (n=1400).

Funding: Smith-Lever

Scope: State-specific

5.6 Key Theme: 4-H Civic Engagement

Title: Tennessee 4-H Builds Better Citizens

Issue: Active participation in the community through service learning, democratic participation, and global and heritage education are key to developing a relationship between active youth participation and productive adult citizens.

What has been done: In 64 Tennessee counties, UT and TSU Extension conducted 3,282 group meetings focused on responsible citizenship reaching 73,047 contacts. Extension agents also reached an additional 11,753 contacts through direct mail and telephone calls. The following county efforts were representative of the statewide effort:

> *Madison County* – Extension agents and advisory leaders added the Service Learning Chairman to the officer team for all 150 clubs to plan and encourage participation in the community. The county had 1,999 4-H'ers and 146 adults who gave 3,286 hours to different community causes. The County 4-H Honor Club also raised funds for impoverished Haitian families.
>
> *Hickman County* – UT Extension implemented the Character Counts! teens programs in which 15 eighth graders conduct character-building lessons with nearly 200 sixth grade students.
>
> *Cumberland County* – Extension agents made over 3,200 contacts with youth as they exposed 4-H members to the county's history, local government, and elected officials.

Impact: The Tennessee 4-H Life Skills Evaluation System was used to measure program outcomes in 32 counties. Participant questionnaires used a Likert-type scale with response categories from definitely false to definitely true to determine these results:

Because of their 4-H experiences

- 5,463 are now concerned about problems in their community.
- 2,982 now feel a sense of responsibility toward their school and community.
- 3,193 now have a sense of pride about their school and community.
- 509 report that they have encouraged an adult to vote in elections.
- 434 report that they have encouraged others to appreciate diversity.
- 869 report that they will register to vote when they are eligible.
- 3,707 report that they have learned about causes and issues.
- 3,648 report that they know about resources in their community.
- 5,164 would assist with or participate in elections, voting and campaigns.
- 11,868 youth believe that people working together can help others less fortunate.

- 4,125 youth report that they learned about important leaders who contributed to our nation.
- 16,176 youth think they can make a big difference in their community by helping others.
- 7,485 youth understand how community leaders are elected to office.

Funding: Smith-Lever

Scope: State-specific

Title: Developing Citizenship at Tennessee 4-H Camps

Issue: An important concept in responsible citizenship is the appreciation of diversity.

What has been done: A survey of life skill adoption was conducted during the 2006 Summer Junior 4-H Camp. Approximately 635 randomly-selected respondents were campers in the fourth, fifth, and sixth grade. They were asked to respond to 21 statements on a five-point Likert-type scale. The possible responses range from "Never" or "Definitely False" (assigned a score of 1) to "Always" or "Definitely True" (assigned a score of 5).

Impact: Of the 21 statements, nine have a mean score of 3.8 or higher.

Because of my 4-H experiences…

• I accept and appreciate that others may be different than me.	4.36
• I appreciate customs of people who are different than me.	4.15
• I think it's interesting to learn about other countries.	4.10
• I participate in activities that involve girls and boys.	4.00
• I act appropriately in most situations.	3.93
• If others are stressed, I try to help.	3.90
• I treat all people fairly.	3.90
• I am receptive to ideas and customs different than mine.	3.87
• I can start a conversation with someone I don't know.	3.80
• Next highest…	3.69

All statements have a mean score higher than the midpoint of 3, indicating at least some degree of agreement.

Funding: Smith-Lever; User fees

Scope: State-specific

5.7 Key Theme: 4-H Leadership and Volunteerism

Title: Tennessee 4-H Volunteer Development

Issue: Research indicates the importance of having a caring adult in a child's life in order to build resiliency and serve as a deterrent to high-risk behavior. The Tennessee 4-H Youth Development program relies on volunteers to deliver programs to youth. 4-H volunteers assist Extension personnel in building a sense of community for families and youth and in providing support and nurturing environments for positive youth development. The challenge becomes finding and training volunteers.

What has been done: Extension agents across the state of Tennessee involved 7,751 adult volunteers and 5,599 teen volunteers in delivering 4-H programs to youth. Volunteers were selected and trained to work with youth leading 4-H club meetings, teaching educational lessons, keeping records for project work and accomplishments and planning/implementing 4-H activities. During 2006, the following statewide outputs were reported:

- 743 new 4-H adult volunteers were recruited.
- 1,180 4-H adult volunteers utilized volunteer position descriptions.
- 249 4-H project groups were met by adult volunteers.
- 153 4-H judging teams were coached by adult volunteers.
- 828 4-H clubs were met by adult volunteers.
- 43,236 direct contacts with youth, parents, donors and others were made by 4-H adult volunteers.

