TENNESSEE AGRICULTURAL RESEARCH AND EXTENSION SYSTEM

REPORT OF ACCOMPLISHMENTS AND RESULTS FY 2005

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

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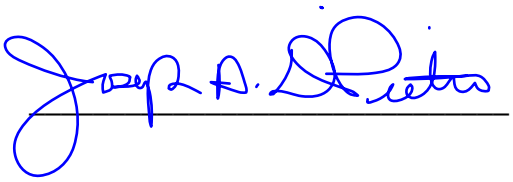
I. Introduction

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 5.2 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 and the Tennessee State University Institute for Agricultural and Environmental Research comprise the 1890 institution. This FY 2005 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. This report includes results and accomplishments of FY 2005 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 2005 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.



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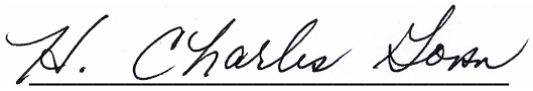

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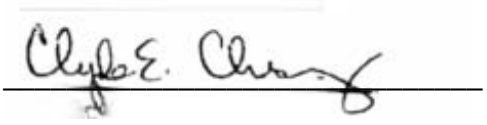

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III. Planned Programs

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 2005 Extension and Research planned programs have been organized by the five USDA-CSREES National Goals. A brief overview of outcomes in each National Goal includes 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

In FY 2005, educational contacts for Goal One projects and activities numbered 500,754. Research and Extension priorities continued to include beef cattle management and marketing, forages, crop research and production, alternative and sustainable enterprises, fruit and vegetable production, horticulture and outreach to the state's limited resource and small farmers. Because the core of Tennessee's farm economy is small farms, UT and TSU Extension taught alternative management and marketing practices that showed increased net income, improved production, and improved marketing strategies. Research and Extension efforts in areas such as forages, goat management, fruit and vegetable production and beef cattle were pursued to increase profitability of Tennessee's small farms.

1b. Highlights

UT and TSU Extension conducted forage education programs in 73 Tennessee counties, and made 15,790 educational contacts for forage crop production and testing. Contacts were made with landowners, producers and professionals through field days, group meetings, newspaper articles, radio programs and farm visits. Forage and soil testing for production and profitability were emphasized. In 2005, over 150 producers completed the UT Extension bermudagrass hay production schools.

UT's Forage-Mineral Survey involved collecting and analyzing 1,021 tall fescue samples from farms in 72 counties. Results were shared at 24 field days or cattlemen's meetings in 2005. All companies who manufacture and/or sell minerals in Tennessee have made substantial adjustments in products or product lines sold in Tennessee based results of this study.

Research and demonstration plots were established to improve irrigation practices in most of Tennessee's major crop enterprises: tobacco, forage, vegetable, nursery, and row crops. Research was pursued at UT Research and Education Centers as well on-farm demonstrations with Research and Extension personnel work collaboratively; and 487 producers and professionals were trained in irrigation design, installation, and management using the research and demonstration plots. UT Agricultural Research collaborated with a local entrepreneurial firm in developing a new tool for greatly increasing the ease and speed of plant root evaluation. This has application for soybean breeding, woody plant and commercial tree production, and perhaps most importantly in the areas of plant yield improvement to help transition from fossil fuels, and in breeding native plants having improved carbon sequestration capabilities. Based on recent findings, UT Agricultural Research hopes to develop practical solutions to ameliorate heat-induced infertility, thereby increasing economic livelihood of dairy and other livestock

producers. Switchgrass, cereals, and forage grasses are monocots, and genetic improvement using biotechnology is more difficult in monocots than in broadleaf crops. Despite these difficulties, UT Agricultural Research is developing biotechnology coupled with traditional genetics and breeding that can be used for genetic improvement.

1c. Benefits

Questionnaires from the bermudagrass hay production schools indicated that over 90% of the participants felt better able to produce bermudagrass after attending this program, and 100% indicated that they were changing to the recommended practices taught in this program.

Through the optimal irrigation research and demonstration program, improved irrigation scheduling methods were implemented by 50 West Tennessee producers who farm over 30,000 acres of row crops. UT Agricultural Research has produced components of a detection system utilizing transgenic plants to detect plant diseases in the field prior to symptoms. This could help farmers someday know about plant diseases much earlier than they do today for early intervention.

In Tennessee, the value of the Forage-Mineral Survey is estimated at $7 million. A questionnaire was conducted in 14 county beef meetings. This survey indicated that 78% of beef producers recognized that their herd's symptoms were substantial enough that they would be changing their mineral program. Total impact from all meetings and demonstrations is over $1.5 million.

1d. Assessment of Accomplishments

In Goal One programs, the 2005 success of multistate, multi-institutional, multi-disciplinary and integrated Research and Extension programs were numerous and noteworthy. Observations, questionnaires, production data, and on-farm interviews were used to evaluate programs. Findings indicated that Tennesseans increased production in numerous areas, applied value-added practices, and adopted more profitable management and marketing practices.

1e. Allocations for Goal 1

UT 1862 Research – $17,975,394 • Hatch – $2,607,622 • Multistate 3(c) 3 – $529,412 • McIntire-Stennis – $52,219 • State – $14,786,141	**FTEs for Goal 1 – 370.9** • UT 1862 Research – 288.0 (50.4 scientist and 237.6 non-scientist) • UT 1862 Extension – 74.0 • TSU 1890 Extension – 8.9 (7.0 professional and 1.9 para-professional)
UT 1862 Extension – $6,101,648 • Smith-Lever b and c – $1,194,321 • State/County – $4,907,327	**TSU 1890 Extension – $419,740** • NARETPA Section 1444 and 1445 – $286,943 • Grants and Contracts – $110,106 • State/County – $22,691

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

Title: Tennessee Agritourism Initiative

Issue: Agricultural producers face many challenges to achieve or maintain profitability. Although Tennessee farmers generated over $2.5 billion in farm sales in 2004, only 19 cents of each consumer dollar spent on food in the U.S., on average, is returned to the farm. The 85,000 Tennessee farmers averaged a net farm income of approximately $5,400 last year. Due to low net farm income and structural changes in agriculture such as the tobacco buyout, farmers are looking for ways in which to add value to their farm resource and for some, agritourism is a viable alternative. Tennessee Agritourism Initiative activities in 2005 were designed to assist producers in increasing net farm income.

What has been done: Activities included 22 educational programs for farmers and professionals. These programs provided approximately 5,000 participant hours of instruction to 1,131 individuals. Activities also included the development of three extensive resource publications and individual assistance for agritourism entrepreneurs.

Impact: Web site development and marketing workshops involved 27 participants. Participants in these and previous workshops have reported experiencing average financial savings or gain of $455 in the first three to six months following the workshop by saving class fees, not having to hire Web developers, being able to better communicate with Web developers, earning more sales revenue and other methods. Based on these results, participants have been estimated to receive over $12,000 in financial benefit within the first three to six months following the program.

A three-day educational conference was held for 284 participants from 11 states. Through a post-conference survey, 76 participants indicated they would take away between one and 300 ideas from the conference for a total of 1,309 ideas, an average of 17 ideas per respondent.

- 33 participants indicated the ideas would bring them up to $50,000 in monetary value within one year.
- The sum of estimates from the 33 participants for monetary value they expect to realize within one year totaled $330,900, with an average of just over $10,000 per respondent.
- Within five years, respondents expected to realize monetary value between $2,500 and $500,000 for a total value of almost $2 million.
- On average, conference participants expected to earn more than $60,000 within five years from ideas learned.

In-depth, individual assistance with the development of a marketing plan and improvement in marketing materials provided to one Tennessee agritourism entrepreneur resulted in approximately triple the number of participants in school tours and weekend activities for the

enterprise in 2005 compared to 2004. The assistance resulted in generating approximately $32,500 in additional gross admission revenue for the enterprise as well as an unreported amount of additional revenue from product sales.

Funding: Smith-Lever; USDA Rural Development; Tennessee Department of Agriculture; Tennessee Department of Tourism; Tennessee Farm Bureau Federation

Scope of Impact: Multistate (Southern Region)

Title: Tennessee's Value-Added Agriculture Initiative

Issue: Prices in commodity markets continue to fluctuate sporadically while production and operating costs continue to increase. Opportunities for income improvement often exist through value-added agriculture enterprises and activities. Tennessee's agriculture industry can also benefit from value-added income opportunities not directly related to production agriculture, such as tourism, natural resource utilization and waste/by-product utilization.

What has been done: Educational programs and services in value-added agriculture provided by the Center for Profitable Agriculture included 29 on-farm visits; six project analyses; 296 other farmer consultations provided via e-mail, telephone, direct mail and personal visits; 17 news releases; and five video/radio program interviews. Instruction was provided at 75 different events in 29 counties and one other state to 2,934 contacts. Educational information was disseminated from the Center's educational and informational exhibit at nine different trade show events. Educational information was distributed for individual inquiries through the development and dissemination of 77 information packets.

Impact: Programs developed and administered by teams and individuals in the Center resulted in definite impacts at the farm level. One of the most significant impacts is the long-term value of the increase in knowledge and skills obtained by the more than 2,900 participants in outreach teaching by Center Specialists. In addition, approximately 11 Tennessee farmers and 6 farmer groups were directly impacted in 2005 by one-on-one, project-specific evaluations and analyses.

Funding: Smith-Lever; Tennessee Farm Bureau Federation; Kentucky Center for Cooperative Development; Tennessee Farm Bureau's Value-Added Producer Grant; USDA Rural Development RBEG Grant; and Tennessee Department of Agriculture

Scope of Impact: Multistate (Kentucky)

Title: Unicoi County Apple Marketing

Issue: Apple orchards have been a major source of agricultural income for Unicoi County farmers for over 50 years. Recent social and cultural trends have reduced the number of people visiting local orchards to purchase apples. Apple growers prefer to sell most of their apples at

the farm to maximize their profits. Apple growers realize that they need to improve their marketing of on-farm apple sales in order to increase local demand for their apples.

What has been done: UT Extension formed a team consisting of seven apple orchard owners and the Unicoi County Chamber of Commerce with the goal of increasing the number of visitors to local orchards and thereby increasing on-farm apple sales. The group developed a brochure titled "Apple Orchards of Unicoi County." The brochure features descriptions of seven commercial orchards including interesting facts and historical information, varieties available, typical months when apples are available for sale, contact information, and any other agricultural products sold at the orchard. The brochure also includes driving directions to all of the orchards. The brochure has been placed on the Unicoi County Chamber of Commerce website to improve marketing to tourists visiting the area.

Impact: Apple growers have commented that this is the best marketing tool they have ever had, resulting in an estimated economic impact of over $10,000 in 2005. Unicoi County Chamber of Commerce reports that the brochure has secured increased interest in local apple orchards.

Funding: Smith-Lever; Unicoi County Chamber of Commerce

Scope of Impact: State-specific

Title: Building Financial Management Skills for Agricultural Producers

Issue: Farm businesses must have and use records for decision making purposes. Records are an important part of management and marketing.

What has been done: UT Extension used one-on-one consultations to create long-range farm plans (intensive plans) for 103 farm families. Additionally, 308 producers were assisted with partial farm plans, leasing or budgeting; 162 were assisted with marketing decisions; and 54 were assisted with farm policy or risk management problems.

Impact: A previous survey of farm families using intensive planning indicated an average of $11,000 per farm in increased income and/or reduced expenses resulting from intensive farm planning. This amount, applied to the 103 Tennessee farm families who completed intensive farm plans, totals over $1.1 million in increased income.

A questionnaire was completed with eight nursery producers who participated in two Quickbooks workshops held in Grundy and Warren Counties. The questionnaire showed:

- Record keeping and financial management skills increased 142%.
- Knowledge of how to use the software in your business increased 143%.
- Producers' overall knowledge of the software package increased 183%.

Accomplishments included:

- One producer has increased his equity in his farm business by $70,000 over the last three years.
- Another producer increased his equity in his farm business in 2004 by $91,499. This growth in equity is a result of a net farm income of $141,000.
- Net farm income increased by over $40,000 for one producer who has participated in Extension farm management programs the last three years.

Funding: Smith-Lever

Scope of Impact: State-specific

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

Title: Making Tennessee Forages More Productive and Profitable

Issue: More productive and efficient Tennessee forage production will contribute significantly to greater farm profitability.

What has been done: UT Extension conducted forage education programs in 73 Tennessee counties, and made 15,790 educational contacts for forage crop production and testing. Contacts were made with landowners, producers and professionals through field days, group meetings, newspaper articles, radio programs and farm visits. Forage and soil testing for production and profitability were emphasized.

Impact: In Wayne County, 99 soil samples were submitted for forage production. For the viable period of three years (two years for hay) and the 1,715 acres sampled, producers are likely to experience an impact of $101,364 to their forage profitability due to establishment of better stands, better per-acre yields, and reduced wastage of soil amendments. One producer was planning to apply two tons of lime per acre to his 140 acres of forages. The soil lab did not recommend that any lime be applied, so the producer will save $5,600 on the lime. Examples of comments received during interviews with Wayne County producers included:

- "I have more grass than I have ever had, with less money. I saved 53 pounds of fertilizer per acre [on his 250 acres, a $2087 savings]."

- "Soil testing has resulted in my hay production almost tripling."

- "Forage testing is the best money we have ever spent. We used to think we knew how to feed. Now, we KNOW we are feeding right."

In Lewis County, questionnaires were used to evaluate the program with 21 producers. Results showed that:

- 43% indicated that they planned on using recommended weed control methods.
- 100% indicated that they planned to utilize Extension forage recommendations.

In McMinn County, 34 producers learned about utilizing forage production systems to manage hay and pastureland, resulting in 15 producers either renovating or establishing forages in 2005. Through meetings and farm visits, 18 producers learned and utilized weed control recommendations for pasture and hay fields. By utilizing pasture renovation with legumes, weed control, hay production recommendations, planting small grain pasture, or establishing bermudagrass stands, 12 beef producers owning over 500 cows have reported increased calf weaning weights and/or decreased commercial feed and hay feeding costs, along with increases in hay and forage quantity and quality.

Observations and questionnaires from Decatur County indicate that 70 new hay pads were built to store and feed hay in the winter reducing hay losses of $600 per farmer per year.

A survey of 58 Smith County forage field day participants indicated that 95% learned to identify toxic plants in their forage crops, and most indicated they would take steps to eradicate the problem.

In Carter County, three producers improved their hay storage techniques. The storage areas should hold 300 bales weighing approximately 750 pounds. The estimate savings from less spoilage is 30%, and at a cost of $15 per bale, the dollar savings from better storage is $1,300 per year.

In East Tennessee, a Beef and Forage Field Day involved 212 current and potential beef cattle producers, and 44% attended the event for the first-time. An end-of-program questionnaire revealed that over 90% of participants gained knowledge in toxic plants.

Funding: Smith-Lever

Scope of Impact: State-specific

Title: Bermudagrass Hay Production Schools

Issue: Tennessee's horse hay market has grown dramatically. Many producers have decided to produce hay for this market. Bermudagrass has become one of the primary species of forage grown for horse hay. Several agronomic characteristics of bermudagrass result in different management requirements compared to tall fescue. As more and more acres of bermudagrass were being planted across the state, a few simple but common problems were showing up statewide. The problems were caused by the lack of experience in bermudagrass production by Tennessee producers.

What has been done: UT Extension initiated an educational campaign to teach producers in an intensive program the proper techniques to establish and maintain bermudagrass. In 2005, over 150 producers have completed our bermudagrass hay production schools.

Impacts: Evaluations returned via mail indicated that over 90% of the participants felt better able to produce bermudagrass after attending this educational opportunity; and 100% indicated that they were going to change some portion of their bermudagrass production program based on the topics taught in the school.

Funding: Smith-Lever; Tennessee Forage and Grassland Council, Vauhgn's No. 1 bermudagrass; Dow Agrosiciences; Pennington Seed Company

Scope of Impact: State-specific

Title: Feeding is Fundamental

Issue: In recent years, UT Extension Agents and Specialists have had numerous reports from beef cattle producers of cattle problems related mineral nutrition. These problems have sometimes been related to grass tetany, due to magnesium deficiency (and possible excess potassium), but are also related to deficiencies and imbalances of copper, sulfur, zinc and possibly selenium and other minerals.

What has been done: UT Extension Agents provided education and collected forage samples for analysis. A total of 1,021 tall fescue samples were collected for over 70 counties. These results, and detailed recommendations, have been widely disseminated. All companies who manufacture and/or sell minerals in Tennessee have been provided with this data. Possibly the greatest impact of this work is due to mineral manufacturers making substantial adjustments in products or product lines that are sold in Tennessee. Articles have been printed in Progressive Farmer, Drovers Journal, Tennessee Beef Cooperator, Farm Bureau News, Southeast Farmer and other publications. The articles in Angus Association publications have reached the greatest audience. The Angus Journal circulates to 17,500 people and the Angus Beef Bulletin circulates to 108,000 people. Results have been presented in at least 86 county meetings and in 2005, at 24 field days or cattlemen's meetings.

Impact: In Tennessee, the value of the program is estimated at $7 million. A survey was conducted in 14 county beef meetings. This survey indicated that 78% of beef producers recognized that their herd's symptoms were substantial enough that they would be changing their mineral program. They estimated that production losses averaged $910 per farm. The impact per meeting, from this survey was $18,211. Total impact for the 14 meetings is estimated at over $250,000. Total impact from all meetings and demonstrations is over $1.5 million dollars. Extended impact (impact beyond direct effects from meetings) is larger. A 1% increase in calf crop will increase income by almost $5 million. Given the serious sulfur to copper imbalance

revealed in this study, and the fact that mineral companies have aggressively responded by reformulating mineral supplements and developing their own educational programs, the effects due to improved reproduction will be in the $10-20 million range. If only 25% of cattle are affected, the impact is still at least $2.5 million.

Increasing the value of feeder calves by increasing immune systems will result in animals worth $4 to $6 more per hundred pounds. If only 3 of calves bring an additional $4, the impact will be $4 million per year. Decreasing the cost of treating stressed, sick calves is another benefit. If it costs an average of $10 per head to treat a calf and the number was decreased by 5 percent, the financial impact will be $100,000. Total impact of the program prior to 2005 was estimated at $8 million (counting an estimate of impact outside of Tennessee). Additional impact due to 24 meetings in 2005 is estimated at $437,000.

Funding: Hatch; Smith-Lever

Scope of Impact: State-specific; Integrated

Title: Crossbreeding Improves Survival in Dairy Cattle

Issue: On farm cow death is now the leading reason why milking-age cows exit dairy herds in Tennessee and the United States. Annual cow death rates in Tennessee are approximately 8-10% and may be as high as 15-20% in many herds. These death losses are an enormous financial burden to dairy producers as well as an important animal welfare concern. The hybrid vigor provided by crossbreeding is one tool to address these problems.

What has been done: Nine commercial herds in Tennessee have used approximately 750 units of semen from available Swedish Red sires. Holstein, Jersey and some crossbred cows were serviced with the Swedish Red semen and contemporary Holstein and Jersey semen during 2003 and 2004. The oldest heifers from these matings are at breeding age. We have demonstrated that Swedish Red sired calves (crossbred calves) can be managed like current US dairy breeds. In addition, may other herds have used traditional US dairy breeds in crossing programs to improve health and survival of their cattle.

Impact: We now have between 25 and 50% of the dairy farms in Tennessee that are using some level of crossbreeding. Crossbred calves and cows are healthier with increased survival that ultimately leads to more profitable dairy herds.

Funding: Hatch

Scope of Impact: State Specific

Title: Feeder Cattle Marketing Alliances

Issue: Tennessee has many small cow calf producers who do not have a sufficient number of calves to command a premium in the market. Furthermore, most of the calves are sold

unweaned and without proper vaccinations and preconditioning prior to sale. Therefore, buyers discount the price of calves due to the increased risk of sickness and possible death loss. Research has shown that larger groups of calves sold in truckloads of 48,000 to 50,000 pounds bring higher prices than calves sold as singles or very small groups. In addition, buyers are demanding that calves be preconditioned in order to command full value.

What has been done: In Hawkins County meetings were held to inform beef producers of the benefits and profit opportunities if they would properly wean and vaccinate their calves and then market them in a cooperative marketing activity in which truckloads of 48,000 to 50,000 pounds would be sold. Producers became Beef Quality Assurance certified to insure that vaccinations were properly given and that records were kept of those treatments. A weaning demonstration was conducted to show producers that the weight gained over a 60 day period of time could more than pay for the feed and materials. The Wilson Livestock Network (a video sale marketing agency) was contacted regarding handling the sale of the cattle. Local producer leadership in the Hawkins County Cattleman's Association helped develop the sale with advice from Extension.

Impact: In 2005, 45 loads of cattle (50,000 pounds each) were sold through the Wilson Livestock Network. This amounted to 3,400 head valued at $2,028,000. Compared to average Tennessee auction prices, these producers averaged $87.50 per head of additional income or a total of $306,250. This cooperative marketing alliance has 70 producers from 10 counties in three states.

Funding: Smith-Lever

Scope of Impact: Mulitstate (Alabama, Kentucky and Virginia)

Title: Education for Horse Owners

Issue: New horse owners in Tennessee do not have the knowledge to properly care for and manage horses. Therefore, most are seeking reliable information on management, care and health of their horses.

What has been done: UT Extension made 39,822 statewide contacts in horse production, and 58 Tennessee counties conducted horse programming based on local needs assessment. Programming included advising horse ownership group in developing trails; 4-H horse judging and hippology activities; forage production meetings; multi-session horse ownership meetings; special interest classes; newsletters; and farm visits. In a continuing effort, a series of 20 winter educational meetings targeted at the new/novice horse owner. Teaching materials included fact sheets, slide presentations, videos, nutritional feed samples and plastinated parts of the horse's digestive tract.

Impact: Over 1,785 horse owners representing more than 7,700 horses participated in educational meetings with 10% 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 program, most horse owners indicated a decrease in feed costs of $12 per head per month and this represents over $100,000 savings in feed costs due to improved management skills and knowledge.

In Carter County, 10 producers vaccinated for West Nile virus through the efforts of Extension and increased forage quality on 210 acres valued at $2,500 due to the 210 acres.

In Fentress County, 12 4-H members participated in Horse Judging in 2005. Those 12 members were surveyed in the area of oral reasons. 92% felt they had acquired skills need to communicate their decision by practicing oral reasons and 66% felt they had improved communication skills because of the program.

In Shelby County, the horse management program provided information to over 1000 people from Tennessee and Mississippi. Using a post-then-pre questionnaire revealed the following average increases in knowledge:

- 28% average increase in knowledge regarding choosing the right truck and trailer,
- 43% average increase in knowledge in equine dentistry, and
- 23% average increase in knowledge in first aid and vital signs.

Comments from participants included the following:
- "I will begin better pasture management and rotate my pastures"
- "I will re-evaluate my vaccination program."
- "It is good to know what is normal to know when something is an emergency."
- "I will get a round pen and work to build a relationship with my horses."
- "I will start getting routine checkups on my horses' teeth after age 6."
- "I feel like I can handle a small emergency at my barn and now know what is essential to keep in my horse first aid kit."
- "I will plant clover to feed my horses before the Bermuda comes back."

In Rhea County, a post-then-pre evaluation questionnaire showed the following results:
- Twelve participants planned to adopt the material presented at the meetings including hay quality and nutrition, matching nutrition to body condition score, proper nutrition and feeding, forage and soil testing and making a horse first aid kit.
- Participants had a 55% increase in their knowledge of NRCS cost-share programs and technical assistance.
- Participants had a 43% increase in their knowledge of forage and soil testing.

In Rutherford County, follow-up interviews with 26 participants in the horse owner's pasture/forage special interest program showed that:
- Six participants improved their pastures by adding new, more persistent Durana white clover.

- Eight owners/producers reported improved (over previous attempts) control of tough weeds such as multiflora rose and blackberry by following field day recommendations.
- Ten producers indicated they intend to adopt a recommended program for horse nettle, tall ironweed and buckhorn plantain control.

Funding: Smith-Lever

Scope of Impact: Multistate (Mississippi)

Title: Minimizing Soybean Rust on Tennessee Soybean Production

Issue: Asian soybean rust has the potential to destroy 50% of the soybean crop in Tennessee valued at $138 million. There is no resistance to soybean rust in any commercially available soybean cultivar. Fungicides exist that will slow the spread of the pathogen but they require significant additional input costs for growers. It is critical that sensitive and rapid diagnostic methods are available to detect soybean rust at the earliest stage possible. This will allow producers to apply fungicides that limit the impact and spread of the disease.

What has been done: An aggressive early detection program was coordinated and implemented to screen symptomatic and non-symptomatic soybean tissue on a weekly basis for the presence of rust at 32 locations throughout Tennessee starting in the spring of 2005. Over 350 farmers and technicians were trained in the ten workshops held in Middle and West Tennessee in 2005. Many more farmers and technicians attended county and regional meetings where soybean rust topics were taught. In addition, a study was conducted with researchers at the USDA-ARS, Foreign Disease-Weed Science Research Unit, the USDA-APHIS PPQ CPHST National Plant Germplasm and Biotechnology Laboratory, and six major universities to test the effectiveness of two DNA-based tests to determine the earliest time points that rust can be detected.

Impact: Rust was found in surrounding states in 2005, but because our sentinel plots were planted and found no rust in Tennessee, farmers could forego treatment. That alone was a savings of as much as $15 per acre. From May through October 2005 over 30,000 soybean leaves from key locations throughout Tennessee were assessed for the presence of soybean rust. A real-time PCR assay was validated at 8 major US laboratories demonstrating that rust can be reliably detected six to 10 days prior to visible rust lesions on the plants. An integrated network for early detection of rust was developed that includes shareholders, agents, scientists, and industry.

Funding: Hatch; Tennessee Soybean Promotion Board

Scope of Impact: State-specific

Title: Cotton Disease Control Program

Issue: Cotton producers are loosing 10 % of their crop to seedling diseases and nematodes.

What has been done: On the farm demonstration plots were utilized to show producers and professionals the value of fungicide seed treatments and in-furrow; 67 fungicide treatments were tested in eight replicated plots. In addition, 46 treatments were tested in six replicated plots. Several field days were held and results were shown to producer and information was disseminated in hard copy and on the UT web site. A nematode survey was conducted to demonstrate to producers that this nematode is increasing and can cause severe problems in cotton production.

Impact: These programs are resulting in cotton producers improving their seedling disease and nematode control and increasing their production and profits. On farm demonstrations and research results show an increase in profits by $100- $150 per acre. About 50% of producers are using superior seed treatments instead of in-furrow fungicides. This has eliminated the need for more hazardous and costly chemicals for both seedling diseases and nematode control.

Funding: Smith-Lever; Cotton Inc.; various industry grants

Scope of Impact: State-specific

Title: Cotton Agronomy and Physiology Research

Issue: Cotton is grown on over 600,000 acres in Tennessee and provides nearly $250 million in farm receipts. Although production costs have increased, prices have remained stagnant thereby causing narrower profit margins. Up-to-date information is needed for cotton to remain sustainable and profitable. Profitable crop management remains challenging as yields and fiber quality fluctuate from year to year, while costly new technologies are offered to producers. Improved cultivars, management practices, and cropping systems can improve Tennessee cotton production efficiency. Agronomic research is needed to develop more profitable, sustainable, and technically sound production systems. Physiology research is also needed to improve the efficiency of yield formation in cotton.

What has been done: In 2005, the Cotton Agronomy and Physiology Research Project evaluated the growth and development traits of 33 new experimental and transgenic cotton varieties in a grower-supported study. In addition, the program continued a nitrogen and potassium nutrition study of contrasting varieties in long-term soil fertility plots, and shared results with producers through field days. A multistate accomplishment was collaborating in a regional core-funded project to evaluate the stability of yield and fiber properties of cotton germplasm tested in the North Delta region. A research program in cotton agronomy evaluating transgenic variety adaptation, plant growth regulation, new cropping systems, and harvest aids of cotton was conducted in Tennessee. In addition to variety adaptation, identification of cropping

systems that build on no-till systems was evaluated in terms of yield, fiber quality, physiological efficiency and economic potential. This research contributes knowledge needed to develop more profitable, sustainable and technically sound production systems. In Jackson, research results and production topics were discussed with 350 participants at the Annual Cotton Focus meeting. Our weekly web report provides insight to potential problems and answers to questions as they arise. In 2005, the UT IPM newsletter was downloaded 12,197 times.

Impact: The project reported that planting cotton in a skip-row pattern can reduce costs to producers with minimal loss of lint yield or earliness, if row width is reduced from the traditional wide spacing. This information was directly beneficial to Tennessee producers who wish to reduce planting costs. The Project's early evaluation of new cotton varieties influenced decisions of seed companies to release and market new cultivars in Tennessee in 2005. Growth and development traits contributing to yield and earliness of maturity were reported to producers and seed industry.

In 2005, 85% of the acreage was planted to cotton varieties that were in the highest yielding variety group within the cotton variety test. The difference in yield between the highest yielding group and the second highest yielding group was 155 lbs. of lint. According to the USDA, a total of 521,900 acres were planted to varieties proven to out-yield other varieties. If we assume a 155 lb. yield difference on the remaining 92,100 acres of cotton planted in Tennessee at an average loan price of $0.52 per pound and the projected state average of 862 pounds per acre, then the difference would equate to over $40 million in lost state revenue.

Funding: Hatch; Smith-Lever; Cotton Incorporated; Gift Funding

Scope of Impact: Multistate (Cotton States)

Title: Soybean Cyst Nematode Resistance

Issue: Soybean cyst nematode (SCN) is currently the most damaging pest to USA soybean production, resulting in $1 billion annual crop losses.

What has been done: Genetic resistance is the only viable means to combat the SCN pathogen. In 2005, the Tennessee Agricultural Experiment Station and the USDA Agricultural Research Service jointly developed and released a new soybean germplasm line (JTN-5303) with resistance to multiple races of SCN.

Impact: JTN-5303 is currently being accessed by public and commercial breeders to incorporate SCN resistance throughout major soybean production regions. This line is resistant to every major race of SCN in Tennessee, resulting in improved, sustainable crop production. An estimated $9 million in crop loss in Tennessee alone can be eliminated through SCN resistance.

Funding: Hatch; Tennessee Soybean Promotion Board

Scope of Impact: State-specific

Title: Soybean Disease Control Program

Issue: Soybean producers are loosing and average of 25 % of their production potential to diseases and nematodes. They are also concerned about the possibility of soybean rust causing even more damage should it become epidemic in Tennessee.

What has been done: Disease nurseries containing 381 soybean varieties were rated for the major diseases in 2005. These ratings and yields were distributed to Extension agents, producers, seed companies, breeders, chemical companies and others. The UT web site (utcrops.com) was used to disseminate this information as well as hard copies were handed out at producer meetings. There were 70 producer meeting held across the state with over 2000 attending. Soybean disease control and soybean rust was discussed in detail at all of these meetings. A soybean promotion board grant was awarded to purchase microscopic equipment to train approximately 200 professional soybean workers as first detectors for soybean rust detection. Thirty soybean rust sentinel plots and 10 spore traps were established and scouted on a weekly basis across the state at strategic location for early detection of infection and spores of soybean rust. Several trips to infested areas in Florida, Alabama and Brazil where utilized to gain more first hand expertise in diagnosing soybean rust.

Impact: Soybean producers are 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. This has increased productions levels for many producers by $50 to $100 per acre. Statewide this program has increased soybean profits by $ 100 million.

Funding: Smith-Lever; Tennessee Soybean Promotion Board; various industry grants

Scope of Impact: State-specific

Title: Cereal Breeding

Issue: Improved corn varieties are needed to increase productivity and efficiency. Continued genetic improvement will allow the U.S. to maintain the cheapest and safest food supply in the world.

What has been done: UT research developed corn parental line T175.

Impact: Corn parental line T175 was released to seed producers and breeders to produce new hybrid varieties that are more productive than current varieties.

Funding: Hatch

Scope of Impact: State specific

Title: Integrated Weed Management in Agronomic Crops

Issue: Weeds in crops lowers yields and quality. Recent years have seen the wide-spread adoption of Roundup Ready varieties in cotton, soybeans, and corn. The use of these varieties coupled with lower glyphosate (Roundup) costs has allowed for effective weed control, even in no-tillage systems. However, some weeds have adapted to this system by producing plants that are not controlled by glyphosate.

What has been done: Previous research has confirmed lack of control of horseweed in more than 2 million acres of Tennessee crops. There is also a recent revelation of a new weedy pigweed species (Palmer amaranth) that is not controlled by normal applications of glyphosate. The UT Research and Extension team produced effective management tools to allow producers to maintain weed control under no-tillage systems while still producing crops with maximum efficiency.

Impact: The advantages of keeping Tennessee farmland in no-tillage systems resulted in environmental benefits due to reduced soil erosion, and resultant water quality improvements. Tennessee producers of feed and fiber crops now compete on a global basis, and the recommendations from this research project saved our farmers from excessive herbicide applications. A reduction in weed control costs of $3 per acre saved Tennessee farmers $7.8 million in 2005. This not only reduces their costs, but also minimizes environmental loadings of herbicides and other possible contaminants such as phosphate, etc from Tennessee surface waters.

Funding: Hatch

Scope of Impact: State-specific

1.3 Key Theme: Innovative Farming Techniques

Title: Agricultural Structures and Livestock Production Facilities Planning

Issue: Tennesseans in agriculture have multiple educational needs when planning and constructing livestock facilities. Some of these needs include: adequate planning, good site selection, efficient farmstead arrangement, and proper ventilation.

What has been done: On-site planning assistance was provided to 13 different agricultural producers to demonstrate the cost effectiveness of forward planning in the construction of their

facilities. Seven special plans were prepared to assist these and other producers in planning their new and/or remodeled agricultural facilities. Planning assistance was also provided to five agricultural community organizations. Five special plans were prepared to assist these organizations in planning various types of new and/or remodeled facilities. Tennessee Extension agents reported an additional 1,316 educational contacts regarding livestock structures and facilities.

Approximately 1400 standard plans for a wide variety of agricultural structures and livestock facilities were distributed. Approximately 53 percent (742) of these plans were distributed to Tennessee residents. Most of the requests for plans were generated as a result of posting the *Agricultural Building and Equipment Plan List* on the UT website. Internet requests from 249 individuals for 1396 plans were received. These requests came from Tennessee, 36 other states, one territory and seven foreign countries. In an effort to reduce the time and expense required for mailing plans, an additional seven plans were listed on the web site for direct access and download by on-line visitors. The use of these electronic files has continued to increase as they were accessed over 495,000 times during 2005.

Impact: The estimated construction value of the seven producers and five community organizations assisted is at least $3.4 million. Conservatively, the 13 agricultural producers which were assisted experienced an average savings of at least $4000 in construction costs. In other words, a total construction cost savings of $52,000 resulted from the use of research-based planning advice on these farms. The savings were mainly from decreased costs of concrete in the suggested plans compared to what would have been used in the producers' original planning ideas. Agricultural structures and facilities represent long term investments, so the benefits of sound forward planning are not all evidenced immediately. The use of more efficient facilities will reduce the average operating costs on these 13 farms by at least $125 per month over the twenty-year life of the facilities. So, the total operating cost savings is estimated at $390,000. The long term savings will stem primarily from reduced labor for cleaning, reduced maintenance, and increased production resulting from improved animal comfort.

Funding: Smith-Lever

Scope of Impact: International

Title: Irrigation for Humid Regions – Maximizing Economic Return and Minimizing Non-Point 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 pollution.

What has been done: Various field research and extension projects were continued, improved, and new projects were initiated in 2005. Research and demonstration plots were established to improve irrigation practices in most of Tennessee's major crop enterprises: tobacco, forage, vegetable, nursery, and row crops. Research was pursued on UT Research and Education Centers and through on-farm demonstrations with both researchers and extension personnel; and 487 producers and professionals were trained in irrigation design, installation, and management at 15 presentations given at workshops, field days, and in-service training sessions.

Impact: Because of this research and extension program, improved irrigation scheduling methods were implemented by 50 West Tennessee producers who farm over 30,000 acres of row crops.

Funding: Hatch; Smith-Lever

Scope of Impact: State-specific; Integrated Research and Extension

1.4 Key Theme: Urban Gardening and Home Horticulture

Title: Nashville Community Gardening

Issue: In Tennessee 72% of the population does not eat the recommended five or more servings of fruits and vegetables per day. Community gardening can help reduce this figure. Community gardening in an urban setting such as Nashville enables limited resource residents to gain access to fresh produce while simultaneously aiding in local food production. Community gardening is community resource development. It aids people to develop life supporting and life sustaining skills that helps to improve the overall economic development of the community.

What has been done: The TSU Extension Agent worked with a team to plan and conduct the Community Gardening Training Program. The program began in the winter of 2005 and was completed in the late fall of 2005. The program consisted of lectures, workshops, demonstrations, and hands-on gardening techniques with emphasis on how to plan, care, grow, harvest and preserve vegetables. The program provided education on specific topics addressing disease, weed and insect control and health and nutrition benefits of fresh home grown vegetables. The agent partnered with the TSU specialist and farm manger to conduct the program. A pre/post test and observation were used to evaluate the program.

Impact: 25 participants increased their knowledge and developed skills of producing vegetables in a home garden:

- 85% increased their knowledge on recommended soil preparation.

- 85% developed skills of planting seeds and setting transplants.
- 92% increased their knowledge and developed skills of irrigation and watering plants
- 100% learned about disease, insect, and weed control
- 100% increased their knowledge and developed skills on the correct use of tools and harvesting techniques.
- 100 % increased their knowledge of vegetable nutrition.
- 100% increased their knowledge of health benefit of eating fresh vegetables.
- 100 % developed skills in measuring standard serving and portion sizes.
- 92% increased their knowledge of vegetable (food) preservation.
- 92% increased their physical activity by growing a vegetable garden.
- 100% adopted the practice of harvesting vegetables at peak quality.
- 100% adopted the practice of including a variety of vegetables in their diet.
- 92% adopted the practice of using recommended disease, weed and insect control.

Funding: NARETPA Section 1444 and 1445; TSU Creative Program Delivery Enhancement Grant

Scope of Impact: State-specific

Title: Master Gardeners Grow Community Pride

Issue: Tennessee citizens continue to exhibit a much interest in consumer horticulture due to many factors including gardening as a hobby and residential growth in many parts o the state. Various needs assessment strategies (including input from stakeholder groups, input from county advisory councils and examining participation records of the local Extension offices) shows the need for programs in horticultural education and volunteerism.

What has been done: Tennessee Master Gardeners are trained volunteers that assist UT and TSU Extension to share the latest gardening information. All volunteers are trained with 40 hours of horticultural classes and return 40 hours of volunteer community service through their local Extension office. State-wide there are approximately 2,000 active Master Gardeners in 44 counties. Master Gardeners who continue to participate in the program return at least 25 hours of service with a minimum of 8 continued education hours annually.

Impact: In Rhea County, eight Master Gardner interns and 20 Master Gardener members reported 600 hours of volunteer service to their community. Valued at $10 per hour, their volunteer service was worth $6,000 to the community.

In Dyer County, 20 Master Gardeners completed 30 flower gardens throughout the county under the leadership of the TSU Extension Agent. In addition, 57 new trees were planted in Okeena Park, the largest park in Dyersburg.

In Bledsoe County, a 55% increase in knowledge was reported from a pre-test and post-test completed by 13 Master Gardeners. Master Gardeners indicated that:

- 53% now follow soil test recommendations.
- 50% now choose landscape plants based on site.
- 33% now select plant varieties that are resistant to disease or insects.
- 29% now identify a pest before control measures are decided.

Master Gardeners have donated more than 4600 hours of educational programming and community service in Williamson County. The value of volunteer hours (valued at $17.55 per hour by the Independent Sector), the value of volunteer service would exceed $80,000.

In Summer County, a questionnaire provided an opportunity for participants to reflect on horticultural knowledge and skill levels before and after receiving training. The greatest increases in knowledge were in the areas of organic gardening (85%), water gardens (84%), urban forestry (80%), wildflowers (73%), and the use of native trees and shrubs in the landscape (72%). A 35% increase in knowledge of vegetable gardening further validated responses in other areas. Overall knowledge increase in twelve areas was 64%.

In Madison County, the increase in volunteerism indicates the aspiration levels of interns and members continue to be strong. As evidence the average hours of volunteerism reported per intern graduating increased from 42.6 hours in 2004 to 47 hours in 2005. The average hours of volunteerism reported per recertifying member increased from 21.1 hours in 2004 to 23.8 hours in 2005. The average hours of continuing education received per recertifying member increased from 15.8 in 2004 to 17.1 in 2005.

Funding: Smith-Lever; NARETPA Section 1444 and 1445

Scope of Impact: State-specific; Multi-institutional

Title: TSU Memphis Urban Gardening Program

Issue: TSU Extension conducted needs assessments in the City of Memphis that revealed the City's vacant lot conditions in urban neighborhoods needed much improvement, and opportunities for gardening and community development were limited. Also, residents needed skills and knowledge in gardening, food preservation, and community activism.

What has been done: TSU Extension created 12 community gardens throughout Memphis-Shelby County. In addition, TSU distributed gardening newsletters, conducted educational meetings, and showcased gardening with numerous neighborhood demonstrations. TSU Extension promoted the Memphis Urban Gardening program and encouraged Shelby County citizens to enroll. An advisory committee of 26 volunteer leaders assisted with the program. 24 Master Gardener students volunteered to earn community service hours by assisting with vacant lot clean-up, packaging seeds, and judging produce. TSU Extension also conducted a study tour

for 159 residents who attended the Small Farm Expo on the TSU Farms in Cheatham County. TSU collaborated with UT Extension to conduct a food preservation demonstration in fruits and vegetables for 15 participants.

Impact: In 2005, over 500 limited-income adults, youth, and individuals with disabilities participated in the program, and produced over 20,000 pounds of fresh produce.

- $150,000 of food cost was saved by gardeners growing their own produce.
- Adults and youth gained knowledge through educational meetings and hands-on gardening experience.
- 147 new gardeners were added to the program.

Funding: NARETPA Section 1444 and 1445; Smith-Lever; City of Memphis Housing and Community Development Block Grant

Scope of Impact: State-specific; Multi-Institutional

Title: UT Extension's Consumer Horticulture TV Program

Issue: The public has an immense need for research-based information in home horticulture. Consumer horticulture impacts home value, environmental quality and the economy. Key issues for home horticulture in East Tennessee were identified as the need to improve pruning techniques, the need to improve pesticide safety and use, and the need to build awareness of local products.

What has been done: UT Extension agents and specialists reported 57,289 educational contacts in consumer horticulture in 2005 through group meetings, direct mail, office visits, site visits and other venues. As part of the 2005 effort, a UT Extension Agent completed 144 horticultural segments on a Knoxville TV station, WBIR. If the production cost were incurred by UT Extension, the cost would have been $504,000. The segments aired over 52 weeks to viewers in East Tennessee, Southeast Kentucky and Southwest Virginia.

Impact: After the segments on pruning, UT Extension of Knox County received 36 follow-up inquires by email alone. Two local arborists reported that they received eight jobs juts from those responses. Marketing Knox County greenhouse plants was a notable outcome. Stanley's Greenhouse reported a $1000 increase in sales over the previous year after the UT Extension segment on forced bulbs during winter months. Meadowview Greenhouse reported increased business traffic; for example, after the segment on camellias, they sold 48 shrubs the next day.

Funding: Smith-Lever; WBIR TV

Scope of Impact: State-specific

1.4 Key Theme: Fruit/Vegetable Production

Title: Controlling Bacterial Diseases of Tomato in Tennessee

Issue: Bacterial spot and bacterial speck are two of the most important diseases of tomatoes in Tennessee. Very few products are available to control them, and cultural control practices are limited.

What has been done: Alternative control products were tested for their effectiveness against bacterial diseases and found to be ineffective. An earlier field test on an organic control product, AgriPhage, indicated that it had some promise.

Impact: The research and educational program resulted in a savings of $150,000 in 2005 to the state's tomato growers.

Funding: Hatch; Smith-Lever

Scope of Impact: State-specific

Title: Cucurbit Powdery Mildew Control in Tennessee

Issue: Powdery mildew is a common disease of cucurbit crops such as pumpkins and squash. It is controlled primarily with fungicides. Control was becoming more difficult because the recommended spray program was not performing as well as it had been.

What has been done: After surveying pumpkin growers' fields and confirming that powdery mildew had developed resistance to one of the primary fungicide classes, the strobilurins were removed from the powdery mildew recommendations and growers were advised not to use them. Adjustments were made in the cucurbit spray program for other diseases.

Impact: The survey and educational program resulted in a savings of $350,000 to growers of cucurbit crops in disease-loss prevention, and $150,000 in the use of ineffective fungicides.

Funding: Smith-Lever

Scope of Impact: State-specific

Title: Improving Fruit & Vegetable Production and Marketing

Issue: Grainger County is the largest producer of tomatoes in the state. Tomatoes make up 62% of total crop income for the county. The estimated income to the county from tomatoes is $10 million with over 500 greenhouses in the county. Other key crops included strawberries, peppers, beans and onions.

What has been done: UT Extension co-planned and promoted Vegetable Winter School and held an Annual Vegetable/Fruit Field Day. Topics covered included tomato disease and insect control. Farm visits, group meetings and various media outlets were used to deliver this program.