In Bedford County, 65 volunteers responsible for in-school clubs indicated that the training helped them better prepare for their leadership role in club meetings. All of the volunteers received position descriptions when they started and indicated they had a better understanding of their responsibilities and were more confident in their role as a volunteer. In Cheatham County, over 35 volunteers have received training to work directly with youth.

Tennessee collaborated with the Southern Region states and Puerto Rico to host the Southern Region Leader Forum in Eatonton, Georgia, at the 4-H Rock Eagle Center for 675 4-H volunteers. At the forum, volunteers attended workshops, fun shops and listened to motivational speakers. The experiential learning activities required participants to discuss, use and apply their youth development knowledge. Participants returned to their states to begin sharing their newly acquired knowledge and skills and revived excitement with other volunteers to better serve youth and families in their communities.

Impact: Questionnaires and interviews conducted with volunteers showed that 2,208 volunteers increased their knowledge of positive youth development. The Independent Sector estimates the dollar value of volunteer time of $18.04 per hour for 2005. This value is based on the average hourly earnings of all production and non-supervisory workers on private non-farm payrolls (as

determined by the Bureau of Labor Statistics). Independent Sector takes this figure and increases it by 12% to estimate for fringe benefits. At $18.04 per hour, youth and adult 4-H volunteers in Tennessee contributed 13,185 hours valued at approximately $237,857 for positive youth development.

At the Southern Region Leaders Forum, 154 participants indicated these outcomes from their questionnaires:

- 59% responded they would go back to their county to teach or start a new program.
- 71% gained skills and knowledge to increase their effectiveness and competence as a 4-H volunteer.
- 59% said they developed a stronger commitment to the 4-H program.

Scope: Multistate (Regional)

Funding: Smith-Lever

5.8 Key Theme: Homeland Security and Emergency Preparedness

Title: Homeland Security and Emergency Preparedness

Issue: Since 9/11, Americans are more aware than ever that we, as a country, are vulnerable to terrorists' attacks. Also, in the last few years, major natural disasters have occurred in different parts of the country, and this experience has taught us most people are not prepared for an emergency, not even having the most basic supplies on hand. It's even more critical now that Tennessee's citizens be prepared for disasters and/or emergencies. UT Extension, as an organization, needs to be prepared and involved with each local emergency planning team as Extension has a critical role in the planning, response and recovery to disasters and community emergencies.

What has been done: Extension agents received training in disaster and emergency preparations. Direction and suggestions have been made at the state, county and local community levels for Extension's involvement in partnerships involved with emergency preparedness. Various efforts were used to teach directly (group meetings, phone calls, workplace visits, etc.) and indirectly (newspaper articles, exhibits, radio programs, etc.)

Impact: UT Extension's Disaster Preparedness for Families program reached 9,945 face-to-face contacts in 13 counties with significant knowledge gained on disaster preparedness issues. Of the 253 participants surveyed, 209 (83%) learned how to turn off the water, power and gas to their home and what to do in case of a called evacuation. The Disaster Preparedness for Finances program reached 2,933 contacts by Extension agents and another 1,029 contacts by volunteers trained by Extension Agents. Of the 638 participants surveyed:

- 91% learned what financial documents need to be available in case of an emergency.

- 87% learned how to properly store important financial documents.

Extension conducted Disaster Preparedness and Food Safety programs in 12 Tennessee counties reaching 3,195 direct contacts. Outcomes from questionnaires, observations and interviews showed that 87% of participants gained knowledge on how much and the types of food and water that are needed on hand. Prior to the program, none surveyed had any food or water stored.

Of the child care workers participating in the program, Extension surveyed 76 workers from 19 child care centers and schools. 100% indicated that the program taught them what to do in case of an emergency and that because of the program they had made adequate plans for emergencies.

Funding: Smith-Lever

Scope: State-specific

5.9 Key Theme: Home Environmental Quality and Safety

Title: Improving Environmental Quality and Safety for Children

Issue: Children need clean air to breathe, clean water to drink, safe food to eat and a healthy environment to learn, grow and thrive. Children are more vulnerable than adults because children's nervous, immune, digestive and other systems are still developing; children eat more food, drink more fluids and breathe more air in proportion to their body weight than adults; and children's behavior – such as crawling and placing objects in their mouths—may result in greater exposure to environmental contaminants.

What has been done: Programs directed toward specific hazards include but are not limited to; childhood lead poisoning, healthy homes and environmental tobacco smoke. Childhood lead poisoning prevention educational programs were conducted and facilitated by UT Extension. UT Extension is a major partner working with the Tennessee Department of Health to write the state's elimination plan, screening plan and plan of work to be in compliance with the requirement of the Centers for Disease Control. UT Extension, as a subcontractor with the Tennessee Department of Health also facilitated, coordinated and ensured compliance in state lead reporting; and designed generated, analyzed, interpreted and disseminated data for use in planning, implementation and evaluation of childhood and adult lead poisoning prevention efforts throughout the state.

Impact: UT Extension's Environmental Tobacco Smoke program had 2,239 direct and 15,639 indirect contacts. In four counties, of the 206 participants surveyed:

- 202 (98%) increased their knowledge of the health effects of environmental tobacco smoke on children.

- 173 (84%) increased their knowledge on how to minimize their child's exposure to environmental tobacco smoke.
- 93% do not now allow smoking in their home.
- 79% do not allow smoking in their vehicles.
- 65% do not allow others to smoke around their children.

Extension educators in four counties indicated 389 direct and 95 indirect contacts with 100% of all participants surveyed monitoring risk factors for Childhood Lead Poisoning. The state Extension lead educator reached over 10,000 parents and families with small children concerning the importance of accessing lead poisoning risk factors and communicating with their health care provider if necessary. In addition, over 1,000 painters and re-modelers were notified of EPA's 406(b) compliance ruling on notifying housing occupants of the possibility of lead in pre 1978 housing. They were also offered assistance in complying with the regulation. In 2006, due to Extension's surveillance system, 61,447 Tennessee children were screened for lead poisoning; 72,432 Tennessee residents (including children) were screened for lead poisoning; 466, including 208 children, were confirmed lead poisoned and referred to the state Department of Health; and there is now 95% electronic reporting by all laboratories.

Funding: Smith-Lever; Tennessee Department of Health; U.S. Centers for Disease Control; USDA; U.S. Department of Housing and Urban Development Healthy Homes

Scope: State-specific

IV. Stakeholder Input Process

UT Extension pursued five statewide data collections for needs assessment purposes during 2005:

1. An environmental scan was completed by 14 Extension professionals who considered trends, cycles, research and concerns affecting Tennessee.
2. All Extension personnel were surveyed, and asked to rate issues of importance to their county.
3. The issues were then summarized and submitted to the State Extension Advisory Council. Council membership is composed of UT and TSU representatives and stakeholders. A modified nominal group technique was used to identify priorities.
4. Next, 100 state leaders in business, government, agriculture, family and consumer sciences and youth development were surveyed as to which issues should be priorities for Extension from 2006-2011. The individuals surveyed included commissioners of state agencies, experts outside the land-grant university system, and leaders in business, industry and human services.
5. The UT Human Dimensions Lab was employed to conduct phone interviews with all 665 members of the state's 95 County Agricultural Committees. An additional group of 200 minority leaders, identified by County Extension Directors, were included in the phone interview so that the sample was representative of the state's ethnic and racial diversity.

In all of these data collection activities, stakeholders were asked which issues should be priorities and which issues should NOT be priorities. The data was analyzed showing four strategic directions for Extension's 2006-2011 Strategic Plan:

- Promoting safety, health and health care literacy
- Protecting our food, environmental and agricultural resources
- Promoting youth and workforce development
- Building and sustaining personal and family financial skills

Finally, state action agendas were written to address these strategic directions. Here is just one of multiple examples of how this stakeholder input was used to determine program directions:

> The 4-H Workforce Preparation program was conducted in 25% of Tennessee counties in FY 2005. The stakeholder input indicated that promoting youth and workforce development should be a priority for Extension over the next five years. In 2006, 4-H Workforce Preparation programs were expanded to 85% of Tennessee counties.

Stakeholder input for research conducted by the Tennessee Agricultural Experiment Station includes the following: Each research department has an advisory group, while most research and

education centers (the regional field laboratories) have advocacy groups. These groups meet once or more each year (typically at least twice). Current research activities and plans for future activities are reviewed at each meeting. Reactions and suggestions from the groups are received and factored into the research agenda setting process. Membership in each group is by invitation of the department head or center director, and typically consists of industry and regional representatives, local leaders, scientific peers, commodity group members, and other relevant stakeholders.