Impact: UT Extension worked with 15 tomato producers in disease control plan saved 45 acres of tomatoes from late blight which would have not been harvested. After verifying with five different producers, they responded that they averaged 1800 boxes per acre and the price averaged $7. They also discussed that all boxes will not sell. They averaged 60% of all boxes per acre sold. An acre was valued at $7,560 in 2005. Therefore the impact for saving 45 acres equals $340,200.

The program also assisted six producers to save 11 tomato greenhouses. Average gross returns equal $9,000 per house. After verifying with 5 different producers, they responded selling 88% of all greenhouse production. A greenhouse was valued at $7,920 in 2005. Thus, impact for saving 11 greenhouses equals $87,120.

Additionally, 29 tomato producers were educated about insect control issues. This saved eight greenhouses and 52 acres, valued at $456,480.

Two pepper producers were assisted in saving four acres of pepper. One acre of pepper averages 1,400 boxes valued at $8 per box and produces $11,200 in gross income. Therefore, the four acres saved yielded $44,800 income.

21producers with 122 acres in tomatoes were assisted in one-on-one consultations in soil fertility issues. 60% of crop had poor pH levels. 35% had poor nutrient levels. Through the Extension Agent's recommendations, a 55% production increase per acre resulted in 134,200 boxes equaling $939,400.

Funding: Smith-Lever

Scope of Impact: State-specific

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

Title: Tennessee Turfgrass Research Field Days

Issue: Turfgrass professionals in Tennessee needed to know the latest research in their field for issues that are highly important to their industry.

What has been done: In 2005, UT Extension conducted research field days highlighting turfgrass research in Tennessee. Field day demonstrations conducted were: Dallisgrass management, proper application and timing of pre-emergence herbicides for crabgrass and goosegrass management, yellow nutsedge and Virginia buttonweed management, management of heat-tolerant bluegrass, warm-season turfgrass establishment, cool-season turfgrass establishment, scouting and non-pesticide control of insects and diseases.

Impact: Approximately 235 turfgrass professionals attended our field days. Because of these field days, attendees reported:

- greater knowledge of proper safe pesticide usage;
- improved cultural management practices for greater water conservation;
- greater knowledge of methods to reduce soil erosion during turfgrass establishment; and
- reduced management costs of turfgrass.

Funding: Smith-Lever; Hatch

Scope of Impact: State-specific; Integrated Research and Extension

Title: Nursery Production

Issue: In DeKalb County, the income from the sale of nursery products is the single largest source of farm income. A survey of nursery producers in DeKalb and the other major nursery producing counties was conducted asking area producers which issues should be addressed through Extension programs. After the issues were identified they were prioritized by a group of area nursery producers assisted by Extension Agents and regional Extension Program Leader, and pest control was identified as the major issue.

Nursery production by acres in Grundy County has increased more than 68% since 1997. More than 3013 acres of nursery and greenhouse products were grown on 101 different farms in Grundy County. Since 1997, nursery sales in the county have increased of over 50%.

What Has Been Done: UT Extension coordinated a nursery educational program consisting of group meetings, office calls, and farm visits. Also, radio programs were used to build awareness.

Impacts: A pre and post-test of 35 DeKalb County nursery producers revealed a 19% increase in knowledge of and skills in specific pesticide usage practices. The average pretest score was 47, and the average post test score was 66.

Grundy County had 114 nursery producers involved in educational meetings. They were taught recommended production and management, marketing practices and pest management. Follow-up evaluations, pre-tests and post-tests comparisons demonstrated an average 49% knowledge gain. Specific outcome included:

- 41% increase in knowledge on nursery marketing.
- 48% gained knowledge on potential pest problems in the nursery
- 54% gain in knowledge on proper pesticide storage, handling, and safety.
- 45% gain in knowledge and skills on nursery financial records management.
- 63% increase in knowledge on soil qualities for nursery crops as well as the pest update.
- 92% of all nursery producers attending all horticulture educational programs plan to adopt or utilize the information.
- 98% of the producers attending the nursery pest update educational program responded that they planned to adopt or utilize the information from the program.
- One Grundy County nursery producer commented that the UT Extension Agent and UT Area Extension Specialist have saved him hundreds of thousands of dollars with recommended pest control measures through farm visits and quick diagnostics of insects and diseases.

Funding: Smith-Lever

Scope of Impact: State-specific

1.6 Key Theme: Small Farm Viability

Title: TSU Targets Small Farm Production/Demonstration

Issue: According to the 2002 USDA Census of Agriculture, 85,662 farms in Tennessee (97%) are considered small farms. This represents farms with sales less than $250,000. The major issues facing small farmers are economic: cash flow, income and return on investment, asset development, product marketing and risk management. Although production of major agronomic crops and commercial vegetables are concentrated in large farming operations, small farmers are extremely valuable in providing niche and specialty goods and services locally and directly to consumers. Small farming operations have positive and social effects on the local economic and community.

What has been done: The total Extension educational contacts for small and limited resource farmers totaled 4,493 in 2005. The TSU Research and Extension Demonstration Farm was used as a vehicle to reach small and limited resource farmers. The Third Tuesday Educational Workshops programs reached over 300 growers in 2005. The workshops were conducted on current issues and enterprises for small farmers: ornamentals, turfgrass and landscape management, agroforestry, geographical position system, commercial pest management, goat production, sweet potato production and marketing.

Impact: A sweet potato variety trial was conducted on Tennessee State University Research and Demonstration Farm. An additional on-farm trial was conducted in Montgomery County using gypsum as a soil amendment. According to the results, the farmer yielded 450 bushels per acre on the sweet potato trial and 172 bushels per acre on the control. This is a yield increase of

278 bushels per acre. At an average price of $15 per bushel, this yielded gross income of $4,170 per acre.

Funding: NARETPA Section 1444 and 1445

Scope of Impact: State-specific; Integrated Research and Extension

Title: Meat Goat Management

Issue: Goat production is a growing industry in Lower Middle Tennessee. According to the Farm Service Agency in 2004, there are approximately 81 goat farms located in Giles County, 67 goat producers recognized in Lincoln County, and 63 goat producers registered in Maury County. With such numbers of goats, educational programs and workshops offered by TSU/UT Extension assisted these producers in everyday situations such as record keeping, enterprise budgeting, nutrition, parasites, genetics, and marketing practices associated with goat production.

What has been done: The specialist worked with other county agents and the state small ruminant specialist to plan and conduct educational programs and workshops. The meetings and workshops were held as single and multi-county programs to include Lower Middle Tennessee producers. The specialist developed newsletters, mailed personal invitations, posted flyers, wrote press releases, and conducted radio programs focused on improving goat herds. The specialist made contact with over 136 goat producers in Giles, Lincoln and surrounding counties and assisted with record keeping and enterprise budgeting. Sponsorship was secured for a two-day "Managing Meat Goats for Profits" Workshop. The workshop provided an opportunity for participants to receive research-based information on pasture management, nutrition, and enterprise budgeting. The specialist conducted a meat goat fecal egg count meeting for local meat goat producers. Participants received detailed information and hands-on training using a microscope of Impact to locate and determine how many worm eggs were present inside a particular meat goat. The agent performed a demonstration of taking proper fecal egg count sample using salt water, goat feces, grid slide, plastic bags and a microscope of Impact. The specialist provided one-on-one assistance in record keeping and best management practices to 60 meat goat producers. The specialist also worked in partnership with NRCS and FSA to identify limited-resource producers interested in cost-share funds to enhance fencing and water quality for farm operation. The specialist also partnered with UT agents, TSU agents and specialists, and local Co-op.

Impact: According to questionnaire results and end-of-program surveys, 89 producers out of 136 or 65% noted they took what was taught in meetings and workshops and applied it to their own farm situation. As a result of this program:

- 37 meat goat producers reported increased income of $131,000 in kid, doe, and buck sales for 2005 (one producer selling all 42 does/kids , 2 bucks, and 2 Great Pyrenees dogs for over $27,000).

- 58 goat farmers improved fencing and facilities for their goat herd.
- 84 producers noted an increase in meat goat sales by targeting certain ethnicities, holidays, and auction market sales
- 47 producers adopted a record keeping system to better keep up with birth dates, breeding dates, and sire information.

Funding: NARETPA Section 1444 and 1445

Scope of Impact: State-specific

Title: Land Ownership Information Project

Issue: According to the 2002 Census of Agriculture, there are 87,595 farms in Tennessee. There were 836 Spanish origin or Hispanic farmers, and 102 Asian farmers operating farms. There were 1,266 African American farmers in Tennessee, operating 1,117 farms. Land ownership tied to farming in general has decreased greatly. This is reflected best within the African American communities where the ownership of farm properties has drastically declined. The exodus 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 education program that will address estate planning, making wills, getting legal help, and property ownership rights and responsibilities.

What has been done: Workshops were conducted this year on Land Ownership and Women in Land Ownership. A Landownership Information exhibit was displayed at the Relative/Grandparents as Caregivers of Dependent Children Seminar in Rutherford County. Land ownership educational information has been prepared and provided to African American farmers through fact sheets, newsletters, appearance on a radio program, and meetings. The Tennessee Small Farmer Recognition Committee helped to organize the Small Farm Awards Program and Small Farms Expo.

Impacts:

- 57 landowners and farmers increased knowledge of estate planning, legal issues, heir property, and government land programs from the two land ownership workshops.
- 117 individuals attending the Caregivers Seminar gained more knowledge about writing wills, the importance of estate planning, and retirement planning. Four fact sheets were developed on wills, adverse possession, mineral and air rights, and eminent domain.
- The Second Tennessee Small Farmer Recognition Program was held during the Small Farms Expo. Over 400 people gathered at the recognition. Small farm families were showcased as seven small farmers selected from different categories and income levels were honored along with their families and one overall winner was named Tennessee Star Small Farmer of the Year.

- 150 participants increased their knowledge of alternative enterprises that can be produced on a farm.

Funding: NARETPA Section 1444 and 1445

Scope of Impact: State-specific

Title: Improving Small-Scale Vegetable Production

Issue: In South Central Tennessee, most small-scale vegetable producers do not report to the Farm Service Agency office because financial assistance was not available. For this reason, small scale vegetable growers are often over-looked and under-represented. There was a need for small-scale vegetable producers who produce good, quality produce to serve local consumers.

What has been done: The TSU Extension Specialist met with an advisory committee to plan programs to serve small vegetable farmers in the area. The specialist conducted meetings emphasizing the importance of collecting soil samples to determine what nutrients were needed, if any, to get the maximum production from vegetables. The specialist prepared three demonstration sites in Giles County using commercial tomato and pepper plants. The specialist along with landowners prepared two raise-bed sites and one traditional planting site. Estimate yields were taken at two tomato plots and one pepper plot to determine comparison in yields by using commercial and non-commercial varieties. The specialist conducted an alternative agriculture workshop focusing on site selection, vegetable production, pesticide/herbicide use, and marketing of fresh fruits and vegetables. The specialist provided technical and educational assistance to local vegetable producers; developed a newsletter of timely tips to control weeds and wild grasses; and provided information on controlling insects and disease in home gardens. The specialist assisted over 89 vegetable growers in Giles and Lincoln counties by letters, word of mouth, newsletters, and by farm visits. Other partners included the local farmers cooperative and UT Extension agents.

Impact: According to end-of-program surveys, county fairs, word of mouth, and farm visits, 67 fruit and vegetable respondents noted a combined increase of $59,000 in crop sales after attending Extension meetings, obtaining technical assistance, and gaining more knowledge of organic farming. Of the 67 respondents:

- 75% noted a decrease in insect infestations, fugal and disease problems after applying UT recommendations and applications.
- 86% adopted management skills taught by agents and specialists
- 100% increased knowledge of raised-bed vegetable production and management (including three producers with hand-on experience with demo plots)

Funding: NARETPA Section 1444 and 1445; Smith-Lever

Scope of Impact: State-specific

Title: Improving Production and Marketing of Alternative Crops

Issue: The realization of the tobacco buyout, lower and unstable commodity prices, and decreased profit margins are forcing small farmers to diversify their product base (mainly through fruits and vegetables), add value to their products through production or processing techniques, and increase their ability to effectively market their products, which indirectly requires increasing the educational awareness of potential consumers. The target audience for this program includes small to mid-sized farm owners and producers, minority and/or underserved farmers and landowners who want to increase or supplement farm income through better production, management and implementation of alternative crops.

What has been done: Educational programs and workshops that help increase overall production and marketing of crops have been offered to producers and the general public. Research and demonstration plots have also been implemented on a variety of crops. Awareness of small farms and demand for fresh, local produce has also been increased through programs and dissemination of timely newsletters and publications. Some of the programs offered were: Alternative Ag Conference, Tennessee Statewide Organic Conference, Organic Certification Workshops, Basic and Community Gardening Courses, Marketing and Merchandising Your Fresh Produce, Montgomery County Ag Showcase, and demonstration plots. Specific topics included: Irrigation design, site selection for specialty crops, proper crop production practices, weed, pest, and insect management, value added techniques, processing requirements, organic production and certification regulations, and direct sales methods.

Impact: The Alternative Ag Conference addressed the production and marketing of suitable specialty crops in Middle Tennessee:

- 63 participants indicated that the workshop would help them save or earn a total of $49,500 due to better production methods or marketing.
- This is an average $2,750 increase per person.
- 81% of participants stated that they would be using information accessed at the conference to help them produce new specialty crops and/or pursue a new marketing approach.
- 55% were more likely to implement a suitable irrigation system and pesticide spray systems, thus saving money/increase profitability due to improved fruit quality, yields, and less pesticide use.

Three enterprises were expanded and four new enterprises are in development. One enterprise which expanded realized their complete farm loan payoff due in part to the addition of the agritourism component to their farm, while a second producer completely paid off their initial equipment investment within one specialty crop cycle, setting them up for the potential to realize greater profits in future seasons.

In the past three years over 185 people attended The Ag Showcase*:*

- 83% were previously unaware of one or more direct market or agritourism enterprises visited.
- 100% were willing to buy local products when available.

- 95% of attendees indicated that the Montgomery County Ag Showcase was highly beneficial in informing participants of available local specialty products.
- An average of $200 per family ($28,800) will be spent annually at these local, direct venues due to the interactive awareness program.
- 75% of merchants reported increased sales due to return visits or publicity from the event.

Funding: NARETPA Section 14445 and1445

Scope of Impact: State-specific

Title: Tennessee Agriability

Issue: Although the number of farmers with disabilities in Tennessee is not known, it is likely to be near the percentages for the general population. In 2000, 21% of Tennessee's population age 21-64 had a disability, and 53% were employed. Among this age group, 10% have mobility or self-care limiting disabilities, as did 44% of persons over age 65. Farmers and farm workers often do not obtain needed medical and rehabilitation services that can aid in recovery and return to work following disabling injuries or illnesses. This is due to a variety of factors, including low income, distances traveled to obtain treatment and rehabilitation services, and lack of knowledge of available services. Because most rehabilitation professionals and clinics are in urban areas, the lack of services is prevalent in rural areas.

What has been done: The Tennessee AgrAbility Project is a collaborative effort of the University of Tennessee Extension, Tennessee State University Cooperative Extension Program, Easter Seals Tennessee, and two Tennessee Technology Access Project affiliates. The project increases professional competencies for assisting farmers with disabilities and provides direct educational and on-site assistance to farmers, farm workers, and their family members that have disabilities. Over 600 Tennessee farmers have received direct education and assistance from the Tennessee AgrAbility Project since its inception in 1994. In 2005, 65 new farmer clients were assisted through on-site visits and workplace assessments, and workshops served 300 clients. The AgrAbility Project website has recorded more than 16,500 file requests in 2005.

Impact: In 2005, the program garnered multi-agency assistance for a couple desiring to start an agritainment venture, including purchase of a computer and assistance with appropriate computer workstation seating, purchase and building of a modified deck with ramp for their home, installation of double doors in their home for easy entrance and exit, a therapeutic hot tub for their physical therapy, and assistance with developing a business plan. Additionally, Extension specialists and others assisted with arranging financing for an appropriate tractor for the small farm, and a friend has converted the garden tiller to electric start with no labor charges. In another 2005 case, AgrAbility has provided assistance for an individual that is converting part of her farm to a therapeutic horseback riding program. Assistance included assessing needs for adaptive equipment to begin a therapeutic riding program for children and

adults with disabilities to improve their physical and cognitive abilities through therapeutic riding. All activities will take place in their newly constructed barn and riding arena.

Funding: Smith-Lever; NARETPA Section 1444 and 1445

Scope of Impact: State-specific; Multi-Institutional

1.7 Key Theme: Agrosecurity

Title: Tennessee's Agroterrorism Threat Demands Increased Security

Issue: Because of the continued threat levels from agroterrorism and Tennessee's vulnerability for attack, Tennessee Research and Extension activities include a focus on increasing security from agroterrorism.

What has been done: Plans were formulated and implemented by extension-led county coalitions. These coalitions completed an assessment of vulnerability to attack. The Agricultural Experiment Station conducted applied research on the efficacy of various means to secure applied field laboratories from terror threats. Additional research was conducted in the production of transgenic phytosensor plants to detect plant pathogens and for the sensing of explosives in the soil and water; breeding program research studying improvements in genetics to remove undesirable traits such as mastitis; and apple cider research that evaluated the addition of dimethyl dicarbonate (DMDC) to assist in reducing E. coli O157:H7 levels and including milder levels of heat treatments in batch operations that would be economically feasible to cider producers; and 32 locations in Tennessee monitored using real-time PCR assay to detect Asian Soybean Rust six to ten days prior to visible rust lesions on infected plants so that soybean producers could be provided timely notification to begin fungicide applications. Extension education included newsletters, groups meetings, individual assistance, and mass media. Programs were completed with assistance from University researchers and state and federal regulatory personnel.

Impact: 100% of Tennessee counties formulated a plan for agroterrorism prevention. More than 350 soybean producers were informed of Asian soybean rust via Extension workshops concerning the severity of this disease and the proper methods of reporting and identifying the disease. Extension participated in planning and delivery of several emergency response tabletop exercises with scenarios including foreign animal diseases and terrorist attacks on the human food system. These exercises increased federal, state and local agencies' awareness of agricultural emergencies and appropriate multi-agency responses to incidents for which most of the agencies have little experience.

Funding: Smith-Lever; Hatch

Scope: State-specific; Integrated

Goal 2 – A Safe and Secure Food and Fiber System

2.0 Overview

2a. Results

A statewide needs assessment conducted by the Tennessee Agricultural Experiment Station showed that one of the Tennessee Agricultural Research and Extension System's most important services is the "identification of and recommendations for food safety concerns." To achieve this goal, Research and Extension focused on food safety in production, processing and consumption in FY 2005.

2b. Highlights

Programs with statewide impact included: The Expanded Food and Nutrition Education Program (EFNEP), the Tennessee Nutrition and Consumer Education Program (TNCEP), Beef Quality Assurance, and research in food quality, foodborne pathogen protection and food security.

Research continued on improving the overall ability of cows to fight off or prevent infection by identifying genetic markers that can be used in selection strategies and identifying the mechanisms by which these genetic markers contribute to disease susceptibility. Thus far, a series of polymorphisms or variations in a gene that aids in recruiting immune cells to the site of infection has been identified and are associated with mastitis in Holstein dairy cows. Moreover, UT Research has also determined that this same set of markers are linked to impaired functional ability of neutrophils – a type of white blood cell critical to eliminating bacterial infections such as mastitis.

2c. Benefits

The statewide TNCEP outcome indicators and adoption levels are based on a purposeful sample provided by county best practices at three to 12 months. Outcome indicators, planned adoption and adoption levels are shown below:

Statewide Outcome Indicators	*Statewide Contacts (Food Stamp Clients)*	*Number who Plan to Adopt Practice*	*Percent who Plan to Adopt Practice*	*State Total Reported Change*
Wash hands before and after food handling	21,226	19,661	93%	91%
Cook and store foods at a safe temperature	3,231	2,856	88%	88%
Separate raw, cooked, and ready-to-eat foods while storing and preparing	2,960	2,689	91%	91%
Refrigerate perishable food promptly	4,141	3,894	94%	70%

EFNEP collected impact through a national reporting system that aggregated data from the 10 counties that conduct the EFNEP program. Adults enrolled in EFNEP completed pre- and post-24-hour dietary recalls and pre- and post-behavior surveys to measure changes in food-related behaviors. A one-time survey for youth was implemented at the end of the school year. Survey data from adult participants showed that food safety practices improved:

- 32% of 2,592 families reported they no longer left perishable foods at room temperature for more than two hours.
- 59% of 2,595 reported no longer thawing foods on the counter.

Surveys completed by EFNEP youth at the end of the school year indicated that 76% of 8,865 improved practices in food preparation and safety. In addition, teachers observed changes in behavior such as increased hand washing and improved hand washing techniques.

The development of genetic markers will allow selection of dairy sires that produce daughters less susceptible to mastitis and potentially other diseases. Over time this will serve to increase the number of mastitis-resistant animals in the population, thereby increasing dairy cow health and productivity, as well as improve milk quality and reduce the potential development of antibiotic resistant bacteria.

UT Agricultural Research has developed a method for clarifying beverages containing microorganisms and flocculants by using a natural, antimicrobial polysaccharide, chitosan.

2d. Assessment of Accomplishments

The outcomes achieved in Goal Two programs were consistent with the planned programs in the FY 2005-2006 Plan of Work Update. A special accomplishment was the exceptional outcomes achieved by the state's EFNEP and TNCEP programs, targeting limited resource Tennesseans.

2e. Allocations for Goal 2

UT 1862 Research – $3,507,096 • Hatch – $264,356 • Multistate 3(c)3 – $138,026 • Animal Health – $27,559 • State – $3,077155	**FTEs for Goal 2 – 76.3** • UT 1862 Research – 58.5 (9.7 scientist and 48.8 non-scientist) • UT 1862 Extension – 13.5 • TSU 1890 Extension – 4.3 (3.8 professional and 0.5 paraprofessional)
UT 1862 Extension – $1,478,553 • Smith-Lever b and c – $218,568 • Smith-Lever d(EFNEP) – $361,912 • State/County – $898,073	**TSU 1890 Extension – $183,610** • NARETPA Section 1444 and 1445 – $92,799 • Grants and Contracts – $60,457 • State/County – $30,354

2.1 Key Theme: Safe Food Handling

Title: TNCEP Food Safety Improving the Lives of Food Stamp Families

Issue: Tennessee ranks fifth in the country in total households receiving food stamps, and during 2005, the number of Tennesseans receiving food stamps increased 5%. Tennessee families receiving food stamps are at-risk of poor health due to unsafe food handling practices.