Input from Small-Scale, Limited-Resource Farmers: Master Meat Goat Producer

To identify production challenges, TSU Extension conducted county, regional and statewide meetings with goat producers. Surveys were completed at each meeting giving those goat producers an opportunity to note their major goat production challenges. The data was used to prepare a brief titled "Status of the Tennessee Goat Industry". The major outcome of the survey was establishment of the Master Meat Goat Producer Program. UT Extension conducted 77 group meetings for goat producers in goat health and management reaching 2,079 contacts. Farm visits, producer visits to the Extension Office, telephone calls, and direct mail to producers reached an additional 2,218 contacts.

Input from Small-Scale, Limited-Resource Farmers: Lewis County

UT Extension contacted 19 small-scale producers in Lewis County through on-farm visits and group meetings. Feedback from the group indicated that the producers would benefit from programming in value added agricultural production. The UT Extension Agent educated the group in cooperatives, marketing, and farm finances; and helped the producers to form the Agribusiness Development Alliance. The group meets monthly to promote agriculture, share resources, and develop the county's agritourism industry. In 2006, the group started a bi-weekly farmers' market that now provides 12 farmers an opportunity to locally market their produce.

Input from Rural Communities

Tennessee's rural areas lag micro- and metropolitan areas in regards to common indicators of economic prosperity. UT Extension conducted three one-day rural development roundtables, one in each of the state's grand divisions. They were held in mid-sized communities to be more accessible to rural residents; and 51 Tennesseans who live in rural areas participated. Almost a quarter of Tennessee's 95 counties were represented by at least one participant and 70% of these counties are designated non-MSA by the U.S. Census Bureau. Analysis of the roundtable discussions yielded three top priorities for strengthening rural Tennessee: (1) economic development, (2) education and workforce development, and (3) leadership and citizen participation. The insights and opinions shared provided important guidance for Extension and research programming.

Input from Local Extension Advisory Groups

UT and TSU Extension personnel conducted 110 meetings of various County Extension Advisory Groups; 79 meetings were composed of advisory leaders familiar with Extension

and 31 meetings were held in which the majority of advisory leaders were new to Extension. All meetings were organized to solicit input and decision-making into local Extension programs.

Input from Key Informants: Achieving Equity

UT and TSU Extension personnel conducted 145 interviews with key informants across the state to determine local needs and to receive input regarding the implementation of Extension programs. An example is Lawrence County where TSU Extension personnel interviewed the Supervisor of Instruction for the county school system and other local leaders. The interviews revealed that a key need among young people was greater civic engagement. In 2006, a 4-H citizenship program was organized for 1,000 youth. In Crockett County, a local bank official was interviewed by the UT Extension agent to determine needs related to family economics. The official shared that most citizens in the county did not know how to begin saving. This led to a "Money of the Bookshelf" exhibit at local schools' parents' night.

Various needs assessment activities conducted by UT and TSU Extension, such as listening sessions, invitation to stakeholder groups and advisory committee meetings, involved 20,233 Tennesseans. Consistent with the state's minority population, 20% of citizens involved in these needs assessments activities represented racial/ethnic minority groups.

Input from the State Extension Advisory Group

UT Extension and TSU Cooperative Extension Program continued their joint State Extension Advisory Council, a 24-member group representing a broad cross-section of the state. The Advisory Council continued to monitor progress on development of a new reporting solution for Extension called SUPER, System for University Planning, Evaluation and Reporting. Extension administrators worked with Advisory Council to determine Extension's performance in the four areas identified as priorities in the Extension Strategic Plan.

Input from the Tennessee Food Safety Task Force

During 2006, UT Extension made programming decisions based on feedback from this group, representing a cross-section of regulatory agencies, food service industries and academia. The group provided guidance for the second year of the UT Extension effort in "Implementing a Dynamic Interdisciplinary Food Safety Curriculum Targeted at Middle School Students" funded by USDA grant monies.

Input from County and Regional Tennessee Saves Coalitions

Needs assessment data collected in 2006 via focus groups, questionnaires and advisory council meetings has continued to show that a major concern of Tennesseans was the rising debt among the state's young consumers. UT Extension continued to implement the Changing Workplace program, an adaptation of the Tennessee Saves effort, but focused on young employees. UT Extension agents made site visits and held group meetings in over 70 corporations across the state.

V. Program Review Process

The program review process established in the FY 2000-2004 Plan of Work was utilized in FY 2006. All Extension programs initiated in the state of Tennessee, funded in whole or part from Smith-Lever or NARETPA Section 1444 and 14445 funds, require a merit review process. The criteria for a merit review were established in 2000, and in October of 2005, the Department of Extension Evaluation and Staff Development at the University of Tennessee managed a process to update and validate these criteria. The criteria were submitted to an out-of-state panel of seven Extension administrators, program leaders and scholars for their review. The states represented in the review panel were Arkansas, Kentucky, Mississippi and Texas. The review panel found the criteria to be fair, reliable, consistent with the current research-base, and overall a model for merit review of Extension plans of work. The criteria established includes: needs assessment; appropriate delivery methods; plans for evaluation (tools/methods); reaches diverse audience; and outcomes clearly defined. After the criteria were established, UT and TSU pursued a coordinated merit review process for all programs. The planned program proposals are initially prepared by state Extension specialists. The proposals require that a logic model be established that includes proposed inputs, outputs and outcomes. All program proposals are reviewed by department heads and program leaders (UT) and program coordinators (TSU).This input is considered by the State Action Agenda Review Team which consists of the three UT State Program Leaders, one UT specialist in program planning and evaluation, and one TSU Associate Administrator. This review team accepts the program as presented, rejects the program, or accepts the program pending changes.

All proposed research projects that are funded under the Hatch Act of 1887 Multistate Research Fund undergo a rigorous review process for merit and scientific soundness. The review process begins informally with discussions between the project leader and the department head; research center directors are frequently consulted at this stage. After the research proposal draft is completed, the department head reviews the proposal. If the department head believes the proposal has potential merit, s(he) either suggests modifications or appoints a panel of scientific peers with expertise in the area of the proposed research to review the proposal. The review panel consists of three to five scientists; these scientists are typically from within the researcher's department, but if the department head deems it appropriate, peers from other departments within the Experiment Station, or from other institutions, may also review the proposed research. The review panel evaluates the proposal to determine if it is editorially appropriate, to determine if the protocol outlined is of sufficient clarity and quality to ensure a sound scientific effort (that should lead to publishable data), and to make a recommendation to the department head about the priority the proposed research should receive relative to the requested resources and the departmental mission. Upon receiving a recommendation from the panel, the department returns the proposal to the author for responses to the reviewer's comments, and, if appropriate, for revision of the proposal. Multistate project reviews are coordinated on a regional basis, as it is possible for our scientist to "join" a multistate project as our official participant after the project is approved.

VI. Evaluation of the Success of Multistate and Joint Research and Extension Activities

Issues of Critical Importance

UT Extension and the Tennessee Agricultural Experiment Station cooperate with peer institutions to address a number of issues of critical importance on the state, regional, and national level. In this report, the scope of the impact has been identified for all programs. Examples of critical issues, found in this FY 2006 report, addressed by multistate, multi-institutional, multi-disciplinary and integrated Research and Extension include:

Multi-Disciplinary	***Multi-Institutional***
• Reducing Risks in Fruit and Vegetable Production through Disease Management (plant sciences and entomology and plant pathology) • Tennessee Emotional Eating Report (human development and nutrition)	• TEAM UP Tennessee (UT and seven other institutions) • Master Meat Goat Producer Program (UT and TSU)
Multistate	***Integrated Research and Extension***
• Feeder Cattle Marketing (KY and VA) • Soybean Yield Gains (Regional) • Tennessee Cotton and Soybean IPM Success (AR and MS)	• Improving Tennessee Dairy Production • Economic Impact of Variety Test Data to Crop Producers

Both UT and TSU administrators discuss the best fit for addressing critical issues. Some issues are of multistate concern while others require a state-specific approach.

Needs of Under-served and Under-represented

The TEAM UP Tennessee program targets women in 11 Appalachian counties in Tennessee for breast and cervical screening. This program is coordinated with seven states to remove the multiple barriers that under-served and under-represented women face. These barriers include low socioeconomic status and shortages of medical services in their rural communities. The program has shown success at involving under-represented and under-served population. Over 1,700 women participated in 2006 and 89% of those reported they were no longer afraid to get screened for breast cancer and 74% reported they were no longer afraid to get screened for cervical cancer.

Expected Outcomes and Impacts

Outcomes were defined for all statewide programs, multistate programs, and integrated programs conducted by the University of Tennessee and Tennessee State University. Specialists and agents utilized the logic model concept so that resources are allocated to areas of greatest need, and logical steps are followed to reach the programs' stated outcomes. Extension personnel also consider any benchmark data that is available and set targets. Outcomes are

measured and compared to targets. The multistate and integrated programs conducted in FY 2006 by UT Extension and the Tennessee Agricultural Experiment Station achieved or exceeded their expect impact.