What has been done: In 2005, UT Extension delivered food safety instruction as part of its food nutrition education program. The program targets food stamp recipients and families who are eligible to receive food stamps. The program is known as the Tennessee Nutrition and Consumer Education Program (TNCEP). TNCEP programs are evaluated using multiple data collection strategies. The names and phone numbers who participate in the series of educational programs are collected through sign-in sheets. Short, end-of-program questionnaires are used to assess knowledge gained. Participants are asked specific questions related to the adoption of specific practices through interviews or through a show of hands. Impact statements are directly reported by participants or through program partners. The program participants are also given pre and post-tests and skill improvement is directly observed during and after educational programs.

Impact: The statewide TNCEP outcome indicators and adoption levels are based on a purposeful sample provided by county best practices at three to 12 months.

Statewide Outcome Indicators	*Statewide Contacts (Food Stamp Clients)*	*Number who Plan to Adopt Practice*	*Percent who Plan to Adopt Practice*	*State Total Reported Change*
Wash hands before and after food handling	21,226	19,661	93%	91%
Cook and store foods at a safe temperature	3,231	2,856	88%	88%
Separate raw, cooked, and ready-to-eat foods while storing and preparing	2,960	2,689	91%	91%
Refrigerate perishable food promptly	4,141	3,894	94%	70%

In Hamilton County, a post-test only survey administered to 220 teenagers from Dalewood Middle School who received lessons, reflected the following impacts:

- 64% now refrigerate perishable foods promptly.
- 60% now wash their hands before and after handling food.

In Giles County, 5,837 students participated in TNCEP nutrition and food safety lessons. Follow-up reports from 61 public school teachers who taught the lessons revealed that:

- 97% of the youth now wash hands before and after handling food.

- 47% of the youth recognized where to store perishable food items.

The Meigs County effort targeted youth in an effort to encourage hand washing and prevent the spread of germs in the schools. The Germ City Program was presented to 189 Meigs County Kindergarten and Head Start students. A follow-up questionnaire for Meigs County teachers showed that 100% of students wash their hands more times during the day as a result of Germ City. Also, 84% stated they went home and shared what they had learned with friends and family.

In Scott County, 134 Pre-K and Kindergarten students were involved in the hand-washing program. The students conducted a germ search using a black light to determine germs left on their hands after hand-washing. Only 45% of the students had clean hands. Then, the students received the instruction in proper hand-washing. A follow-up at the end of the school year showed that 81% had clean hands. This is a 38% increase. Also, 345 parents were reached in the Scott County program. One parent said, "…my kids remember when they need to wash and now they just don't stick filthy hands in their food. Plus it's a wake up call for me because I know they are watching my every move, especially when I'm cooking."

Funding: Smith-Lever; Tennessee Department of Human Services; USDA Food Stamp Program

Scope of Impact: State-specific

Title: Safe Food for Tennessee – EFNEP

Issue: Tennesseans from low-income households are especially at-risk of poor health due to inadequate food safety practices.

What has been done: UT Extension implemented the nutrition education program, Expanded Food and Nutrition Education Program (EFNEP), targeted to low-income families in 10 Tennessee counties in 2005. The content of educational sessions included food safety.

Impact: EFNEP collected impact through a national reporting system that aggregated data from 10 counties. Adults enrolled in EFNEP completed pre- and post-24-hour dietary recalls and pre- and post-behavior surveys to measure changes in food-related behaviors. A one-time survey for youth was implemented at the end of the school year. Survey data from adult participants showed that food safety practices improved:

- 32% of 2,592 families reported they no longer left perishable foods at room temperature for more than two hours.
- 59% of 2,595 reported no longer thawing foods on the counter.

Surveys completed by EFNEP youth at the end of the school year indicated that 76% of 8865 improved practices in food preparation and safety. In addition, teachers observed changes in behavior such as increased hand washing and improved hand washing techniques.

Funding: Smith-Lever d; Tennessee Department of Human Services Community Block Grant for Cooking Schools

Scope of Impact: State-specific

Title: Food Safety Certification Workshops for Hospitals, Nursing Home and Child Care Workers

Issue: Hospitals, nursing homes and childcare facility food service workers serve some of the most at risk and vulnerable populations in our country. These food service workers require continuing education in the area of food safety so they are aware of current issues and recommended practices.

What has been done: UT Extension conducted Food Safety Certification workshops for 42 food service workers who serve approximately 9000 at-risk individuals.

Impacts: The percentage improvement from a pre-course exam and the post-course exam was 57% (14% correct versus 71% correct on pre-course exam and post-course exam respectively). An expert estimation considers that the training reduced the incidence of food borne illness by one in 1000, then a minimum of nine serious illnesses or deaths were prevented.

Funding: Smith-Lever

Scope of Impact: State-specific

Title: A Multi-Faceted Approach to Improve Food Safety for Childcare Providers

Issue: Infants and children comprise one section of our population at-risk for foodborne illness. This is due to an incomplete development of their immune system at this early age. It results in them being more susceptible to illnesses such as listeriosis, salmonellosis or hemolytic uremic syndrome. Childcare facilities can play a large role in either preventing or spreading foodborne illness.

What has been done: UT Extension trained 249 child care providers across the state in safe food handling.

Impact: Child care providers increased their knowledge score on the post-test only exam by 16% after the food safety training.

Funding: Smith-Lever

Scope of Impact: State-specific

2.2 Key Theme: Food Quality

Title: Improving Milk Quality and Safety

Issue: Mastitis, an inflammation of the mammary gland most commonly caused by bacteria, negatively impacts milk quantity and quality – resulting in estimated losses of $2 billion each year to the dairy industry in the United States. Within Tennessee alone these losses may exceed $18 million. Moreover, the use of antibiotics to prevent or treat mastitis has the potential to contribute to the development of antibiotic resistant bacteria.

What Has Been Done: Research in this lab focuses upon improving the overall ability of cows to fight off or prevent infection by 1) identifying genetic markers that can be used in selection strategies to improve the overall health of future dairy cows and 2) identifying the mechanisms by which these genetic markers contribute to disease susceptibility so that novel preventive or therapeutic measures can be developed in the future. Thus far, a series of polymorphisms or variations in a gene that aids in recruiting immune cells to the site of infection has been identified and are associated with mastitis in Holstein dairy cows. Moreover, we have also determined that this same set of markers are linked to impaired functional ability of neutrophils – a type of white blood cell critical to eliminating bacterial infections such as mastitis.

Impact: Development of genetic markers will allow selection of sires that produce daughters less susceptible to mastitis and potentially other diseases. Over time this will serve to increase the number of mastitis resistant animals in the population, thereby increasing dairy cow health and productivity, as well as improve milk quality and reduce the potential development of antibiotic resistant bacteria. These markers also could be utilized within the heifer grower industry to add value to heifers with a more resistant genetic background. Perhaps more importantly, these genetic markers also can be used to identify mechanisms that contribute to disease susceptibility so that novel preventive and therapeutic strategies can be developed to minimize the impact of disease on *all* animals – not just those with a specific genetic background.

Funding: Hatch; UT Food Safety Center of Excellence, UT College of Veterinary Medicine Center of Excellence

Scope of Impact: State-specific

2.3 Key Theme: Foodborne Pathogen Protection

Title: Ecology, Inactivation and Control of Foodborne Pathogens

Issue: Outbreaks of foodborne illness caused by *Escherichia coli* O157:H7, *Salmonella*, and *Cryptosporidium* have been associated with consumption of contaminated apple cider and juice. Concerns over the safety of unpasteurized juices has led to FDA regulations that require processing methods that provide a minimum 5-log reduction in pathogens "pertinent" to the

juice. Some juice producers have adopted pasteurization as a means of accomplishing a minimum 5-log reduction in pathogens. However, many producers, particularly small operations, are unable to utilize pasteurization for economic and other reasons or are opposed to pasteurization because of perceived adverse effects on product quality and acceptability.

What has been done: Elevated temperature storage and dimethyl dicarbonate (DMDC) were evaluated for reducing *E. coli* O157:H7 and natural microflora populations in unpasteurized apple cider. DMDC is permitted for use in apple cider under conditions restricted by the Food and Drug Administration. The chemical is commercially available, inexpensive, and its application in cider is not complicated. As such, use of DMDC by cider producers is not prohibitive, regardless of the size of their operations. More important, application of mild heat treatments (e.g., 45 to 55 C [113 to 131 F]) is easily attainable in batch operations and does not require expensive equipment for its application.

Impact: The holding time at these temperatures is relatively short and does not produce noticeably visible adverse effects on cider. Furthermore, holding cider at these temperatures does provide a minimum 5-log reduction in E. coli O157:H7 populations in cider, without added preservatives such as DMDC. This treatment, if deemed an acceptable process by the Food and Drug Administration, will provide cider producers with a simple and inexpensive alternate to pasteurization while also resulting in cider that is safe for consumption and complies with federal regulations.

Funding: Hatch

Scope of Impact: National

2.4 Key Theme: Food Security

Title: Tennessee Pork Quality Assurance

Issue: Producers and consumers alike demand that the food supply available to the public be safe and free of residues that could produce health problems for the population. Food safety is a concern at all levels of the food production process. Food safety starts on the farm but also includes transportation, processing, marketing and cooking the products in homes, restaurants and the food service industry. The producer's role in food safety starts on the farm and can continue through the transportation sector. Tennessee's Pork Quality Assurance program allows its pork producers to participate in a national program of pre-harvest food safety to help insure the safety and quality of the pork produced in the state.

What has been done: Educational materials were developed to educate the producer on the production practices needed to help insure the safety of pork at the farm level. The program has conducted meetings across the state to certify producers in the program. UT Extension has a

state swine specialist who serves on the national committee of Pork Educators at the National Pork Board to help develop the national PQA program for producers.

Impact: All Tennessee Pork Producers that sell hogs to participating plants are enrolled in the PQA program. Since the inception of the program in Tennessee 223 producers have qualified at level III (highest level) of the program. In the past five years, there have been no reported drug residues found in hogs marketed by Tennessee producers enrolled in the PQA program. This means safer, higher quality food for the American public.

100% of 4-H and FFA youth enrolled in the Tennessee market hog project have been certified in the National Youth PQA program for the past 3 years. Youth participants have increased from 107 youth in 2003 to 140 in 2005 (23% increase). During this period of time there have been no reported residue violations in any of the hogs marketed by students that have been through Tennessee's Youth PQA Program.

Funding: Smith-Lever; National Pork Board

Scope of Impact: National

Goal 3 – A Healthy and Well-Nourished Population

3.0 Overview

3a. Results

In FY 2005, Research and Extension programs helped Tennesseans benefit from healthy lifestyles, including better nutrition, diet, and self-care practices. Extension made 570,760 contacts in Goal Three programs, and nearly 24% of these contacts were made with individuals representing racial/ethnic minority groups.

3b. Highlights

In 2005, the Expanded Food and Nutrition Education Program (EFNEP) was conducted in 10 Tennessee counties. UT Extension supported 92 county-based Tennessee Nutrition and Consumer Education Program (TNCEP) coalitions composed of over 1,400 local citizens representing 237 local and state government agencies, community organizations, businesses, Extension faculty and more than 110 food stamp recipients.

In Dyer County, the local National Guard Unit was activated and stationed in Kuwait, and the soldiers took Walk Across Tennessee with them! Five teams were formed at Camp Airfjan located in Kuwait. Soldiers in Kuwait who participated noted the program significantly increased their ability to pass the required army physical fitness test, reduced their stress and improved moral. The program success received recognition in the Army newsletter.

Prior to 2004, the Tennessee Poison Center in Nashville served 58 counties. With the Southern Poison Center closing in Memphis, the Nashville Center became the sole provider of poison prevention for 95 counties and over 5 million Tennesseans. Through a partnership with UT Extension, the Tennessee Poison Center increased the number of programs in 2005 from 401 to 1,003. Program attendance grew from 35,687 in 30 counties to 448,845 in all 95 counties, and involved 4-H youth, Family and Community Education members, child-care providers, and other audiences. In 2005, poison prevention literature distributed to Tennessee households increased from 112,817 the previous year to 642,084.

3c. Benefits

TSU Extension facilitated workshops on MyPyramid, Fast Food - Snack Food, Healthy Heart, Food Safety, and Water: the Important Nutrient. Results indicated 462 participants (100%) gained an understanding of the new food guidance system and planned to apply the knowledge to their daily life. In the Fast Food-Snack Food course, 138 participants (100%) agreed that they would share the information.

UT Agricultural Research has demonstrated a dietary impact on eye health from consuming high lutein supplements and vegetable crops enhanced with high levels of lutein carotenoids.

Adults enrolled in EFNEP completed pre- and post-24-hour dietary recalls and pre- and post-behavior surveys to measure changes in food-related behaviors. Survey data from adult participants showed that 89% of 2,623 families who completed the series of lessons improved their diets resulting in increases in dietary fiber, iron, vitamin C, vitamin A, and vitamin B6, while decreasing the number of calories they consumed from fat. At the same time, they reduced the amount of money they spent on food and 46% of the 2,592 families reported running out of food less often. The statewide TNCEP outcome indicators and adoption levels are based on a purposeful sample provided by county best practices at three to 12 months. Outcome indicator data for dietary quality included the following:

Outcome Indicators	*Statewide Contacts (Food Stamp Clients)*	*Number who Plan to Adopt Practice*	*Percent who Plan to Adopt Practice*	*State Total Reported Change*
Select a diet based on the Food Guide Pyramid	94,345	83,086	88%	65%
Eat 5 or more servings of fruits and vegetables	94,715	83,160	88%	60%
Eat more whole grains	38,669	31,827	82%	60%
Eat fewer high-fat foods	50,995	42,679	84%	61%

In 84 of Tennessee 95 counties, the Tennessee Poison Center increased calls, and today, only six poison control centers in the nation report more calls.

3d. Assessment of Accomplishments

Collaborations were exemplary in all Goal Three programs and activities. Partnerships with 95 County TNCEP Coalitions, County Health Councils, Vanderbilt University, and other organizations resulted in efficient use of resources and reached Tennesseans with human nutrition and health programs.

3e. Allocations for Goal 3

UT 1862 Research – $544,049 • Hatch – $163,073 • State – $380,976	**FTEs for Goal 3 – 92.6** • UT 1862 Research – 13.1 (2.2 scientist and 10.9 non-scientist) • UT 1862 Extension – 70.2 • TSU 1890 Extension – 9.3 (7.6 professional and 1.7 para-professional)
UT 1862 Extension – $7,325,497 • Smith-Lever b and c – $1,131,873 • Smith-Lever d – $1,542,889 • State/County – $4,650,735	**TSU 1890 Extension – $303,546** • NARETPA Section 1444 and 1445 – $199,991 • Grants/Contracts – $60,457 • State/County – $43,098

3.1 Key Theme: Human Nutrition

Title: Tennessee Shapes Up

Issue: Tennessee has one of the highest rates of obesity in the nation.

What has been done: The Tennessee Shapes Up program is UT Extension's response to the obesity epidemic. The ***Tennessee Shapes Up*** program is an eight-week series of educational programs conducted in collaboration with program partners. The program partners include, but are not limited to, county health councils, local schools, local industry, and community centers. The program is designed for classes to meet two times each week with educational classes conducted once each week along with a group walking activity and the second meeting devoted to the group walking activity. In Henderson County, Tennessee, this series of lessons was repeated at four different locations in the county and two other locations are planned for early 2006. This program met two times each week for eight weeks (16 sessions/average attendance = 52). Program focus is healthy eating and physical activity. Data showed weight loss, improved blood pressure, lower cholesterol and triglycerides.

Impact: Outcome data is gathered by pre and post assessments for weight, blood pressure, cholesterol and triglycerides. Behavior change is measured through a self-reported behavior checklist. Weight loss was 639 pounds. The 258 total participants registered in the 4 different program sites reported walking 19,253 miles (not all participants kept a log of miles). Findings from a six month follow-up survey included:

- 64% of participants reported they were still walking two or three times each week.
- 64% said they were still losing or maintaining weight.
- 82% reported their blood pressure has remained at the lower rate.
- 100% reported they were trying to practice what they learned in the nutrition classes.
- 100% said they would recommend the program to their friends.

Analysis of the pre and post behavior checklist survey using SPSS statistical software showed significant change ($p \leq .001$) for reduction of sweetened beverages, eating more fruits and vegetables, identifying and eliminating excess calories, eating breakfast, recognizing non-hunger signals to eat; and eating more meals together as a family.

Funding: Smith-Lever

Scope of Impact: State-specific

Title: TSU Nutrition and Wellness Education Program

Issue: Americans have access to one of the world's most nutritious and plentiful food supplies. But Americans are consuming anything but a well-balanced diet. Health and nutrition experts have generally agreed that consumers can reduce the risk of chronic diseases such as heart

disease, stroke, and some types of cancer, diabetes and depression by monitoring the intakes of foods and by maintaining a healthy lifestyle including regular exercise. Together, overweight and obesity are responsible for at least 300,000 deaths each year.

What has been done: Many individuals, in particular those from limited-resource environments may not have the tools to acquire community and personal nutrition resources that would give confidence to make healthy lifestyle choices. So, to facilitate the community and personal action, the TSU Nutrition, Health and Food Safety Specialist offered assorted workshops to organizations, groups and individuals that demonstrated an interest in nutrition education related to their current lifestyles. In addition, general nutrition education sessions, workshops and materials were restructured according to the USDA and DHHS 2005 updates to the Dietary Guidelines for Americans and the Food Guidance System. The specialist hosts a weekly nutrition and health radio program on WNSG 880 am that is heard in seven Middle Tennessee counties with approximately 40,000 listeners.

Impact: TSU facilitated interactive and informative educational workshops on MyPyramid, Fast Food - Snack Food, Healthy Heart, Food Safety, and Water: the Important Nutrient to over 1,100 limited resource participants. Many participants provided verbal and written comments on the programs delivered.

- MyPyramid (462 presentation attendees):
    - 100% gained understanding of the new food guidance system and indicated that the information would be easy to apply in daily life.
- Fast Food, Snack Food (138 workshop attendees):
    - 100% agreed the information would be shared.
- Healthy Heart (326 workshop attendees):
    - 99% agreed that their received useful tips and information.
    - 93% of the attendees indicated that the tips impacted their daily lives.
- Food Safety (65 lesson attendees):
    - 100% increased their knowledge on effective hand washing.
    - 89% learned that cross contamination is everywhere.
    - 75% indicated the thermometer would be useful in the kitchen.
- Water - the Important Nutrient (125 lesson attendees):
    - 100% gained knowledge on the importance of water in their lives and ways to ensure adequate hydration.
- Etiquette (155 workshop attendees):
    - 100% demonstrated an increase in knowledge and skills regarding conduct, manners and etiquette.

Funding: NARETPA Section 1444 and 1445

Scope of Impact: State-specific

Title: Tennessee Expanded Food and Nutrition Education Program (EFNEP)

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: UT Extension implemented the nutrition education program, Expanded Food and Nutrition Education Program (EFNEP), targeted to low-income families in 10 Tennessee counties in 2005. Approximately 40 nutrition educators supervised by county Extension Family and Consumer Sciences faculty delivered an average of 10 educational sessions to 4,442 families and an average of six educational sessions to 12,225 youth. Families were reached through local agencies such as the Department of Human Services and the Department of Health, while youth received education through school enrichment programs. The content of educational sessions included how to choose and prepare healthy meals and snacks and managing food resources wisely. Much of the education for adults was delivered through food demonstrations, or cooking schools, where participants learned to prepare healthy meals and snacks using low cost foods.

Impact: EFNEP collected impact through a national reporting system that aggregated data from 10 counties. Adults enrolled in EFNEP completed pre- and post-24-hour dietary recalls and pre- and post-behavior surveys to measure changes in food-related behaviors. A one-time survey for youth was implemented at the end of the school year.

Survey data from adult participants showed that 89% of 2,623 families who completed the series of lessons improved their diets resulting in increases in dietary fiber, iron, vitamin C, vitamin A, and vitamin B6, while decreasing the number of calories they consumed from fat. At the same time, they reduced the amount of money they spent on food and 46% of the 2,592 families reported running out of food less often. Improvements in skills such as planning meals ahead of time (59% of 2,691 families), comparing prices (50% of 2,598 families), and using a grocery list (55% of 2,590 families) lead to more efficient use of food resources such as food stamps.

Surveys completed by EFNEP youth at the end of the school year indicated that:

- 75% of 8,865 reported eating a variety of foods,
- 77% of 9991 increased their knowledge of the basics of human nutrition, and
- 76% of 9,991 increased their ability to select low-cost, nutritious foods.

In addition, teachers observed changes in behavior such as increased milk and vegetable consumption and a reduction in the number of soft drinks and chips. Children also were observed making healthier food choices in the lunch line such as choosing low-fat milk rather than whole milk and more fruits and vegetables.

Funding: Smith-Lever d; Tennessee Department of Human Services Community Block Grant for Cooking Schools

Scope of Impact: State-specific

Title: 4-H Healthy Lifestyles

Issue: Currently 15% of Tennessee youth are considered overweight. The increase is the result of sedentary lifestyles and poor nutrition intake. Almost 80% of youth fail to eat the minimum recommended servings of fruits and vegetables and 85% do not meet their dairy recommendations. Habits learned at an early age are carried into adulthood. Over 22% of Tennessee adults are obese from reports from the Behavioral Risk Factor Surveillance System.

What has been done: 4-H healthy lifestyle programs were conducted and evaluated for outcomes in 20 Tennessee counties. Programs were delivered through organized 4-H clubs, camps, project groups and school enrichment by Extension 4-H Agents and volunteers. Examples of 4-H healthy lifestyle programming in 2005 included:

Breadbaking – 215 Fentress County youth participated in the 4-H Bread Baking Activity. The activity was conducted in school classrooms and culminated with the County Championship where contestants participated in an interview to answer the judges' questions related to the nutrients in foods from the grain group.

Day Camp – Polk County conducted a 4-H community nutrition/healthy lifestyles day camp for 200 fourth grade students. The camp provided physical activities, healthy lunch, classes in 5-A-Day and fruit bingo. A similar program in Sumner County reached 144 youth.

Ethnic Cooking – In Dyer County, 21 youth attended a 4-H ethnic cooking school at the local YMCA.

Impact: 2,660 youth were involved in 20 county 4-H healthy lifestyle programs in which a formal outcome evaluation was conducted. Intact groups of 4-H youth were randomly selected for post-test only questionnaires, and completed questionnaires were obtained from 615 youth, a sample of 23% of the total program participants. The questionnaire was a valid and reliable instrument 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 questionnaire used a five-part

scale ranging from never to always to determine adoption of five healthy lifestyle practices. *Because of their healthy lifestyle experiences,*

- 71% report they are now eating more fruits and vegetables.
- 68% can now correctly classify most foods using the Food Guide Pyramid.
- 59% now make sure to eat three servings from the milk group each day.
- 65% now think about food choices and how they affect personal health.
- 70% now eat foods from all the food groups.

Funding: Smith-Lever

Scope of Impact: State-specific

Title: Phytonutritional Improvement of Tennessee Vegetable Crops

Issue: With the "baby boom" generation approaching retirement age, more Americans than ever are at risk of blindness associated with age-related eye diseases. More than one million Americans over the age of 40 are legally blind, with an additional 2.4 million classified as visually impaired. Both of these numbers have been predicted to double in the next 30 years. The most common cause of blindness and vision impairments in Americans over the age of 60 is age-related macular degeneration (AMD), which now affects over 1.6 million elderly adults. Tennessee ranks just below the national average for the prevalence of vision impairments. Research has shown the presence of a protective pigment in the central macular region of the eye composed mainly of the dietary derived carotenoid lutein. Diets rich in lutein from fruit and vegetables are associated with a decreased risk of major eye diseases, such as cataract and age-related macular degeneration (AMD). Increasing the consumption of lutein-rich fruits and vegetables can delay the onset of age-related eye diseases. Enhancement of fruit and vegetable crops with lutein carotenoids would be beneficial for consumers.

What has been done: 50 volunteers were randomly assigned to one of five treatments in a 12-week intervention: (1) placebo pill consumed every day; (2) 10mg of lutein supplement consumed five days per week; (3) 30mg of lutein supplement consumed every day; (4) ½ cup of low-lutein spinach consumed 5 days per week; or (5) ½ cup of high-lutein spinach consumed 5 days per week. At baseline, and after four-weeks, eight-weeks and twelve weeks of intervention, the participants visited the lab to donate a small sample of blood for carotenoid and lipid analyses. At each visit, a vision test was also performed to measure retinal lutein concentrations. All volunteers have now completed the intervention. Data analyses of serum carotenoid concentrations, serum lipid profiles, and MPOD have been complete for all volunteers in the study. Research results have been presented at regional, national, and international meetings. In addition, education was provided to stakeholder audiences in both New Hampshire and Tennessee.

Impact: First, the research demonstrates novel information on both environmental and genetic factors that can influence the concentration of nutritionally important carotenoid pigments in vegetable crops. To date, research has demonstrated a dietary impact on eye health from consuming high lutein supplements and vegetable crops enhanced with high levels of lutein carotenoids.

Funding: Hatch

Scope of Impact: Multistate (New Hampshire)

Title: TNCEP Improves the Lives of Food Stamp Families

Issue: Tennessee ranks 5th in the country in total households receiving food stamps, and during 2005, the number of Tennesseans receiving food stamps increased 5%. Tennessee families receiving food stamps report a lack of knowledge in cooking, food purchasing, managing food dollars, and identifying alternatives to purchasing fast-food and pre-prepared foods.

What has been done: In 2005, UT Extension delivered nutrition education to food stamp recipients and families who are eligible to receive food stamps to increase the likelihood that food stamp recipients will make healthy food choices. The program is known as the Tennessee Nutrition and Consumer Education Program (TNCEP). TNCEP is planned, developed and taught through the work of 92 county-based nutrition education coalitions supported by UT Extension agents and specialists. Over 1,400 coalition members are involved. They represent 237 local and state government agencies and officials, educators, community organizations, businesses, and more than 110 food stamp recipients. In 2005, over 8,000 TNCEP teaching sessions (group meetings) were conducted.

Impact: The statewide TNCEP outcome indicators and adoption levels are based on a purposeful sample provided by county best practices at three to 12 months.

Outcome Indicators	*Statewide Contacts (Food Stamp Clients)*	*Number who Plan to Adopt Practice*	*Percent who Plan to Adopt Practice*	*State Total Reported Change*
Select a diet based on the Food Guide Pyramid	94,345	83,086	88%	65%
Eat 5 or more servings of fruits and vegetables	94,715	83,160	88%	60%
Eat more whole grains	38,669	31,827	82%	60%
Eat 2-3 servings per day of dairy products	44,896	38,957	87%	79%
Eat fewer high-fat foods	50,995	42,679	84%	61%

Outcome Indicators	*Statewide Contacts (Food Stamp Clients)*	*Number who Plan to Adopt Practice*	*Percent who Plan to Adopt Practice*	*State Total Reported Change*
Eat fewer high-sodium foods	26,283	23,270	89%	53%
Eat fewer high-sugar foods	41,849	35,413	85%	61%
Improve food prep skills	31,404	28,512	91%	47%
Maintain a healthy weight	34,769	29,925	86%	59%
Reduce risk factors for diet-related diseases such as diabetes, cancer, high blood pressure, and osteoporosis	25,259	22,842	90%	27%
Increase physical activity	43,603	39,030	90%	55%
Plan meals and select foods to run out of food less often	2,315	1,960	85%	81%
Read food labels to help select the most nutritious food	2,548	2,392	94%	63%
Use a shopping list	2,522	2,192	87%	100%
Compare prices to get the best buy	3,074	2,642	86%	64%
Plan meals ahead of time	3,074	1,367	44%	68%
Manage family resources to ensure adequate provision for food	2,298	1,871	81%	87%

Funding: Smith-Lever; Tennessee Department of Human Services; USDA Food Stamp Program

Scope of Impact: State-specific

3.2 Key Theme: Health Care

Title: Be Poison Safe Tennessee!

Issue: Research reveals that Poison Control Centers across the United States are an underutilized resource for rural communities. Studies have shown that increased use of these Centers by the public avoids the negative outcomes of poisonings, including death and disability. With every dollar spent on using the Poison Control Center, seven dollars are saved in health care costs. 92% of poisoning occurs in the home with the 52% of those being children under six. Poisoning is a major cause of death for this age group. The need for health education and preventive care is essential to alerting the public on how to poison proof their home and other environments as well as to identify poison events that occur and appropriate treatment responses.

What has been done: UT Extension promoted the Poison Control Center and the phone number: 1-800-222-1222. Extension Agents used mass media with poison prevention news articles, radio spots, public exhibits, phone number stickers, magnets, pamphlets, poison safety home audits and posters. UT Extension presented "Make Your Childcare Center Poison Safe" to Head Start teachers. Other target audiences for this program were Family and Community Education (FCE) members, pre-school parents, 4-H youth and 4-H volunteers.

Prior to 2004, the Tennessee Poison Center in Nashville served 58 counties. With the Southern Poison Center closing in Memphis, the Nashville Center became the sole provider of poison prevention for 95 counties and over 5 million Tennesseans. Through a partnership with UT Extension, the Tennessee Poison Center increased the number of programs in 2005 from 401 to 1,003. Program attendance grew from 35,687 in 30 counties to 448,845 in all 95 counties. Poison prevention literature distributed to Tennessee households increased from 112,817 to 642,084.

Impact: In 84 of Tennessee's 95 counties, the Tennessee Poison Center increased calls, and today, only six poison control centers in the nation are busier. Dr. Donna Seger, MD, Executive Director of the Tennessee Poison Center wrote, "This success would not have been possible with the continued support of Vanderbilt University and the dedication of the Extension Educators who help educate Tennesseans about the dangers of accidental poisonings." The Tennessee Poison Center received one of three 2005 Frist Foundation Awards of Achievement for Team-Building. (This award is one of the most prestigious honors that can be bestowed on a non-profit group in Tennessee.) Outcomes reported from county programs include:

Over 80 Bledsoe County parents and Head Start teachers achieved the following outcomes:
- 80% increased knowledge about poisonings.
- 92% could describe the role of the Poison Control Center.
- 94% plan to call the Poison control Center for questions about poisonings or if a poisoning is suspected.
- 70% plan to conduct a poison safety audit of their home.
- 78% plan to post the Poison Control Center's phone number by all the phones in the house and in the phone book of their cell phone.

In a follow-up interview of four Head Start teachers, the following impacts were found:
- 80% could define what a poison was.
- 100% could explain the role of the Poison Control Center.
- 100% had posted the phone number for the Poison Control Center in their class.
- 100% shared information with parents about poison safety for children in the home.
- 100% identified four poisonous products in their childcare center and stored them properly (if they were not already doing so).
- 100% plan to call the Poison Control Center if they need information on poisons or suspect a poisoning.

- 80% identified three ways to keep poisonous products safely away from children and use those methods in their centers to store poisons.

In Houston County, 19 child care providers created a poison control plan as a result of this program. More than 600 Macon County 4-H youth were involved in multi-session poison control programs; and 75%, by a show of hands, will not store products in the container of another product. Also 75% indicated they planned to keep original labels on all products.

Funding: Smith-Lever

Scope of Impact: State-specific

Title: Walk Across Tennessee Reaches Kuwait in 2005

Issue: Tennessee ranks 46th overall in health, and 61% of adults in the nation are overweight or obese. Due to the epidemic of overweight, life expectancies will soon be shortened in areas where obese rates are high, according to the International Society for the Study of Obesity. Heart disease is one of the problems associated with poor diet and lack of exercise and can occur at any socio-economic level. Regular physical activity helps reduce a person's risk of having a heart attack and stroke.

What has been done: UT Extension implemented the Walk Across Tennessee program to involve communities in taking charge of individual health. UT Extension organizes community coalitions to recruit teams for the eight-week fitness program. The program materials, group meetings, news articles, research-based information, radio and other media were used to motivate participants to walk the distance of the state.

Impact: Walk Across Tennessee was organized in 21 counties with 2,158 participants. The participants logged 198,176 miles, or an average of 92 miles per participant.

In Benton County, 40 walkers had the following impacts as measured by an end-of-program questionnaire:
- 75% will continue to walk after the 8 week program.
- 61% increased the amount of physical activity as a result of what they learned.
- One Benton County walker stated that she lost 10 pounds in the eight weeks.

In Coffee County, the 8-week evaluation of 60 participants revealed that:
- 100% increased types (walking, biking, hiking and jogging) of weekly physical fitness activities from two to three.
- 100% increased the number of times each week they participant in physical fitness activities from six to ten.
- 100% are exercising an average of 59 minutes more each day.

- 100% reported one or more personal benefits of the program; increased exercise, motivated self, friends and family, decreased TV time and/or reduced stress level.
- 47% reported improved eating habits.

Overton County 4-H involved 64 students in Walk Across Tennessee. Teachers reported that students became more motivated during the program; improved their attention span during class; improved their grades; reduced discipline problems; and created social bonding for students.

In Dyer County, the local National Guard Unit was activated and stationed in Kuwait, and the soldiers took Walk Across Tennessee with them! Camp Airfjan located in Kuwait was home to five Walk Across Tennessee teams. Soldiers who participated noted the program significantly increased their ability to pass the required Army physical fitness test, reduced their stress and improved moral. The program success received recognition in the Army newsletter.

Funding: Smith-Lever

Scope of Impact: State-specific

Title: Improving Latino Accessibility to Health Care

Issue: Tennessee ranks 4th in the nation in Latino immigrant population growth. According to the 2000 U.S. Census, Coffee County's Latino population is the fastest growing minority group with a 305% increase. However, community representatives believe census data is inaccurate and actual numbers are much higher than reported.

Through Latino focus groups, the Tennessee Latino Health Coalition serving Bedford and Coffee Counties identified language as the single most critical barrier to health care. Few health care professionals speak Spanish and immigrants speak limited English.

What Has Been Done: UT Extension assisted in conducting 11 Latino health coalition planning meetings to offer Spanish language training for health care professionals, Spanish health care directories and update the coalition website. Program partners included Kentucky State University, University of Kentucky, 10 state government or community organizations, and Latino community representatives. UT Extension conducted a forum for health care providers with the Tennessee Commissioner of Health was held at Motlow Community College.

UT Extension coordinated and promoted a Spanish Survival language and culture training for health care providers through four news articles published in three newspapers, development and distribution of 400 brochures, a radio spot for five radio stations and advertisement for two cable stations. A cultural reality workshop was conducted for 36 health care providers to build empathy for Latinos and develop an awareness of the Latino culture. The UT Extension Agent raised more than $15,000 for adult education, including English language learners.

UT Extension surveyed 15 Latino parents to identify needs and conducted a heart health education program.

Impact: Of the 35 health care providers in cultural reality courses:
- 97% developed an understanding of accessing health care services in a foreign country.
- 97% increased empathy for Latino immigrants seeking services.
- 100% identified obstacles immigrants face in accessing health care.
- 100% stated they would make additional changes in the way they relate to Latino immigrants.
- 100% plan to learn more Spanish.
- 100% would recommend the cultural reality course to others.

1,000 Coffee and Bedford County Latino families received Spanish language health care directories. In addition, the following outcomes were noteworthy:
- 57 Latino adults enrolled in "Easy English" language classes.
- 109 Latino adults completed the requirements for a GED.
- 52 Latino adults were awarded vouchers though the literacy council GED incentive program, and one Latino student was recognized as the GED top achiever and was awarded a college scholarship.

Funding Source: Smith-Lever; Rural America Grant awarded to Tennessee (Bedford and Coffee Counties) and Kentucky at $539,000 for five years (2002-2006); Literacy Council

Scope of Impact: Multi-state (Kentucky); Multi-institutional (UT, University of Kentucky and Kentucky State University)

Title: Trousdale County Makes Healthy Lifestyle Choices Concerning Meth

Issue: Methamphetamine (meth) is a serious threat that endangers families and communities. In 2004, there were 1,574 meth labs seized in Tennessee, second only to the state of Missouri. The Tennessee Department of Children's Services reported that about 700 children were taken from homes where meth was being manufactured and placed into state custody. Children are the most vulnerable to the devastating long-term effects of meth exposure. A meth explosion in Trousdale County killed two and caught an entire apartment complex on fire, with many residents being dislocated.

What has been done: Extension took an important step in trying to educate young people by partnering with the Trousdale County Middle School Counselor, Sheriff's Department, and District Attorney General to offer a day of education programming about making right choices concerning meth use and consequences. Extension helped to facilitate the showing of a METH = DEATH video that was produced by the 13th Judicial District Drug Task Force.

The students were divided into gender sessions for the entire middle school (321 students) where each group had rotation of classes to discuss the dangers of methamphetamine. One of

the sessions dealt with addiction, family separation, legal consequences, and health dangers. The most influential session (according to 88% of the participants) was a meth addict who was currently serving time in the local jail who came and spoke to the students about how he became addicted to meth and how it had destroyed his family and life.

Impact: Students who were surveyed validated the importance of correct information. Personal questions and confidential issues were given to the Counselor for further investigation.

- 64% of the Middle School Students had some prior knowledge about methamphetamines, but did not know all the real dangers.
- One girl reported she thought meth would help her lose extra body weight, making her more attractive. She had no idea about how addiction would affect her health prior to this program.
- 70% of the students did not know children could be removed from their homes if meth was used and produced.

Funding: Smith-Lever; Tennessee13th Judicial Drug Task Force

Scope of Impact: State-specific

Goal 4 – Greater Harmony Between Agriculture and the Environment

4.0 Overview

4a. Results

Goal Four programs supported broad goals for Research and Extension programs in integrated pest management, land use, agricultural waste management, water quality and natural resources management. Extension contacts numbered 141,999 in various programs working to achieve greater harmony between agriculture and the environment.

4b. Highlights

Research was pursued to reduce the impact of drift from pesticide sprayers. Spray applicators are placed in the precarious position of balancing spray timeliness, drift risk, and rapid execution of the spray job. Boom and nozzle manufacturers requested objective data to assess spray boom bounce and nozzle performance to increase spray capacity with reduced drift risk. UT research targeted reducing drift by examining the under-dosing and over-dosing of applied sprays.

Because high levels of wood waste lead to poor fiber recovery, higher raw material use, higher energy use and unwise use of the precious forest resource, UT Research investigated real-time predictive modeling of the physical properties of wood composites using genetic algorithms and neural networks. A real-time multi-sensor data fusion database was developed to support the modeling system. Validation of the system was performed at modern medium density fiberboard and oriented strand board plants in the United States.

In 2005, 40 school purchasing officers at five locations were trained to understand IPM and aid in their development of pest management bid specifications. The bid specifications were posted in rich text format thus allowing school personnel to download and modify it for their specific school system. Additional educational material was posted to our school IPM web site.

Use of phytoremediation for metal-contaminated soils presents a U.S. market opportunity of close to $1 billion per year, at a cost of only 10-20% of traditional engineering approaches. UT Agricultural Research has demonstrated that a class of plant metal-biding proteins, after being transferred into tobacco and Arabidopsis, is capable of accumulating heavy metals from solution. This research has great potential to develop into a highly efficient and effective phytoremediation strategy to clean up the Nation's heavy metal contamination.

4c. Benefits

The Tennessee Agricultural Experiment Station improved spray nozzle technologies and assessment ratings. These improvements were adopted by 80% of the U.S. sprayer technology manufacturers. The combined effect resulted in a 45% reduction in drift compared to 12 years

ago. Drift reduction savings were 2% of $9 billion annual expenditure for U.S. pesticides, or $180 million of less off-target losses, not including savings in liability and insurance costs and environmental impact. Classification and improved technologies impacted the engineering design of 16 million spray tips sold annually.

Research assisted in the reduction of wood waste during forest products manufacturing. The medium density fiberboard plant used for the validation study was able to reduce wood and resin usage from use of the genetic algorithm system. Annual cost savings from reduced wood and resin use were $700,000 at the test site.

According to phone survey results, the number of Tennessee school systems using IPM rose by 6% during 2005. Also, phone survey results showed that 81% of the school systems that had pest management decision-makers attend our training (and had answered "don't know" for less than 3 questions related to pest management practices used) were using IPM.

The annual week long State 4-H Wildlife Conference was attended by 161 middle school youth and 32 leaders. Average test score comparisons between pre and post tests showed an increase in knowledge of 40% concerning issues related to wildlife ecology and management.

4d. Assessment of Accomplishments

The multistate and multi-institutional partnerships increased the capacity of the Tennessee Agricultural Research and Extension System to leverage resources for problems of statewide and nationwide concern. The National Learning Center for Private Forest and Range Landowners is an exemplary example, involving 37 individuals from 15 universities in each geographic region of the United States. In addition, 1890 and 1862 land-grant institutions were represented.

4e. Allocations for Goal 4

UT 1862 Research – $3,776,350 • Hatch - $482,488 • Multistate 3(c) 3 - $174,537 • McIntire-Stennis - $487,247 • State - $2,632,078	**FTEs for Goal 4 – 118.6** • UT 1862 Research – 87.2 (16.9 scientist and 70.3 non-scientist) • UT 1862 Extension – 25.7 • TSU 1890 Extension – 5.7 (4.4 professional and 1.3 para-professional)
UT 1862 Extension – $2,177,720 • Smith-Lever b and c – $413,719 • Smith-Lever d – $194,729 (IPM and ERRA Renewable Resources) • State/County – $1,699,923	**TSU 1890 Extension – $347,562** • NARETPA Section 1444 and 1445 – $275,729 • Grants/Contracts – $46,709 • State/County – $25,124

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. In 1997, survey results suggested that 11.7% of Tennessee schools were using IPM. During the next five years, training was provided to pest management professionals, school superintendents, teachers, environmental educators, parents and environmental advocates. Based on 2002 survey results, we estimated that about 25% of the school systems are now using IPM.

What has been done: In 2005, 40 school purchasing officers at five locations were trained to understand IPM and aid in their development of pest management bid specifications. The bid specifications were posted in rich text format thus allowing school personnel to download and modify it for their specific school system. Additional educational material was posted to our school IPM web site.

Impact: According to phone survey results, the number of Tennessee school systems using IPM rose by 6% during 2005. Also, phone survey results showed that 81% of the school systems that had pest management decision-makers attend our training (and had answered "don't know" for less than 3 questions related to pest management practices used) were using IPM.

Funding: Smith-Lever; Hatch

Scope of Impact: State-specific; Integrated Research and Extension

Title: Plant Disease and Pest Identification for Tennessee Agriculture

Issue: Destructive insects and plant diseases cause millions of dollars of losses to agricultural and horticultural products and structures each year in Tennessee. It is critical that these pests and diseases be identified in a timely fashion in order to respond to outbreaks and choose appropriate management strategies, in many cases, strategies other than pesticides.

What has been done: The Plant and Pest Diagnostic Center (P&PDC), which is part of the Southern Plant Diagnostic Network, is on the frontline of defense against domestic and exotic insects and diseases that threaten agricultural products in Tennessee. The P&PDC processes samples from all 95 counties from county Extension agents, growers and the general public. In recent years, 1/3 of all samples have been processed digitally for speeding information to the end user.

Impact: Over 3,700 insect and plant disease specimens were identified for clients in 2005. A recent survey of commercial clients of the P&PDC indicated that:

- 83.6% said that the diagnosis was quick enough for their needs
- 78.7% said that they did not know of a source for comparable information
- 68.4% said that the pest or disease was controlled because of the P&PDC information
- 41.7% controlled the pest without the use of pesticides
- 68.4% said that the environment stayed safe when pesticides were used.
- One in three respondents felt information from the P&PDC saved them money; estimates of the amount saved ranged from $200 to $10,000, with a mean of $3,300 and a median of $800.

Funding: Smith-Lever

Scope of Impact: State-specific

Title: Reducing Drift Risk

Issue: Spray applicators manage the risks of spray drift and pest control with ever-changing technologies. Sprayer manufacturers, applicators, and producers feel increased pressure to spray with equipment that is faster, wider, and produces large droplets. These conditions increase boom acceleration and motion. Net result is increased spray variation with fewer droplets for spray coverage and contact with pests. Unsteady boom movement limits precision agriculture grid-size in an era of sub-meter global positioning. Spray applicators are placed in the precarious position of balancing spray timeliness, drift risk, and rapid execution of the spray job. Boom and nozzle manufacturers requested objective data to assess spray boom bounce and nozzle performance to increase spray capacity with reduced drift risk.

What has been done: A field sprayer 27-m boom was custom instrumented to measure inadvertent movement and acceleration that causes under-dosing and over-dosing of applied sprays. The system monitored instantaneous heights of boom ends, 3-dimension accelerations along the boom, and sprayer position along a field test track. A sprayer on-board computer monitored sensors 2500 times a second. Simultaneous spray deposit was collected using grids of cards placed in the field. These tests were compared with 15,000 spray atomization factors and 240 deposition and drift factors amassed over 12 years. Additional nozzles were assessed a nozzle classification (ASAE S572) developed in-house and used by all U.S. pesticide manufacturers to meet product EPA label requirements. Fore-aft boom tip movements (0.5 m) double and triple over-dosing and corresponding under-dosing. Up-down boom movements (0.5 m) affect nozzle pattern overlap and more importantly double and triple drift when applied upwind and adjacent to sensitive areas.