Toward Greater Effectiveness and Efficiency

In evaluating the success of these and other activities, UT and TSU Extension and the Tennessee Agricultural Experiment Station find that efforts to offer multi-disciplinary, multi-institutional, integrated and multistate programs have been exemplary in FY 2006. Major indicators of effective and efficient programs include:

- All departments in the UT Institute of Agriculture have faculty with joint appointments in Extension and Research.
- All departments in the UT Institute of Agriculture have active multistate Extension programs and active Integrated Research and Extension programs.
- The multistate and integrated targets for Smith-Lever funds were exceeded.
- The integrated target for Hatch funds was exceeded.
- Multidisciplinary programs were common, such as Children's Environmental Health, Tennessee Shapes Up, Small Scale and Limited Resource Farmers, etc.
- Multistate programs included cooperation with Extension personnel in all southern states, and Wisconsin, Illinois, Missouri, and Kansas, in addition to programs with a national scope.

UT Extension personnel report their effort against their integrated and/or multistate assignment. This data is periodically checked to ensure that the goals of multistate and integrated programs are being achieved. Department heads may discuss multistate and integrated assignments during annual performance reviews.

VII. Multistate Research and Extension Activities

In FY 2006, the Tennessee Agricultural Research and Extension System met or exceeded the targets established for both Hatch and Smith-Lever funds under the AREERA of 1998. Examples of multistate activities included:

Fruit and Vegetable Profitability (Regional)
To address the educational needs of existing and potential growers, UT Extension personnel cooperated with Extension fruit and vegetable specialists in all border states to conduct the 2006 Organic Fruit and Vegetable Systems In-Service Training. In this project, 51 Extension agents and specialists from seven states learned by performing many of the tasks associated with risk management in commercial and organic vegetable and fruit production and marketing. Presenters included UT and TSU personnel, independent growers, and organic production specialists from surrounding states.

Feeder Cattle Marketing (KY and VA)
When feeder cattle are properly pre-conditioned and sold cooperatively in large groups, prices are higher and net returns are greater for beef producers. In 2006, Extension personnel in Tennessee, Virginia and Kentucky assisted beef producers from 16 counties to market 75 loads of pre-conditioned cattle, earning beef producers $30 per head more for each head of cattle.

Soybean Yield Gains (Regional)
Tennessee Agricultural Experiment Station researchers collaborate with researchers from all Southern Region states in conducting and using soybean research. The impact of soybean breeding research in the Southern Region is estimated at $374,000 for Tennessee producers.

Fire Ants eXtension (National)
Tennessee has seven Extension personnel who participate in the Imported Fire Ant Community of Practice for the eXtension initiative.

Tennessee Cotton and Soybean IPM Success (AR and MS)
This multistate research project involves Tennessee, Arkansas and Mississippi researchers to evaluate plant bug and stink sampling procedures and thresholds.

TEAM UP Tennessee (AL, GA, IL, KY, MS, MO and SC)
The TEAM UP Tennessee program targets women in 11 Appalachian counties in Tennessee for breast and cervical screening. This program is coordinated with Extension personnel in seven states. The exemplary program outcomes have been well-documented in this report.

VIII. Integrated Research and Extension Programs

The Integrated Research and Extension programs conducted by UT Experiment Station and UT Extension were in compliance with the AREERA of 1998. An overview of 2006 integrated programs includes:

Managing Fescue Toxicosis
Assisting Tennessee beef producers to implement management practices discovered through Tennessee Agricultural Experiment Station research is estimated to save the Tennessee cattle industry $40-50 million annually.

Improving Tennessee Dairy Production
Joint UT Extension and Experiment Station efforts through on-farm research projects in dairy grazing have helped four Tennessee dairy farms to convert to certified organic production.

Row Crop Disease Control Program
Hatch and Smith-Lever funds are used to conduct this program which addresses research and education needs of cotton and soybean production. The research targets nematode control measures. The research was shared in 20 meetings contacted over 600 soybean producers.

Irrigation for Humid Regions
Faculty with joint Extension and Research appointments conduct irrigation surveys, on-farm demonstrations and research trials, and producer meetings to reduce non-point pollution, among other outcomes. Because of this program, improved irrigation scheduling methods were adopted by producers who farm over 40,000 acres of row crops in West Tennessee. This integrated program also supported the establishment of one locally owned irrigation business in 2006.