Impact: Sprayer boom manufacturers redesigned boom supports to improve boom designs for faster (32 km/h) and wider (37-m) sprayers. Sprayer industry includes spray boom sales of $40 million (annual), and $325 million of sprayer unit sales including 4,250 new self propelled units

annually. Improved spray nozzle technologies and assessment ratings were adopted by 80% of the U.S. sprayer technology manufacturers. The combined effect resulted in a 45% reduction in drift compared to 12 years ago. Drift reduction savings were 2% of $9 billion annual expenditure for U.S. pesticides, or $180 million of less off-target losses, not including savings in liability and insurance costs and environmental impact. Classification and improved technologies impacted the engineering design of 16 million spray tips sold annually. The American Society of Agricultural and Biological Engineers recognized the developed system with a "2005 Superior Paper Award" for the article "Sprayer boom dynamic effects on application uniformity – Transactions of the ASAE 47(3):647-658." The U.S. EPA initiated a "Drift Reduction Technology" program based on field data to test and verify drift reduction technologies.

Funding: Hatch; Corporate/Company Grants; State Crop Commodity Grants

Scope of Impact: National

4.2 Key Theme: Land Use

Title: National Implementation of Soil Erosion Management Tool

Issue: Soil erosion rates from unprotected agricultural, construction, mining, and disturbed forest sites can reach levels as high as 200 tons per acre each year, or the equivalent of 10 dump trucks of soil being removed from each acre. We have management schemes to reduce these to acceptable rates of erosion, but to select the best option land managers need to be able to quickly and easily compare alternatives.

What has been done: Working with researchers and field personnel from the USDA Office of Surface Mining, Wisconsin Department of Natural Resources and others, UT researchers have developed the RUSLE2 soil erosion prediction technology, a computer program that allows managers, consultants, or USDA Natural Resource Conservation Service (NRCS) field office personnel to easily and quickly compare a wide variety of management alternatives for their specific situation. The program in its simplest forms requires only selection of location, soil type, management scheme, and entry of the slope length and steepness to immediately provide erosion results. More knowledgeable users can examine alternatives in much greater depth, and can view more detailed results. In addition to its use in more than 2500 NRCS field offices across the U.S., the tool is used by hundreds of other practitioners.

Impact: According to estimates by NRCS managers, the RUSLE2 program is being used an average of between 10-15,000 times each day by NRCS personnel. This program and its earlier versions have been used in implementation of the federal Conservation Compliance, Conservation Reserve, and Conservation Security Programs. Nationwide these have led to an estimated 40% reduction in soil erosion on roughly 50 million acres of highly erodible land, resulting in an overall soil savings over 15 years of 1.2 billion tons, or enough to cover the entire land area of Tennessee with soil over ¼ inch deep.

Funding: Hatch; USDA-ARS and USDA-NRCS Cooperative Agreement

Scope of Impact: Multistate (Wisconsin); National

4.3 Key Theme: Water Quality/Animal Waste Management

Title: Forest*A*Syst Phase II

Issue: Silvicultural operations contribute a small but calculable amount of sedimentation into Tennessee's waters. A program was considered necessary to reach forest landowners and educate them about forestry best management practices (BMPs) in order to reduce this source of nonpoint source water pollution.

What has been done: Nine professional programs were presented to 266 landowners who collectively own 94,181 acres of forest land. The accompanying Forest*A*Syst manuals were distributed to the participants for their use in better understanding techniques in minimizing non-point source water pollution.

Impact: The results of the program indicate 99% of the participants are willing to adopt the practices. The landowners estimated the value of the program with regard to dollars earned or saved for their property at $22,061 per landowner. In addition, understanding of non-point water pollution increased 114% (based on a before/after participant survey).

Funding: Smith-Lever; Tennessee Department of Agriculture Non-point Source Pollution Program

Scope of Impact: State-specific

Title: Decentralized Wastewater Management in Tennessee

Issue: Economic prosperity has allowed many families to move from urban locations into rural areas. Counties surrounding the major urban areas have seen a tremendous conversion of farm land into subdivisions and retail establishments. Most of this land conversion takes place in locations that do not have centralized sewer systems. In non-sewered locations, the soil is used to renovate wastewater and return it back ground or surface waters. Since farmland is typically composed of deep soils that can percolate water, developers and builders have a high demand for agricultural lands. Tennessee has significant land resources that are neither suitable for crop production or for onsite septic systems.

What has been done: The UT Center for Decentralized Wastewater Management has developed and conducted a series of workshops that focus on the engineering aspects of

decentralized wastewater treatment and management. These workshops have focused on using packed-bed media filters as a means of providing aerobic treatment of domestic wastewater for subdivisions and/or small communities. These devices remove organic compounds from wastewater, provide nitrification and denitrification, and minimize the formation of a soil-clogging biomat where the treated water is applied to the soil.

Impact: Rutherford, Williamson, Blount, and Washington Counties in Tennessee are accepting decentralized wastewater management technologies as a permanent component of the local wastewater infrastructure.

Funding: Hatch; Tennessee Departments of Agriculture and Environment and Conservation; Tennessee Valley Authority; Tennessee Onsite Wastewater Association; Adenus Wastewater Solutions

Scope of Impact: State-specific

Title: Animal Waste Management Education

Issue: Concentrated animal feeding operations (CAFOs) have been identified as significant sources of water quality problems. CAFOs are required to obtain a state permits and follow environmental regulations. Effectively implementing practices required by the revised state regulations should contribute to protecting and improving water quality. Livestock producers need to understand and comply with CAFO regulations.

What has been done: UT Extension trained 67 agents on environmental regulations and compliance. Additionally, two multi-county producer meetings were conducted; 71 producers and allied industry personnel representing six counties participated. Participants were educated on environmental issues including the revised CAFO regulations, nutrient management planning, conservation plans and cost-sharing opportunities. To support these training efforts, 20 fact sheets were developed to enhance the understanding of CAFO regulations and numerous farm visits were made by specialists and agents. UT Extension specialists spoke at industry and government workshops on the interrelations of agriculture and the environment. The ultimate impact of these educational efforts will be reductions in water quality impairment due to livestock and poultry production. However, time is required to achieve measurable improvements; the program is in its initial stages.

Impacts: Written evaluations of the agent inservice indicated 93% increased their understanding of CAFO regulations: 84% better understood how Extension can help producers comply with regulations: and 87% increased their understanding of nutrient management planning. Evaluations of the multi-county producer meeting indicated 93% of the participants increased their understanding of CAFO regulations, nutrient management, best management practices, and cost-share programs. These gains in awareness and understanding have been evident by requests to specialists and agents for assistance in developing permit application packages, nutrient

management plans and conducting on-farm environmental assessments. Numerous producers are currently preparing applications; many have submitted their applications well before the deadline.

Funding: Smith-Lever; Section 406 integrated water quality program

Scope of Impact: State specific

4.4 Key Theme: Forestry/Natural Resources Management

Title: TSU Targets Tennessee's Soft Wood Timber Production

Issue: The production of soft wood timber in Tennessee has been on a continuous decline while many of the other southern states (since 1983) have been on the increase. One major factor that contributed to this decline was poor stand establishment due to weed pressure and the control of weeds and hardwoods from planting to harvest.

What has been done: From 1991 through 2005, TSU Extension embarked on a statewide program to provide foresters and landowners the most cost-effective weed management education. This was accomplished through hands-on training in the form of field demonstrations, sprayer calibration, pesticide selection and application and classroom training. In support of these programs, a fact sheet on herbacious weed control was written and distributed. A comprehensive bulletin was written to include herbacious weed control, site preparation, pine release and control burning. This publication was then incorporated into the UT Pine Management Guide for Tennessee landowners. This publication is now a part of the required package that is distributed to land owners participating in the USDA Conservation Reserve Program.

Impact: Landowners who have participated in this program has had an increase of 45% tree survival rate. In addition to the survival rate, timberland that laid waste have now been re-established in soft timber. This has led to an increase in forest land to 1.2 million acres among private and commercial landowners in Tennessee. Based on calculations, the education and training provided saved forest landowners $133 per acre. For the 1.2 million acres of pine forest in Tennessee, this is a value to landowners of $159 million. In addition to in increased income, the rotation of timber stand was reduced from 30 years to 20 years.

Funding: NARETPA Section 1444 and 1445

Scope of Impact: State-specific

Title: 4-H Natural Resources and the Environment

Issue: Tennessee is experiencing rapid growth and environmental changes which can dramatically affect the accessibility and quality of its natural resources. Youth need a greater understanding of natural resource and environmental issues.

What has been done: Natural Resources and the Environment is a Tennessee 4-H Priority Program. Opportunities for youth and adults to explore their environment, examine the interconnectedness of human and natural resources, develop outdoor classrooms, apply the knowledge they have gained, improve the environment and address environmental issues have been provided. Educational efforts include school year programs at 4-H Centers, camps and conferences, outdoor learning laboratories, judging teams, service learning projects and classroom programs. A summer camp staff member at each of the four 4-H Centers, provided natural resource and wildlife activities for more than 6,000 Junior and Junior High Campers.

Impact: Youth totaling 8,016 participated in school year environmental education programs at the W. P. Ridley, and Clyde Austin 4-H Centers in 2005. Comments from teachers acknowledge that the programs promote team building and cooperative learning while enhancing formal classroom education in science and related areas, and teaching or reviewing TCAP objectives. Questionnaires from the Ridley 4-H Center participants show that 76% of the youth participants stated they would adopt practices or behaviors learned as a result of participating in the program. Students also indicated they learned more about forest ecology, global connections, and entomology.

In the Camp Explore Environmental Summer Camp 98% of the 48 participants gained a better understanding of ecology and an appreciation of the fragility of the systems on earth which make it suitable for life.

Teacher inservices offered through the Ridley Environmental Education program gave 128 educators an opportunity to enhance their teaching skills related to conservation and environmental education:

- 56% percent of the participants intended to incorporate more experiential education into their classroom instruction as a result of the training.

- 96% of the 56 adults who received training in how to teach environmental education from Clyde Austin Staff rated the information as “useful and meaningful”.

The annual week long Wildlife Conference was attended by 161 Junior High youth and 32 leaders. Average test score comparisons between pre and post tests showed an increase in knowledge of 40% concerning issues related to wildlife ecology and management.

UT Extension Agents conducted county educational programs involving:

- Field days, day camps or earth day festivals in 6 counties involving 3460 elementary youth who showed an average 95% reported increase in knowledge gained in the areas of natural resources, conservation, water quality, safety, and other related areas. A comparison of pre and post test scores in Shelby and Rhea County showed an average knowledge gained increase of 12% in subject matter areas.

- 31 elementary teachers and 705 fourth graders who learned how to plant and take care of trees and gained knowledge about the benefits of protecting natural resources through participation in the ReLeaf Tennessee program. More than 75% of the participants reported correctly planting and caring for a tree.

- A water quality program for 70 fifth grade youth of whom 67% "became more aware of the uses of water" 84% "learned something about the water cycle" 65% "became more aware of conserving water at home" and 81% "learned new facts about water."

- A waste management program for middle school youth where 85% of the participants gained knowledge about human effects on the environment and 55% would encourage adults to recycle paper, plastics and metals.

- In Dickson County, 2700 pounds of phonebooks were recycled by 4-H youth.

In Wildilfe and Forestry judging, 162 youth enhanced their life skills in communication and decision-making while learning and practicing principles related to these two areas. 80% of the participants cited new knowledge in the content areas of these contests and that same number plans to utilize that information in the future.

The FACE (Food and Cover Establishment) for Wildlife Contest involved youth from 57 counties who planted approximately 933 acres in supplemental food resources which improved wildlife habitat on more then 14,895 acres.

Funding: Smith-Lever; environmental education programs at the 4-H Centers are supplemented by grants and gifts including the Tennessee Wildlife Resources Agency with program support from several cooperating agencies and organizations.

Scope of Impact: State-specific

Title: Mitigating Conflicts Between Forest Management, Coal Mining and Wildlife Conservation

Issue: The Cumberland Mountains of Tennessee contain significant wildlife resources and also contain significant coal and timber resources. A significant management challenge is to promote sustainable resource extraction without compromising the native biological diversity that supports the regional environment, outdoor recreation, and quality of life. One indicator of this diversity is the cerulean warbler. Cerulean populations are declining range wide and this species has been petitioned for listing for protection under the Endangered Species Act. Ceruleans in the Cumberland Mountains compose one of the most significant populations throughout its range and may be critical for keeping this species from becoming endangered. The problem land managers face is how to sustain regional cerulean populations so that they are not listed as endangered, but also sustain local economies based on coal and timber extraction.

What has been done: Wildlife researchers with UT Agricultural Experiment Station developed a model for cerulean warblers to accurately predict where ceruleans occur in the Cumberland Mountains.

Impact: Analyses conducted based on this model have documented where land use conflicts between coal mining, timber harvest, human development, and cerulean conservation occur. State, federal, and private land managers in the region have been given the model and have been trained on its use. This predictive model allows public and private land managers to identify ways to mitigate impacts on cerulean warblers while still promoting resource extraction on their lands. Such analyses will ultimately provide the solution to the problem of sustaining wildlife and resource extraction in the Cumberlands.

Funding: Hatch; National Council on Air and Stream Improvement and Plum Creek Timber Company

Title: Reducing Wood Waste During Forest Products Manufacture

Issue: Forest products are a key component of Tennessee's economy. 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 one year, 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 the precious forest resource.

What has been done: The research focus investigated real-time predictive modeling of the physical properties of wood composites using genetic algorithms and neural networks. A real-time multisensor data fusion database was developed to support the modeling system. Validation of the system was performed at modern medium density fiberboard and oriented strand board plants in the United States.

Impact: The medium density fiberboard plant used for the validation study was able to reduce wood and resin usage from use of the genetic algorithm system. Annual cost savings from reduced wood and resin use were $700,000 at the test site.

Funding: Hatch; USDA Small Business Innovative Research Phase I and Special Wood Utilization Grants; Georgia-Pacific Corporation and Langboard, LLC

Scope of Impact: State-specific

Title: Forest Stewardship

Issue: Tennessee forests occupy 55% of the total land base. The majority of this forested land is owned by 470,000 private individuals, many of whom are largely uneducated about research based forest management techniques. Eighty-four percent of Tennessee's annual hardwood removal originates from these private forest ownerships. Programs were needed to gather landowners for natural resource educational purposes.

To encourage better management of forest resources, Congress has provided a number of cost saving opportunities in the IRS code as incentives. It is acknowledged that these incentives are unutilized by qualified taxpayers. For this reason our Forest Stewardship efforts concentrate on improving forest owner knowledge of Timber Taxation.

What has been done: During 2005, three new county forestry associations were added in Tennessee, bringing the statewide total to 43 counties with associations. Natural resource professionals from multiple disciplines delivered educational programs to the 1,551 members. Specifically, one UT Extension specialist delivered 21 programs to 888 landowners who control 133,200 acres of forest land.

In 2005, UT Extension provided regular discussion of Timber Taxation in extension newsletters, produced a publication concerning Conservation Easements, conducted six lectures for County Forestry Associations/Extension meetings and taught tax sessions for 320 attendees. A UT Extension specialist also cooperated with Clemson University to offer the South Carolina Timber Tax program presented via satellite to approximately 150 persons.

Impact: A survey of the association presidents indicates a 59% increase in members who now understand the importance of seeking professional natural resource assistance prior to implementing forestry practices. Landowners indicate an estimated total improvement in income of $11,753 per landowner, for a total statewide impact of $18,229,616. The UT Timber Tax programs improve awareness and increase use of these incentives among the forest-owning community. Filing timber sale proceeds as "long-term capital gains" rather than as ordinary income saves forest owners 5-20% on their taxes owed.

- One forest landowner amended his return, filing his $40,000 timber sale as a long-term capital gain rather than as ordinary income as he had previously. He received a $3,800 refund.
- With estimated timber sale revenues of $275 million, potential tax savings are conservatively estimated at $13.75 million. Our programs modestly help capture $1 million of those savings.
- Participants reported not only saving taxes, but also improving their forest management.

Funding: Smith-Lever

Scope of Impact: Multistate (South Carolina)

Title: Tennessee Master Logger Program (TMLP)

Issue: In Tennessee, there is a great need to implement best management practices in logging operations to protect water quality using a non-regulatory program.

What has been done: During 2005, numerous workshops consisting of 40 hours of instruction per participant were held. 19 continuing education classes of one day each were held. In addition, a research project was initiated and completed to evaluate BMP implementation rates and effectiveness in Tennessee.

Impact: The program graduated 111 loggers (4,440 contact hours of training) impacting an estimated 31,000 acres of forest land consisting of 93 million board feet of timber harvested with a value of $14 million to landowners. The continuing education program had 502 participants and 7,600 contact hours. The program has trained more than 2,000 loggers in the last 10 years.

Implementation of best management practices was surveyed on 215 harvest sites statewide. Results indicate that practices were implemented correctly on 82% of the sites, another 13% did not require practices and 5% were judged to be potential water quality threats. The 82% implementation rate was an improvement from the 1998 survey of 61%.

The estimated value of this program is $1.4 million for the new participants with training. This is estimated by considering that each logger of the 111 loggers works on 280 acres per year. An average acre contains 3,000 board feet, and the average stumpage value of $150 per thousand board feet. The gain of 10% is due to Master Logger Program (111 loggers x 280 acres x 3,000 board feet x 0.15 board feet x 0.10 = $1.4 million).

Funding: Smith-Lever; Hatch; Tennessee Sustainable Forestry Initiative; and Tennessee Department of Agriculture – Forestry Division

Scope of Impact: State-specific; Integrated Research and Extension

Title: National Learning Center for Private Forest and Range Landowners

Issue: The University of Tennessee was selected by the United States Department of Agriculture Cooperative State Research, Education, and Extension Service to develop Forestandrange.org, the National Learning Center for Private Forest and Range Landowners. This National Learning Center will provide a centrally managed and organized Internet resource for nonfederal landowners, managers, and other interested persons to access accurate information concerning the management of natural resources such as wildlife, forest, and range resources. This Internet resource was needed to organize and fill-in existing web-based resources. Internet access to natural resource management information by landowners and managers will allow this Extension program to present information in a cost-effective manner to a large, nationwide audience.

Ultimately, the increased access to educational programs the National Learning Center for Private Forest and Range Landowners will provide will lead to an increased number of forest, wildlife, and management plans, increased use of consulting foresters, biologists, and range scientists on private land, increased adoption of sustainable resource management practices, and an increased general knowledge level in forest, wildlife, and range management.

What has been done: The National Learning Center for Private Forest and Range Landowners is a collaborative outreach effort among 1862 and 1890 land-grant institutions to enhance natural resource information and Extension programming via the worldwide web. Created by USDA CSREES, the Center serves as a comprehensive, interactive natural resource website for landowner education in the United States and provides asynchronous online instruction for target audiences of landowners, managers, and educators.

Impact: UT lead the development of a Content Management System (CMS) to provide module developers with an easy-to-use web development tool and the managers with a tool to manage the large number of web pages associated with modules. With some basic information from the developer, the system will bring each module up to Level 1 compliancy with the Americans with Disabilities Act. The modules currently available are:

Content Module Title	Tennessee's Multistate Partners
Northeast and North Central Forest Owner Planning Module	New York and Wisconsin
The How When and Why of Forest Farming	New York
The Story of the Forest: Forest Connections – A Family Economic Issue	Kentucky
After Wildfire	Montana
Developing a Wildlife Enterprise – Is It For You?	Arkansas
Making Estate Planning More Accessible for Forest Landowners	Indiana and Pennsylvania
Riparian Area and Grazing Management	Montana

Over $260,000 has been granted for content development for funding projects in each region of the United States in both 1862 and 1890 programs.

Funding: Smith-Lever; (In addition, USDA CSREES has provided a fourth year of complete funding for this project.)

Scope of Impact: Multistate (Colorado, New York, Mississippi, Montana, North Dakota, Oregon, Pennsylvania, Indiana, Alaska, Arizona, Arkansas, Georgia, Kentucky, Idaho, Minnesota, Montana, New Hampshire, Wisconsin, Utah, Virginia, Washington and West Virginia)

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

5.0 Overview

5a. Results

Tennessee continues to have among the lowest rankings in child well-being, ranking 43rd out of 50 states in the latest KidsCount Data Book (2005). Indicators on which this ranking is based include infant mortality rate, percent of low birth-weight babies, rate of teen deaths from all causes, child death rates, teen birth rate, percent of teens who are high school dropouts and who have no work, percent of children living in poverty, and children living in single-parent households.

Programs that improved the well-being of children, youth and families included: financial security, community development, workforce preparation, parenting skills, child care, youth in governance, leadership, volunteerism, home environmental quality and home safety. As in FY 2004, Goal Five programs in FY 2005 reached over 1.6 million educational contacts.

5b. Highlights

UT Extension initiated *Tennessee Saves Day* in the Tennessee capitol building. A joint Tennessee House and Senate resolution proclaimed April as Tennessee Saves Month, and 65 counties conducted financial education activities. Every state senator and representative received notice of the activities planned in their legislative districts. Over 130 banks, credit unions and local financial education partners were involved in the local and regional activities. More than 1,600 youth made piggy banks either through local Piggy Bank Pageants or through Spend, Save and Share programs in their classrooms.

In 2005, Extension's Family and Consumer Sciences Agents in 62 of Tennessee's 95 counties offered the four-hour class *Parenting Apart: Effective Co-Parenting,* an information and skills-based program that informs parents about the potential effects of divorce on their children and provides them with strategies for minimizing those effects. Approximately 3,300 participants completed the Extension class in 2005. More than 19,000 persons have completed the classes in the last five years. In FY 2005, stakeholder input was considered and used to rework a portion of the program. The participant booklet *Parenting Apart: Effective Co-Parenting* was revised based on responses to class evaluations and input from the co-parenting workgroup.

UT and TSU Extension involved 4,434 youth involved in 4-H citizenship programs that targeted youth altruism and patriotism outcomes. The FY 2005 implementation of the Tennessee 4-H Life Skills Evaluation System has greatly enhanced capacity to evaluate Extension's youth development programs for research-based outcome indicators.

5c. Benefits

The *Tennessee Saves* program involves 10 local and area campaigns marketing the wealth building messages and conducting motivational workshops. These campaigns target clients for follow-up with wealth building coaches. Over 3,500 youth and adults have enrolled as Tennessee Savers and set savings and/or debt reduction goals. Over 60 local and regional credit unions and banks are partnering with coalitions to provide low or no fee Tennessee Saves savings accounts and providing sponsorship for Tennessee Saves activities.

End-of-class evaluations from 2,807 individuals of the 3,300 who completed the *Parenting Apart: Effective Co-Parenting* classes in 2005 reveal the following:

- 94% agree the classes helped them understand about the impact of divorce on children.
- 92% learned about the importance of working together for their children's best interests.
- 91% learned the value of their children having a meaningful relationship with both parents.
- 90% indicated they planned to work with the other parent for the sake of their children.

Data was collected and expert estimations were made in the parenting classes taught to parents who were court-ordered. A UT Extension Specialist estimates $976,500 annual savings if only 45 persons who completed the classes retained custody of their children (based on one child per parent).

Aggregated data from the Tennessee 4-H Life Skills Evaluation System showed that b*ecause of their 4-H citizenship experiences, over 80%* of youth improved their attitude toward service to others and now think that it is important for citizens to vote in elections.

5d. Assessment of Accomplishments

Follow-up surveys indicate that adult program participants are saving an estimated $48.64 a month, while young people (4th-12th grades) save an average of $32 monthly. At this rate, the total economic impact on Tennessee families exceeds $10 million annually. Tennessee Saves is conducted in 64 Tennessee counties, and reaches over 300,000 youth and adult participants annually.

5e. Allocations for Goal 5

UT 1862 Research – $1,340,456 • Hatch - $251,190 • State - $1,089,266	**FTEs for Goal 5 – 180.2** • UT 1862 Research – 32.8 (5.9 scientist and 26.9 non-Scientist) • UT 1862 Extension – 153.9 • TSU 1890 Extension – 14.9 (12.3 professional and 2.6 para-professional)
UT 1862 Extension–$12,681,860 • Smith-Lever b and c – $2,482,315 • State/County – $10,199,545	**TSU 1890 Extension – $710,805** • NARETPA Section 1444 and 1445 – $409,151 • Grants/Contracts – $242,994 • State/County – $58,660

5.1 Key Theme: Financial Security for Tennesseans

Title: Tennessee Saves

Issue: Because they spend too much and save too little, Tennesseans have a great need to build personal financial security.

What has been done: The Tennessee Saves program, begun by UT Extension in 2001, continued to grow in 2005 with three additional counties – Meigs, Fentress and Sevier – either joining existing regional coalitions or beginning development of their own coalitions. Financial education programs continue to grow across the state. In 2005, UT Extension initiated Tennessee Saves Day in the Tennessee capitol building. A joint Tennessee House and Senate resolution proclaimed April as "Tennessee Saves" month, and 65 counties planned financial education activities. Every state senator and representative received notice of the activities planned in their legislative districts. Over 130 banks, credit unions and local financial education partners were involved in the local and regional activities. More than 1600 youngsters made and decorated piggy banks either through local "Piggy Bank Pageants" or through "Spend, Save and Share" program in their local classrooms. The January through April activities culminated in an exhibit in Legislative Plaza in April. The Tennessee Saves web site, www.tennesseesaves.org, has won national recognition for its tools and resources for educators teaching money management and its support of coalition development. Its resources are used by "Saves" coalitions across the U.S.

Impact: Follow-up surveys indicate that adult program participants are saving an estimated $48.64 a month, while young people (4th-12th grades) save an average of $32.00 a month. At this rate, the total economic impact on Tennessee families exceeds $10 million annually.

- 64 Tennessee counties are conducting Tennessee Saves educational programs reaching over 300,000 youth and adult participants annually.
- 10 local and area Tennessee Saves campaigns are marketing the wealth building messages and conducting motivational workshops and encouraging Tennessee Savers with follow-up wealth building coaches.
- Over 3,500 youth and adults have enrolled as Tennessee Savers and set savings and/or debt reduction goals.
- Over 60 local and regional credit unions and banks are partnering with coalitions to provide low or no fee Tennessee Saves savings accounts and providing sponsorship for Tennessee Saves activities.

Funding: Smith-Lever; Local and Regional Credit Unions

Scope of Impact: State-specific

5.2 Key Theme: Community Development

Title: Homeland Security/Disaster Preparedness

Issue: Disaster can strike quickly and without warning. It can force evacuation from neighborhoods or cause people to be confined to their homes. Basic services, such as gas, electricity, and phones can be cut off. Local officials and relief workers may be on the scene after a disaster but depending on the Scope of Impact of the disaster, it may take time. Families across America are often not prepared for community emergencies. Following the September 11, 2001 tragedy in our country, people of all ages have become more aware of the need for health and safety preparedness. Natural disasters which have stricken the Southern Region (including Hurricanes Katrina and tornadoes in northwest Tennessee) make it imperative to help families and communities decide what plans of action to take in case of emergencies or natural disasters. The American Red Cross states that in times of emergency they advocate that families have a plan, follow their plan, volunteer to help if not affected and give blood.

What has been done: This initiative was introduced at an in-service training for Extension Agents, and the American Red Cross and several other state agencies were instructors. Extension made 156,578 contacts in educational programs in family and community security. Awareness and preparedness are keys to helping educate families and communities on what to do in times of emergencies.

Example program efforts included: Disaster preparedness programs targeted to 4-H youth, emergency plans for child care providers, and county agrosecurity plans.

Impact: In London County, UT Extension assisted 19 child care providers to complete emergency plans based on the recommendations set by the U.S. Department of Homeland Security. Regarding agrosecurity, a County Ag Terrorism Team was formed. The group produced a detailed map of the county's livestock and crop producers for emergency preparedness purposes.

In Henry County, Extension focused on blood donation and disaster kits for the home. Surveys conducted with Henry County Family and Community Education (FCE) members showed that 36 had made Family Disaster Kits, and even more members stated they planned to make them for Christmas gifts for family members. Extension led the marketing and education effort to obtain 1765 pints of blood from the county's donors.

FCE was a target audience for the Fentress County effort which had the impacts from interviews and observation:

- 35 members plan to carry the medical reminder cards.
- 14 members completed the cards and carry them.

- 75 members indicated increasing their knowledge about the availability of the medical reminder card and the importance of carrying them.
- 14 members took the medical reminder cards to family members to complete.
- 20 members indicated gaining knowledge about storing financial documents and other valuables in the case of disaster.

In McNairy County, year-end post-program survey results showed that of the 189 participants in "Securing Your Finances in Case of Disaster" program, 00% increased awareness of financial security in times of disaster. When asked what they had learned, comments from participants included:

- "Disaster can ruin financial security fast."
- "Have a will made."
- "Make a Grab-to-go box for my home."

Class evaluations and follow-up surveys of 30 Davidson County Community Club participants revealed the following:

- 100% increased their knowledge of emergency preparedness.
- 100% plan to develop an emergency preparedness plan and appointed an emergency preparedness coordinator.
- 83% plan to prepare an emergency kit for their home.
- 95% plan to prepare an emergency kit for their auto.
- 93% plan to prepare an emergency phone number list for their home

Funding: Smith-Lever

Scope of Impact: State-specific

Title: Dyer County's Summer Education Program

Issue: During the summer months, children in low income areas do not receive enough food for proper nutrition. According to the Dyersburg Board of Education figures, 803 children (70%) who live in District F which is Bruce, Future City, Southtown and Evansville communities qualify for free or reduce meals. 123 (90%) of children who live in the Monroe, Newbern communities qualifies for free or reduce lunch. In addition to basic nutrition needs, there is no organized recreation program during the day for low income neighborhoods.

What has been done: The TSU Extension Community Resource Development Agent organizes the Summer Education Program. This includes providing training to all personnel and volunteers involved with the program and coordinating involvement with other agencies who partner with Summer Education Program. Food menus and recreational projects are selected with care by TSU professional staff. All schools in Dyersburg City and Dyer County are contacted to inform parents and students when the program begins. News articles, fliers and radio programs are conducted to increase awareness.

21,175 lunches and 9,852 breakfasts were served in 2005. Locations for the summer program have increased to 14 locations this year. Agencies such as YMCA, Dyersburg Parks and Recreation, Dyersburg State Community College, Upward Bound, Dyersburg Housing, Newbern Housing and Dyersburg Police Department partner with the Summer Education Program.

Impact: In 2005, the following impacts were noted:

- The program annually creates more than 60 part-time jobs are created in low-income neighborhoods in Dyer County.
- According to Dyersburg Police Department statistics, during the same time this program was conducted, youth crime declined 70% with decreases in theft, vandalism and assaults.
- Parents and program personnel observed that children are choosing better foods now.
- Program personnel have reported that 80% of children attending the program have learned to respect others on projects assigned to them.

Funding: NARETPA Section 1444 and 1445; Tennessee Department of Human Services

Scope of Impact: State Specific

Title: DeKalb County E-911

Issue: DeKalb County, a rural county in Middle Tennessee, has a population of 17,562. The County's Community Resource Development Committee felt that road signs, an enhanced 911 system, and a new 911 dispatch center would greatly improve the quality of life.

What has been done: UT Extension advised and coordinated concerned citizens, county officials, the United States Postal Service, local phone companies, and emergency service providers to identify, map, and name all existing county roads and establish protocol for naming roads in the future. In addition, a stand alone E-911 system was opened. The new center dispatches for all existing emergency services, as well as all communities in DeKalb County.

Impact: Due to the consolidation of dispatch functions, the immediate savings to the City of Smithville were over $90,000, and the immediate savings to the DeKalb County Government were over $60,000. The county now has road signs for all county roads, and much improved communications between all emergency service providers. The county now has state of the art technology that will serve as a model for other counties in how to manage an E-911 center with stand alone technology at much reduced costs.

Funding: Smith-Lever; State and National Homeland Security grant funds

Scope of Impact: State-specific

5.3 Key Theme: 4-H Workforce Preparation

Title: Tennessee Youth at Work – Achieving Goals and Learning Responsibility

Issue: Numerous needs assessments activities across the state including interviews with key informants, document reviews and advisory groups indicate that Tennessee youth do not have the skills necessary to succeed in the workforce.

What has been done: UT and TSU Extension provided programs 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 in two areas, achieving goals and responsibility. 4-H workforce preparation programs were delivered through organized 4-H clubs, camps, project groups and school enrichment by Extension 4-H Agents and volunteers. Programs were conducted and evaluated in 24 Tennessee counties. Examples of 4-H workforce preparation programming in 2005 included:

State 4-H Roundup – 500 high school youth participated in *Youth At Work: A Generation to Lead the Nation,* a week-long event on the University of Tennessee, Knoxville campus. The event brought youth together with college personnel to explore educational opportunities and careers in their field of interest.

Job Readiness – In Van Buren County, 95 high school students participated in a six-month program on job readiness. Youth learned how to complete a job application and proper interview etiquette.

Wild Over Work – Almost 600 Chester County youth participated in the six-month program called *Wild Over Work* to learn the value of work, to explore work opportunities and to set goals for their job or career.

Impact: 4,639 Tennessee youth were involved programs in which a formal outcome evaluation was conducted of responsibility knowledge, attitudes and skills. Intact groups of 4-H youth were randomly selected for post-test only questionnaires, and completed questionnaires were obtained from 1,544 youth (33% of the total program participants). The questionnaire was a valid and reliable instrument 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 questionnaire used a five-part scale (never, rarely, sometimes, often and always) to determine teamwork behaviors after the program. A typical questionnaire item would be phrased "*Because of my 4-H experiences*, I complete assignments that are given to me." The following impacts represent beginning skills and aspirations considered as foundational skills. Also, the following impacts represent "always" and "often" answers.

- 73% ask for help when they need it.
- 57% are willing to try new things.
- 80% complete assignments given to them.

- 80% keep up with 4-H dates and deadlines.

1,802 Tennessee youth were involved 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, and completed questionnaires were obtained from 527 youth (29% of the total program participants). The Tennessee 4-H Life Skills Evaluation System (described above) was used to obtain the following outcome indicator data. *Because of their 4-H workforce preparation experiences,*

- 70% report that they now work to achieve their goals.
- 69% report that they know where they want to end up and plan how to get there.
- 30% now put their goal in writing.
- 47% now set deadlines to help themselves achieve goals.
- 54% now break their goal down in steps so that they can check their progress.

In Marshall County, a workforce program targeting 99 youth had the following impact:

- 54% indicated that the program helped them identify their personalities and their fit for certain jobs and careers.
- 49% gained confidence in school subjects that interested them.
- 42% recognized what kind of skills they have.
- 52% developed career ideas for themselves.
- 58% increased values in basic skills, thinking skills, and personality qualities.

In Hancock County, a five-session course was offered to middle school students. A random survey of 46 participants showed that they were working to achieve goals (70%). This survey also demonstrated that the students knew how to develop, implement and obtain their goals. They also saw the benefits of teamwork (76%) and encouraged other members to give their best effort (95%) and wanted other team members to succeed (78%).

Comments from the 600 youth involved in the Chester County *Wild Over Work* program included these:

- "It has opened my eyes to what people go through every day."
- "It's gonna be hard in the future and I need to start working on it now."
- "I'm sure that I will use these skills in the future."
- "This program teaches you how to live on your own."
- "I know that I'm not ready to be on my own, but I need to start preparing and learning how to do these things."

Funding: Smith-Lever; NARETPA Section 1444 and 1445

Scope of Impact: State-specific

5.4 Key Theme: Better Tennessee Parenting

Title: Better Parenting for Tennessee's Most Vulnerable Population

Issue: According to data from the Children's Defense Fund, there were 8,494 substantiated cases of abuse and neglect of Tennessee children in 2002. The number of children in foster care in 2002 was 9,359, and the average length of stay in foster care was 27.7 months. There were 56,682 children in the care of relatives absent their parents in Tennessee in 2002. Most of these were not in foster care, which meant they were receiving limited or no financial assistance. According to US Census 2000 data, there were 61,252 Tennessee grandparents who were responsible for meeting the basic needs of their grandchildren. These figures may include families where one or both of the grandchildren's parents are in the home with them.

What has been done: UT Extension taught parenting classes to parents who were court-ordered to attend because their children had been removed from their homes or in an attempt to prevent removal of the children. Extension Agents worked with 65 parents who were court-ordered to take parenting classes. Classes were usually two hours in length and ranged from six to ten sessions. Approximately 58 people completed the required number of classes. Additionally, one agent reported providing classes to eight grandparents, four of whom were court-ordered, to help them in raising grandchildren.

Impact: Participants in parenting classes reported gains in knowledge in appropriate parenting techniques. Department of Children's Services caseworkers reported that parents were using discipline methods other than spanking, were using more effective communications skills such as listening and "I" messages, were using effective praise with their children, and were teaching their children personal responsibility. In a six-month follow-up that involved approximately 20 participants, many reported that they were still holding family meetings, using "I" messages, and that communication among family members continued to improve. Grandparents reported learning alternative discipline methods to spanking and desiring to have greater involvement with their grandchildren.

Data showing whether or not children were returned to the home or whether they did not have to be removed are not currently available for most participants. However, one agent did learn that 20% of parents in her classes had their children removed prior to taking the classes and approximately 15% of those who completed their parenting plan requirements had their children returned. Using those figures, we would calculate that 13 parents court-ordered to parenting classes may have lost custody of their children prior to taking the classes. Of those, approximately 12 may have completed the required classes. Of those, two may have regained their children based on a 15% average. If those two parents had only one child (which is highly unlikely) and that child were returned to the home, savings to local, state, and federal governments would be $43,400 per year, based on an annual cost of $21,700 for keeping a child in foster care in Tennessee. If the remaining 45 persons who completed the classes retained custody of their

children, annual savings to local, state, and federal governments would be approximately $976,500 based on one child per parent.

Funding: Smith-Lever

Scope of Impact: State-specific

Title: Tennessee Parenting Apart: Effective Co-Parenting

Issue: Researchers have found that parents' divorce can be detrimental to children's well-being and adjustment during childhood and as adults. Children of divorce have been found to have double or greater risk of lifelong emotional or behavioral problems when compared to children whose parents stay married. These problems include greater difficulty forming close personal relationships, higher teen marriage rates, higher cohabitation rates, and higher divorce rates as adults, lower psychological and overall well-being, and lower quality of parent-child relationships. Researchers have found that parents who completed a skills-based education program on parenting children through divorce, in contrast to a comparison group of parents who did not do so, were better able to work with their ex-spouses on difficult child-related issues and were more willing to allow their children to spend time with the other parent and had lower re-litigation rates.

Tennessee's divorce rate was tied for 8th out of 48 units reporting in 2003 (we have been ranked as high as second nationally). The rate of decrease in divorces in almost double the rate of decrease nationally. The Tennessee legislature passed a law in 2000 that requires divorcing parents to attend a minimum of four hours of parent education specifically dealing with parenting through divorce.

What has been done: In 2005, Extension FCS Agents in 62 of Tennessee's 95 counties offered the four-hour class *Parenting Apart: Effective Co-Parenting,* an information and skills-based program that utilizes lecture, class discussion, videos, and handouts to inform parents about the potential effects of divorce on their children and provides them with strategies for minimizing those effects. Approximately 3,300 participants completed the Extension class in 2005. More than 19,000 persons have completed the classes in the last five years.

In 2005, five hours of continuing education inservice training was provided to 72 agents in three training sessions. Also, the participant booklet *Parenting Apart: Effective Co-Parenting* was revised based on responses to class evaluations and input from the co-parenting workgroup.

Impact: End-of-class evaluations from 2,807 individuals of the 3,300 who completed the classes in 2005 reveal the following:

- *Knowledge Increased* – 94% agree the classes helped them understand about the impact of divorce on children, 92% learned about the importance of working together for their

children's best interests, and 91% learned the value of their children having a meaningful relationship with both parents.

- *Attitudes Changed* – There was a reduction in the level of resentment at having to attend the class (measured on a scale of 1 to 5 where 1 means not at all resentful and 5 means very resentful) from a mean of 2.41 at the beginning of the class to 1.75 at the end of the class ($N=2447$, $p<.000$).
- *Skills Were Enhanced* – 92% learned techniques for effective communication with their children and the other parent.
- *Aspirations Were Changed* – 90% indicated they planned to work with the other parent for the sake of their children.

Participants for the follow-up evaluation were selected randomly from all participants who agreed to participate in follow-up evaluation by signing an informed consent form. All consent forms were placed together, and every fourth individual was selected from the stack. This resulted in a sample of 370 persons. We received responses from 115 individuals for a 31% response. Responses could be matched to the participant information from 103 persons. Therefore, our usable responses represented 28% of the survey sample. Participants in the follow-up survey reported a decrease in the following behaviors since completing *Parenting Apart: Effective Co-Parenting* class:

- talking to others about the other parent when angry at the other parent,
- sending messages by the child to the other parent,
- having the child ask the other parent for money,
- asking the child about the other parent, and
- arguing, complaining and yelling in front of the child.

Behaviors that remained unchanged included:

- insulting the other parent in front of the child,
- asking the child to take sides, and
- fighting in front of the child.

Those behaviors that remained unchanged were reported infrequently by participants, so that even though the behaviors decreased overall according to participant reports, the numbers were not sufficient to reach statistical significance. Participants reported no change in level of cooperation from the beginning of the class until the time of the follow-up survey. 73% indicated they had continued to use the printed materials they received in the class. One participant summed up the results of the class this way, "The class (especially the videos shown) made me even more aware of how the divorce affects the children and how to handle talking and communication with them. Also helps me communicate better with the other parent; and I believe the class did wonders for my ex!"

Funding: Smith-Lever and User Fees

Scope of Impact: State-specific

5.5 Key Theme: Child Care

Title: First Steps – A Training Series for New Child Care Teachers and Directors

Issue: Tennessee law mandates all newly hired child care teachers to participate in a two-hour pre-service training within their first 30 days of employment. Similarly, state law requires all newly hired directors to take a four-hour pre-service training. The greatest issues facing the target audience was obtaining timely, local training since they needed to fulfill this pre-service requirement within their first 30 days of employment. The Tennessee Department of Human Services identified UT Extension to develop and to teach a curriculum to facilitate this training need.

What has been done: UT Extension developed a high-quality, unique and educational learning series using the latest in 3-D animation technology, and five different videos and compact discs were authored. The two-hour teacher curriculum comprises of three sections: Ages and stages of development (infants through preschoolers), developmentally appropriate practices and health and safety. The four hour director curriculum includes sections on parent involvement, communication, staff/parent relationships, conflict resolution and interviewing skills. The activities/lessons are very appropriate for the target audience as it focuses on the basics since these are newcomers to the child care profession.

Impact: For the past five years the First Steps Pre-Service program has educated over 50,000 childcare professionals. Results via pre-tests and post-tests show that there was an average knowledge gain of 44% for all participants.

In 2005, UT Extension conducted a three-month follow-up of First Steps participants. Childcare workers were asked about their behavior as it relates to what they learned from First Steps, and 450 completed questionnaires were returned. Reports conclude that:

- 65% of childcare participants feel confident when handling issues related to aggression between two children.
- 77% of childcare participants use “open-ended” questions when interacting with children to help them “think”.
- 79% of childcare participants reported changing the bleach solution they clean their facility with every day, which is what is recommended.
- 84% of childcare directors reported using “collaboration” techniques when resolving conflict as opposed to avoiding conflict.
- 82% of childcare directors reported using suggested communication techniques with “problem parents”.

Funding: Smith-Lever

Scope of Impact: State-specific

Title: Extension Cares for Tennessee Children and Youth

Issue: In 2005, 3,500 child care facilities, registered with the Tennessee Department of Human Services, provided care for approximately 350,000 children across Tennessee. The demand has grown for high quality, competent personnel. To meet this demand, opportunities for education and professional development must be provided. Many Tennessee counties lack local, affordable training options for child care providers. Children in child care may receive up to three meals a day and snacks. Data also reflects that only one in five children eat five servings of fruits and vegetables a day.

What has been done: UT Extension offered 380 workshops to approximately 7,600 child care professionals in 2005. Child care providers were taught through one-on-one consultation, group meetings, health fairs, newsletters and site visits. Group meetings were focused on developmentally-appropriate discipline, classroom management, health and safety and nutrition and food safety.

Impact: A multi-county programming in Upper East Tennessee achieved these outcomes:

- 27 child care providers indicated that they now understand how important it is to be able to be a role model for children as they learn to set and eat at a table.
- 33 child care providers indicated they felt more strongly about helping children improve or learn basic table manners for mealtime at home and at the day care.
- 32 child care providers indicated that they learned as family meals increase, so do high nutrient foods.

In Madison County, 40 child care providers representing six centers were involved in programs to learn how to curtail childhood obesity. End-of-program surveys were completed by 26 individuals. The results were as follows:

- 100% named at least one thing relative to food or physical activity that they planned to do something about at home with their own family.
- 100% named at least one thing relative food or physical activity that they planned to do something about at work.

In McMinn County, participants were asked to complete a questionnaire designed to measure knowledge gained, skills learned, and behavior aspirations. Of the 37 child care providers taught:

- 95% reported an increased knowledge of nutrition, classroom safety, and communication skills.
- 84% will use nonverbal communication to manage challenging classroom behaviors.
- 81% will use discipline strategies appropriate for a child's behavior.
- 73% will work to increase communication with parents.

In Knox County, 286 providers from 32 centers were taught anger management, money management, stress control, weight management, stress, nutrition, and communication skills. Surveys of participants indicate the following:

- 94 child care providers indicated that they learned at least three ways to control anger and cope with stress.
- 36 child care providers indicated that they would work on their family budgets, write financial goals (they did so in the class), and would strive to change their negative spending habits.
- 96 child care providers learned 2 techniques or coping skills to use to manage their stress levels.
- 75 child care providers indicated that they learned a new concept about the food pyramid and would try to consume more plant foods.
- 75 child care providers indicated they would try to practice the communications skills learned especially reflective listening.
- 11 child care providers learned the importance of practicing good lead safety techniques such as having the children wash their hands often and the importance of a good diet.