Forest Products Industry
The UT Forest Products Center, funded by multiple sources including Hatch and Smith-Lever, is a major resource for the Tennessee forest products industry, housing a number of leaders in wood science research and a wealth of cutting-edge analytical and testing equipment. In 2006, UT expanded its applied forest products research program, involving representatives from the wood products industry in the state, other companies in the Southeast and federal government agencies. Seven competitive grant proposals were submitted to a broad range of funding agencies, and two research programs ($95,149) were initiated in 2006. Both projects will provide research on new product development and improved evaluation of product performance.

Economic Impact of Variety Test
UT Extension and Tennessee Agricultural Experiment Station conduct on-farm research and demonstrations of different varieties (hybrids) of corn, soybeans, wheat and cotton. The total combined impact of the Variety Test data is estimated at $95.5 million.

IX. Contact Information

Inquiries regarding this report should be directed to any of the following:

Dr. Joseph A. DiPietro, Vice President for Agriculture
The University of Tennessee
2621 Morgan Circle
101 Morgan Hall
Knoxville, TN 37996-4505
phone: 865-974-7342
facsimile: 865-974-8781
email: dipietro@tennessee.edu

Dr. H. Charles Goan, Interim Dean
The University of Tennessee Extension
2621 Morgan Circle
121 Morgan Hall
Knoxville, TN 37996-4530
phone: 865-974-7245
facsimile: 865-974-1068
email: cgoan@tennessee.edu

Dr. Thomas H. Klindt, Interim Dean
The University of Tennessee Agricultural Experiment Station
2621 Morgan Circle
126 Morgan Hall
Knoxville, TN 37996-4500
phone: 865-974-7303
facsimile: 865-974-9329
email: tklindt@tennessee.edu

Dr. Clyde E. Chesney, Administrator
Tennessee State University Cooperative Extension Program
3500 John A. Merritt Boulevard
Nashville, TN 37209-1561
phone: 615-963-1351
facsimile: 615-963-5833
email: cchesney@tnstate.edu

X. Attachments Required by AREERA Section 105

Appendix A: Integrated Activities with Hatch Funds

U.S. Department of Agriculture
Cooperative State Research, Education, and Extension Service
Supplement to the Annual Report of Accomplishments and Results
Actual Expenditures of Federal Funding for Multistate Extension and Integrated Activities

Fiscal Year: 2006

Select One: ☐ **Interim** X **Final**
Institution: Tennessee Agricultural Experiment Station
State: Tennessee

	Integrated Activities (Hatch)		Multistate Extension Activities (Smith-Lever)		Integrated Activities (Smith-Lever)
Established Target %	25%	%		%	
This FY Allocation (from 1088)	$4,468,275				
This FY Target Amount	$1,117,069				
Title of Planned Program Activity					
Competitiveness of Production Systems	$1,010,968				
Promote Sustainable Management	$105,477				
Preserve & Enhance Water Supplies	$7,116				
Control Risks	$36,478				
Total	$1,160,039				
Carryover					

Certification: I certify to the best of my knowledge and belief that this report is correct and complete and that all outlays represented here accurately reflect allowable expenditures of Federal funds only in satisfying AREERA requirements.

March 15, 2007

Appendix B: Multistate Extension Activities and Integrated Extension Activities with Smith-Lever Funds

U.S. Department of Agriculture
Cooperative State Research, Education, and Extension Service
Supplement to the Annual Report of Accomplishments and Results
Actual Expenditures of Federal Funding for Multistate Extension and Integrated Activities

Fiscal Year: 2006

Select One: ☐ **Interim** X **Final**
Institution: University of Tennessee Extension
State: Tennessee

	Integrated Activities (Hatch)	Multistate Extension Activities (Smith-Lever)	Integrated Activities (Smith-Lever)
Established Target %		10%	15%
This FY Allocation (from 1088)		$7,681,103	$7,681,103
This FY Target Amount		$768,110	$1,152,165
Title of Planned Program Activity			
Goal 1 – Ag Competitiveness		$382,172	$1,299,390
Goal 2 – Food Safety		$14,699	$49,977
Goal 3 – Nutrition and Health		$352,774	$1,199,437
Goal 4 – Environment		$29,397	$99,953
Goal 5 – Quality of Life		$690,847	$2,348,897
Total		$1,469,889	$4,997,654
Carryover			

Certification: I certify to the best of my knowledge and belief that this report is correct and complete and that all outlays represented here accurately reflect allowable expenditures of Federal funds only in satisfying AREERA requirements.

H. Charles Gosnell

March 15, 2007

Appendix C: Multistate and Integrated Summary

The following table provides an overview of Tennessee's FY 2006 Multistate and Integrated Research and Extension impacts found in the planned programs section of this report.

Multistate Examples	*Integrated Examples*
● Feeder Cattle Marketing – p. 13 ● Risk Management for Fruit and Vegetable Producers – p. 22 ● TEAM UP Tennessee – p. 45 ● Fire Ants – p. 49 ● Tennessee Cotton and Soybean IPM Success – p. 51 ● Tennessee 4-H Volunteer Development – p. 79	● Managing Fescue Toxicosis – p. 10 ● Improving Tennessee Dairy Production – p. 15 ● Economic Impact of Variety Test Data to Tennessee Crop Producers in 2006 – p. 17 ● Row Crop Disease Program – p. 18 ● Irrigation for Humid Regions Maximizes Economic Return and Minimizes Non-Point Pollution – p. 20 ● Turfgrass Management Strategies – p. 23

A number of multistate and integrated projects were conducted which are not represented in the planned programs section of this report, and a sample of these programs are described below:

Continuing Education for Forestry Professionals (KY)
Foresters and resource professionals need updates on changing technologies to provide private landowners with the latest management practices. UT Etension forestry specialists collaborated with University of Kentucky specialists to six publications on hardwood silviculture. These publications are for a professional audience and are supported by Smith-Lever and the Southern Regional Extension Forestry working group. Each of the publications are used in continuing education programs for professional foresters

Family Economics: Money Crunch (KY, KS and FL)
To target young employees at the worksite, this multi-state program builds on the success on the Tennessee Saves program and the Changing Workplace program. Curriculum and support materials are being prepared to reach young employees who need education to make decisions regarding complex retirement packages and health care cost issues.

National 4-H Congress (National)
Tennessee Extension 4-H personnel worked cooperatively with Extension personnel from across the nation to implement the 2006 National 4-H Congress in Atlanta. Tennessee continued its long tradition of providing service to a number of the operating committees for this national event.

Program and Staff Development Committee (Regional)
All personnel in the UT Department of Extension Evaluation and Staff Development serve on the Southern Region Program and Staff Development Committee with peers from all states in the region, including 1890 representatives. In 2006, UT contributions including: serving the committee as secretary; coordinating a video conference with staff from Oklahoma and Wisconsin to discuss improving Southern Region Plan of Work submissions; and creating a "History of Extension" module for the Cooperative Extension Curriculum Project.

Tennessee Shapes Up Economic Impact (Regional)
UT Extension's health specialist, evaluation specialist and nutrition specialist serve on a Southern Region Economic Impacts Working Group for Obesity Prevention Programs. The group has proposed a Region-wide protocol for measuring the impact of Extension programs that teach physical activity and nutrition.

Southern Region Master Gardener Conference (Regional)
UT Extension personnel cooperated with Extension specialists in all Southern region states to offer the 2006 Regional Master Gardener Conference and Expo. The event provided opportunities for over 200 Master Gardeners to extend their knowledge and skills. Tennessee personnel have served as advisors to Oklahoma Extension personnel in hosting a future conference.

Gardening by the Drop: Healthy Landscapes on the Rural-Urban Fringe (AL, SC and TX)
In 2006, UT Extension collaborated with Extension personnel from Auburn University, Clemson University and Texas A&M to provide this water conservation short-course in the Knoxville area. The goal of the workshop was to examine water protection, management and conservation issues as communities become more urbanized and land use changes. Over 35 local public leaders, landscape professionals, and Master Gardeners attended. Evaluation showed that local leaders and landscape professionals prefer water conservation information on compact discs.

Tennessee Pest Management Information Network (FL and NC)
The Southern Region Integrated Pest Management Center (SRIPMC) assists various agencies in research. UT Extension has worked cooperatively with personnel at the two SRIPMC, in both Florida and North Carolina. UT Extension personnel work on regional teams to create crop profiles and pest management strategic plans, as well as reviewing technical documents.

Integrated Pest Management (Regional)
UT Extension and Experiment Station personnel worked with the University of Kentucky's IPM programs by being a point of contact and information source. UT's State Contact Project continues to gather and disseminate pest management information. UT Extension pest management specialists consult with EPA, 1890 university IPM program representatives, state departments of agriculture and environmental conservation, Extension personnel and commodity groups to ensure that timely pest management information is available in all persons in all Southern Region states.