Funding: Smith-Lever

Scope of Impact: State-specific

5.6 Key Theme: 4-H Youth in Governance: Citizenship and Civic Engagement

Title: Responsible Citizenship

Issue: Adolescent youth are not involved and informed on government and citizenship. Apathy is noted by local school officials as a common problem.

What has been done: 4-H citizenship programs were conducted in over 50 Tennessee counties. Programs were tailored to local assets, needs and situations identified by local advisory committees. Examples included:

Activity Sheets – 600 fifth grade 4-H youth in Knox County completed the objectives on the 4-H citizenship activity sheet.

Honor Clubs – Macon County organized 4-H Honor Club for service projects, including planning and conducting events during the Macon County Fair and raising funds for local charities.

Recycling – In Bledsoe County, the UT Extension Agent made 6,781 contacts in citizenship education programs. Youth service-learning included recycling and litter removal.

Field Trips and Tours – In Sullivan County, a county-wide Citizenship Short Course was developed in collaboration with the Farm Bureau Women. Each 5th grade 4-H Club selected two outstanding citizens to attend. During the tour, 17 county officials explained their role in the county government, and 12 adult volunteer leaders worked with the 41 4-H members to learn

about their county government. In addition, a multi-county 4-H Citizenship Tour of Washington, DC was organized and conducted during for 17 4-H members. They visited their Congressmen and toured the Capitol and Arlington Cemetery among other learning opportunities.

Impact: 4,434 youth were involved in 4-H citizenship programs that targeted short-term outcomes. Intact groups of 4-H youth were randomly selected for post-test only questionnaires, and 1,382 individual youth (31% of total participants) submitted completed questionnaires. The questionnaires were valid and reliable instruments, part of the Tennessee 4-H Life Skills Evaluation System, an online tool to measure and evaluate the outcomes of 4-H youth development programs.

Because of their 4-H citizenship experiences,

- 87% of youth improved their attitude toward service to others.
    - 84% now think citizens should be active in the community
    - 88% now think they can make a difference in their community by helping others.
    - 85% think service to others makes a difference in their lives.
    - 91% think service to others is important.
    - 87% think people working together can help others less fortunate.
- 62% of youth improved their knowledge of responsible citizenship.
    - 64% have learned a lot about the history of this country.
    - 53% have learned about important leaders who contributed to this nation.
    - 67% have learned about their own family's history.
    - 57% understand how community leaders are elected.
    - 67% are now proud of the contributions made by leaders of this country.
- 82% now think that it is important for citizens to vote in elections.

Funding: Smith-Lever

Scope of Impact: State-specific

5.7 Key Theme: 4-H Leadership and Volunteerism

Title: 4-H Builds Stronger Leaders

Issue: Tennessee is the volunteer state, and volunteering is known to produce positive results for society, including bringing the family closer together and helping youth feel good about themselves. Opportunities for leadership prepare youth to be capable and contributing members of society. Becky Nichols, a 4-H alumni and prominent community leader in Bedford County stated, "I can tell if the leader in an organization was a 4-H'er. The ones that were 4-H'ers have better speaking skills and conduct more productive meetings. 4-H alumni are more civic-minded, more aware of community and different groups of people…..they are doers and more caring people."

What has been done: Over 50 Tennessee counties conducted programs with leadership outcomes. The following local efforts are representative of the statewide effort:

Teen Leadership – In Claiborne County, youth-adult partnerships were stressed as volunteer leaders and Extension agents cooperated with 92 4-H members in grades 7-12 to provide leadership for 42 different 4-H clubs for elementary youth.

Elected Leadership –In Hickman County, 64 youth were elected by their follow members to club officer positions during elections held at 4-H club meetings. Afterschool workshops were used to teach the officers how to conduct a club meeting, how to write minutes and keep participation records. The officers various responsibilities included reminding members of meetings, presenting awards, distributing handouts and setting up meeting rooms.

Impact: 208 Tennessee youth were involved leadership programs in which a formal outcome evaluation was conducted of leadership skills. Intact groups of 4-H youth were randomly selected for post-test only questionnaires, and completed questionnaires were obtained from 122 youth (58% of the total program participants). The questionnaire was a valid and reliable instrument, pilot-tested and revised by UT personnel. The questionnaire used a five-part scale (never, rarely, sometimes, often and always) to determine leadership skills after the program. A typical questionnaire item would be phrased "*Because of my 4-H experiences*, I always stick with a job until it is finished and done correctly." The following impacts represent "always" and "often" answers.

Because of their 4-H experiences,

- 62% report that they use enthusiasm to get a group working.
- 90% feel responsible for their actions.
- 61% can lead a discussion.
- 75% are sure of their abilities.
- 75% feel comfortable being a group leader.
- 62% can run a meeting.
- 78% give praise and credit to others for success.
- 80% always stick with a job until it is finished and done correctly.
- 67% give clear directions.

In Marion County, the leadership program focused on the 4-H Youth Fair Board and the Teen Leadership Marion program. Impacts revealed from participant surveys included:

- 35 youth reported improved unity among their various schools and communities.
- 32 youth improved their understanding of leadership roles that exist in the county.
- 35 youth increased their understanding of key leaders in the county and the major problems, opportunities and services in Marion County.
- 33 youth improved their awareness of personal leadership skills and opportunities.

A pre-post test of 21 Teen Leadership Marion participants showed the following:

- An 83% increase in leadership life skills.
- An 81% increase in responsible citizenship life skills, teamwork skills and communication life skills.

Funding: Smith-Lever

Scope of Impact: State specific

5.8 Key Theme: Home Environmental Quality and Safety

Title: Better Indoor Air for Tennessee

Issue: Environmental hazards and indoor air quality may cause allergies, asthma, and health problems associated with radon. The asthma rate nearly doubled between 1980 and 1994. Over thirty-five percent of asthma sufferers are children, making it the most common chronic disease among children today. Regardless of age, allergy suffers may be tested. Some of the allergens that they can be tested for include: dust mites, cat dander, soybeans, grass, etc. Once a child is tested then they are aware of the allergens to avoid. The National Academy of Sciences has determined that radon is estimated to cause from 15,000 to 22,000 lung cancer deaths per year. Radon is second only to cigarette smoking as a cause of lung cancer. In Tennessee, indoor air quality risks include not only radon but also carbon monoxide and mold.

What has been done: The program involved various demonstrations, 4-H club programs, health fairs, newsletters, newspaper articles, radio programs, training for child care providers, group meeting for community leaders and training for school officials. Statewide educational contacts totaled 88,445 for healthy indoor environments.

Evaluation data was obtained from four counties at greatest risk for radon. In Overton County, a radon program and take-home booklets were presented to 1,890 4-H youth. School health officials and public school teachers were targeted in Macon and Giles County; and Giles County Public Housing residents were targeted for a multi-session program. In Lincoln County radon education was delivered at the Summer Parent/Child Day Camps.

Impact: In Macon County, 20 school health officials received training in conducting tests for mold, radon and carbon monoxide in the schools. With a six-month follow-up survey, 60% of the officials had adopted good indoor air quality management practices and tested all of the county's eight schools for mold.

The Lincoln County Radon Awareness program was evaluated by interviewing clients who came to the local Extension office to obtain tests and mitigation information. Outcomes included:

- 25 radon tests were sold in the county this year, and two tests were returned with test results above safe levels ($\geq$4.0 pCi/L).
- 10 clients in Lincoln County gained knowledge of radon mitigation.

In Overton County, the radon summary for short term tests resulted in 14 tests conducted. Six of these tests were at unsafe levels (4.0 pCi/l). UT Extension also retrieved 136 long-term radon test kits from participants (53% of home at unsafe levels). Five citizens gained knowledge of mitigation.

In Giles County, year-end radon summary reports indicate eight short-term test kits were evaluated. Results from the test indicate four of the short term kits showed an unsafe level of radon. Of 93 teachers involved in a UT Extension air quality education program:
- 95% were willing to adopt (pursue) the practice of de-cluttering their homes and classrooms.
- 87% were able to identify radon as one the primary causes of lung cancer.
- 71% were able to define asthma as a chronic disease.

Third-party interviews from Section 08 and Pulaski Housing Authority inspectors revealed impacts from the Closet Economics program (three unannounced housing unit inspections were made). Following the Extension program:
- Three tenants had de-cluttered and cleaned their homes.
- The inspector shared, "There has been a tremendous improvement in these three housing units. The maintenance crew has noticed and commented on the 'big change'. I will not have to deal with evicting these people from their home."
- The session 08 housing authority inspector had documented improvement in four of her tenant homes. Comments from her participants that attended "Closet Economics" included:
    - "The program helped me realize my kids need to be more involved in cleaning the house. I like the 'team' idea".
    - "We need to have a program like that for the kids in the summer."

Funding: Smith-Lever

Scope of Impact: State-specific

5.9 Key Theme: Developing Family Life Skills

Title: Developing Healthy Adolescents

Issue: The teen years pose some of the most difficult challenges for families. Teenagers, dealing with hormone changes and an ever-complex world, may feel that no one can understand their feelings, especially parents. As a result, the teen may feel angry, alone and confused while facing complicated issues about identity, peers, sexual behavior, drinking and drugs.

Parents may be frustrated and angry that the teen seems to no longer respond to parental authority. Methods of discipline that worked well in earlier years may no longer have an effect. And, parents may feel frightened and helpless about the choices their teen is making. In 1990, there were 6,360 Tennessee teens aged 10-17 who were pregnant compared to 5,059 in 2000. Even though we have fewer teen pregnancies, there is a great need to continue to address the teen pregnancy issue. The state ranked eleventh in the nation for teen pregnancies in 2001 and has been in the top ten for the past ten years.

What has been done: UT Extension's Girl Talk Curriculum was designed for mothers and their 9-12 year old daughters to come together in a non-threatening environment to discuss sexuality. In 2005, the curriculum was updated, peer-reviewed, copyrighted and published. Girl Talk train-the-trainer sessions (6 hours) were conducted in various locations across the state reaching 84 professionals.

Impact: In Obion County, 100% of the 13 mothers and daughters enrolled in the Girl Talk classes expressed an increase in the ability to communicate about human reproduction and sexuality.

In Cannon County, 14 mother and daughter participants showed an increase in knowledge of Menstruation, Female Health and Hygiene, Child Sexual Abuse, Self Esteem, Reproduction, Pregnancy and Birth, Parenthood Responsibilities, Sexually Transmitted Diseases and Teen Pregnancy. All participants reported that they feel more comfortable talking about sexuality issues with a guardian/young person. In weeks following the Girl Talk classes, the Extension Agent had four mothers report that they have made a stronger effort to communicate with their daughter and their daughters were talking more with them about sexuality issues.

In Decatur County, 12 mother and daughter participants noted that they are better informed and have learned some new communication skills to use on sex education topics.

In Hancock County, one mother, who married at age 16 and has 3 children stated she learned as much about her body as her daughter. She also used the class to encourage her daughter to attend college and carefully consider marriage after she completed her schooling. Four mothers (100% of participants) reported increased communication with their daughters about developmental and sexual matters.

In Henderson County, 35 youth indicated on an end-of-program questionnaire that it was easier to talk to parents about growing up issues since attending the class. In addition, the 35 parents responded that they felt more comfortable talking about sex with child after attending the class.

Funding: Smith-Lever; NARETPA Section 1444 and 1445; Community Prevention Initiative Grant; TSU Program Enhancement Grant

Scope of Impact: State-specific

IV. Stakeholder Input Process

In FY 2005, the Tennessee Agricultural Research and Extension System continued to implement stakeholder input from the Tennessee Agricultural Experiment Stations' statewide phone interviews of 1,635 randomly selected Tennesseans. Telephone numbers where purchased from Survey Sampling, Inc. In FY 2005, the Tennessee Research and Extension System continued strong programs to address the assessment's findings.

The study found that Tennesseans state that one of the most important services of the Tennessee Agricultural Research and Extension System is the "identification of and recommendations for insect damage to crops, plants and trees." The Tennessee Agricultural Research and Extension System responded by expanding efforts in such areas as Asian Soybean Rust and IPM for grain quality losses.

Input from Extension Advisory Groups

UT and TSU Extension made 10,205 contacts with County Extension Advisory Groups and County Agricultural Committees for advisory purposes. 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. Extension administrators worked with the Advisory Council to create a Strategic Plan for 2006-2010. The plan obtained input from county agricultural committee members and sate leaders.

Input from County Agricultural Committees

In FY 2005, telephone interviews were conducted by the Human Dimensions Lab at the University of Tennessee. These telephone interviews targeted the state's 95 County Agricultural Committees. These Committees were established through state legislation and include county commissioners, farmers and other concerned citizens who serve in an advisory and oversight role for the local Extension office. Members were asked about the top three priorities for Extension programs in the state. Key findings identified these top three priorities:

- Protecting crops and resources from pests and diseases
- Preparing youth for a diverse and demanding future
- Managing and marketing for agricultural profitability

Because the state's county agricultural committees were concerned about protection, the Tennessee Agricultural and Extension System responded by crafting statewide plans during 2005. The State Action Agenda for Agrosecurity and Biosecurity will be implemented each year from 2006 to 2010.

Input from the State's Leaders

100 leaders were identified in agriculture and natural resources, resource development, family and consumer sciences and 4-H youth development. The leaders were asked to complete a questionnaire regarding priorities for Extension programs.

Input from Divorcing Parents

UT Extension specialists and agents revised the participant booklet *Parenting Apart: Effective Co-Parenting* based on responses to class evaluations from participants. In 2005, end-of-class evaluations were obtained and considered from 2,807 of the 3,300 individuals who completed the classes.

Input from the Tennessee Food Safety Task Force

UT Extension formed this task force four years ago to serve in an advisory role while also serving as a liaison for regulatory agencies involved with food processors, the food service industries and academia. In 2005, the group met quarterly with over 70 participants. The group advised that middle school students should be targeted for food safety education. UT Extension coordinated the "Implementing a Dynamic Interdisciplinary Food Safety Curriculum Targeted at Middle School Students" grant from USDA for $583,750 over three years.

Input from County and Regional TN Saves Coalitions

Needs assessment data indicated that a major concern of Tennesseans was the rising debt among young consumers. UT Extension adapted the community-based Tennessee Saves program to the workplace. Tennessee Saves was introduced as a worksite-education program. More than 75 corporations across Tennessee requested information about incorporating the financial education offered into their worksite education programs. A series of posters designed to introduce Tennessee Saves at the worksite has been adopted by several other states.

V. Program Review Process

The program review process established in the FY 2000-2004 Plan of Work was utilized in FY 2005, and this protocol was not altered.

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

Issues of Critical Importance

UT Extension and the UT 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 Impact of the impact has been identified for all programs. All departments in the University of Tennessee Institute of Agriculture (UTIA) have personnel with joint appointments in Research and Extension. Examples of critical issues, found in this FY 2005 report, addressed by multistate, multi-institutional, multi-disciplinary and integrated Research and Extension include:

Multi-Disciplinary	***Multi-Institutional***	***Multistate***	***Integrated Research and Extension***
●Tennessee's Value Added Agriculture (all agriculture and natural resource disciplines) ●Child Care Provider Training (health and safety, nutrition and food safety, health and safety and human development)	●Developing Healthy Adolescents (UT and TSU) ●Master Gardeners Grow Community Pride (UT and TSU) ●Tennessee Agriability (UT and TSU)	●Tennessee Agritourism Initiative (Southern Region) ●Implementation of Soil Erosion Management Tool (Wisconsin)	●Controlling Bacterial Diseases of Tomato in Tennessee ●Tennessee Master Logger Program

Needs of Under-served and Under-represented

Improving Latino Access to Health Care was a multi-institutional, multi-year effort that involves Kentucky State University, University of Kentucky and the University of Tennessee. Programs based in Coffee and Bedford Counties in Tennessee have improved the overall community climate for health care. More health care professionals speak Spanish and more Hispanic residents know how to access health services.

Research and Extension efforts to conduct on-farm demonstrations are successful at contacting limited-resource producers. These producers may see research-based field results in their own community, without having to travel to an Experiment Station. In addition, offering the TSU Extension Third Tuesday programs at the TSU Research and Demonstration Farm has targeted the small-scale and limited resource producer.

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.

Toward Greater Effectiveness and Efficiency
In evaluating the success of these and other activities, UT and TSU Extension and UT Experiment Station find that efforts to offer multi-disciplinary, multi-institutional, integrated and multistate programs have been exemplary in FY 2005. Major indicators of effective and efficient programs include:

- All departments in the University of Tennessee Institute of Agriculture have faculty with joint appointments in Extension and Research.
- The multistate and integrated targets for Smith-Lever funds were exceeded.
- The integrated target for Hatch funds was exceeded.
- Multidisciplinary programs were introduced or continued such as the Tennessee Shapes Up program (nutrition and human development) and the Child Care Provider Training program (health and safety, nutrition and food safety, health/safety and human development).

VII. Multistate Research and Extension Activities

In FY 2005, 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:

Tennessee Agritourism Initiative (Regional)
UT Extension specialists and agents hosted a three-day agritourim conference attended by 284 participants from 11 states.

National Learning Center for Private Forest and Range Landowners (22 states)
UT has coordinated this effort to establish an online learning center. UT coordinates the work of 68 individuals representing 29 institutions.

Latino Health Access Coalition (KY)
This is a multi-year project to improve health care access for the Hispanic populations of rural Tennessee and Kentucky.

Tennessee's Value-Added Agriculture Initiative (KY)
UT Extension partnered with the Kentucky Center for Cooperative Development and University of Kentucky specialists to implement this program which involved 2,900 participants.

Feeder Cattle Marketing Alliances (AL, VA and KY)
This program emphasized Beef Quality Assurance to market truckloads of cattle representing four states. Producers marketing their cattle after this program received $87.5 in additional income.

Education for Horse Owners (MS)
Over 1,000 horse owners were involved in group meetings targeting health and management practices.

Cotton Agronomy and Physiology Research (Regional)
UT researchers cooperate with researchers from 11 cotton-growing states to evaluate 33 new experimental and transgenic cotton varieties.

Forest Stewardship (SC)
The South Carolina Timber Tax Program was offered via satellite by UT and Clemson Extension specialists.

National 4-H Congress (National)/Southern Region 4-H Leader Forum (Regional)
Tennessee Extension 4-H personnel worked cooperatively with national and region-wide Extension personnel in implementing the 2005 National 4-H Congress in Atlanta and the Southern Region 4-H Leader Forum in Eatonton, GA. UT Extension personnel offer workshops, coordinate volunteers and serve on committees in conducting both educational events.

VIII. Integrated Research and Extension Programs

The Integrated Research and Extension programs conducted by UT Experiment Station, UT Extension and the TSU Cooperative Extension Program were in compliance with the AREERA of 1998. An overview of 2005 integrated programs includes:

Irrigation for Humid Regions
Various joint Research and Extension projects were continued and improved during 2005. Demonstrations and field days reached 487 producers and professionals.

Controlling Bacterial Diseases of Tomato in Tennessee
Field trials were conducted that determined an organic control product was effective against bacterial spot and bacterial speck, saving the state's tomato growers $150,000 in 2005.

Tennessee Turfgrass Research Field Days
Research field days highlighted turfgrass research in Tennessee for 235 professionals.

Tennessee Master Logger Program
Research and extension was conducted to determine implementation of best management practices.

Integrated Pest Management in Child-serving Facilities
Through this integrated program, a key impact was that the number of Tennessee school systems using IPM rose by 6%.

IX. Contact Information

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

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X. Attachments Required by AREERA Section 105

Appendix A: Integrated Activities with Hatch Funds

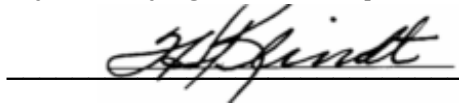
U.S. Department of Agriculture
Cooperative State Research, Education, and Extension Service
Supplement to the Annual Report of Accomplishments and Results
Actual Expenditures of Federal Funding for Multistate Extension and Integrated Activities

Fiscal Year: 2005

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)	$4,511,798				
This FY Target Amount	$1,127,950				
Title of Planned Program Activity					
Competitiveness of Production Systems	$1,088,515				
Promote Sustainable Management	$138,847				
Preserve & Enhance Water Supplies	$5,298				
Total	$1,232,660				
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 27, 2006

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
(Attach Brief Summaries)

Fiscal Year: 2005

Select One: ☐ **Interim** **X Final**
Institution: The 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)			$7,806,024		$7,806,024	
This FY Target Amount			$577,645		$733,766	
Title of Planned Program Activity						
Committees, Workshops, Conferences			$142,292		$747,536	
Projects			$818,822		$2,623,607	
Demonstrations and Field Days			$33,633		$294,191	
Curriculum Development and Training			$298,812		$1,157,474	
Total			$1,293,559		$4,822,808	
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.

N. Charles Gossett — March 27, 2006

Director **Date**

Appendix C: Multistate and Integrated Summary

The following summary provides an overview of Tennessee's FY 2005 Multistate and Integrated Research and Extension programs.

Program/Activity	***Multistate Examples***	***Integrated Examples***
Committees, Meetings, Workshops and Conferences	Southern Region Program Leaders Network (Regional); Southern Region Extension Economic Impacts Work Group (Regional); Southern Region Obesity Impacts Work Group (Regional); Southern Region 4-H Volunteer Leader Conference (Regional); National 4-H Congress (National); Tennessee Agritourism Initiative (Regional); Forest Stewardship (SC)	Irrigation for Humid Regions – Maximizing Economic Return and Minimizing Non-Point Pollution (experiment stations and on-farm demonstrations); Feeder Cattle Marketing Alliances; TN Contributes to National Soil Conservation Tool; Mid-South Center for Native Grassland Management
Projects	Latino Health Access Coalition (KY); Tennessee's Value-Added Agriculture Initiative (KY); Cotton Agronomy and Physiology Research (Cotton-producing states)	Controlling Bacterial Diseases of Tomato in Tennessee; Tennessee's Forage-Mineral Study; Vegetable Initiative Research Team
Demonstrations and Field Days	Feeder Cattle Marketing Alliances (VA, KY and AL); Education for Horse Owners (MS); Tobacco and Alternatives Day (KY)	Tennessee Turfgrass Research Field Days; Making Forages Work Field Day; Tobacco and Alternatives Day; UT Weed Tour
Curriculum Development and Training	National Learning Center for Private Forest and Range Landowners (CO, NY, MN, MT, ND, OR, PA, IN, AK, AZ, AR, GA, KY, ID, NH, WI, UT, VA, WA andWV)	Feeder Cattle Marketing Alliances; Tennessee's Forage-Mineral Study; Dogwood Research Group; Tennessee Master Logger Program